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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG1051** | **Duration** | **3hrs** |
| **Course Title** | **FUNDAMENTALS OF AGRICULTURAL ECONOMICS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | | **BL** | | **M** | |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | | | |
| 1. | Define wealth. | | CO1 | | R | | 1 | |
| 2. | Subject matter of economics. | | CO1 | | U | | 1 | |
| 3. | Differentiate consumption and production. | | CO3 | | A | | 1 | |
| 4. | Define utility. | | CO2 | | U | | 1 | |
| 5. | Differentiate progressive and regressive tax. | | CO5 | | An | | 1 | |
| 6. | Differentiate positive science and normative science. | | CO1 | | A | | 1 | |
| 7. | Define consumer surplus. | | CO2 | | R | | 1 | |
| 8. | Write the formula for income elasticity. | | CO2 | | E | | 1 | |
| 9. | Define good. | | CO3 | | R | | 1 | |
| 10. | What is break-even point? | | CO3 | | U | | 1 | |
| 11. | Explain about the characteristics of perfect market. | | CO3 | | An | | 1 | |
| 12. | When the backward bending supply curve occurs? | | CO3 | | E | | 1 | |
| 13. | Define General equilibrium. | | CO6 | | R | | 1 | |
| 14. | Define Money. | | CO4 | | R | | 1 | |
| 15. | What is Stagflation? | | CO4 | | U | | 1 | |
| 16. | What is a preventive check? | | CO6 | | U | | 1 | |
| 17. | Graphically explain AFC. | | CO3 | | C | | 1 | |
| 18. | Define Bank. | | CO4 | | A | | 1 | |
| 19. | What is GST? | | CO5 | | U | | 1 | |
| 20. | Brief Welfare economics. | | CO6 | | A | | 1 | |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | | | |
| 21. | Explain the importance and role of agriculture in economic development. | | CO1 | | An | | 5 | |
| 22. | Explain indifference curve and its properties with graphical representation. | | CO2 | | R | | 5 | |
| 23. | Differentiate the functions central bank and commercial bank. | | CO4 | | An | | 5 | |
| 24. | Define inflation. Explain different types of inflation. | | CO4 | | A | | 5 | |
| 25. | Define tax. List the types of tax with advantages and disadvantages. | | CO5 | | A | | 5 | |
| 26. | Explain about the functions of entrepreneur. | | CO3 | | A | | 5 | |
| 27. | What are the objectives of economic planning? | | CO1 | | A | | 5 | |
| 28. | Write about Optimum theory of population. | | CO6 | | R | | 5 | |
| 29. | Explain the different cost concepts with graphical representation. | | CO3 | | U | | 5 | |
| 30. | Write the principles of Taxation. | | CO5 | | E | | 5 | |
| 31. | List the functions of money. | | CO4 | | R | | 5 | |
| 32. | Compare Mixed, socialistic and capitalistic economy. | | CO6 | | An | | 5 | |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | | | |
| 33. | a. | Explain the different economic systems with its merits and demerits. | | CO6 | | U | | 7.5 |
|  | b. | Differentiate TPP, MPP and APP along with graph. | | CO3 | | An | | 7.5 |
|  |  |  | |  | |  | |  |
| 34. | a. | Explain the types of elasticity of demand with graphical Representation. | | CO2 | | U | | 7.5 |
|  | b. | Explain in brief about the traditional and modern approach of economics. | | CO1 | | R | | 7.5 |
|  |  |  | |  | |  | |  |
| 35. | a. | Define National income and its concepts. | | CO4 | | U | | 7.5 |
|  | b. | Explain about Good and Service Tax and its components and advantages of GST. | | CO5 | | R | | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the principle and theories, and its role in planning for economic development of the country |
| **CO2** | Remember consumer behaviour - utility maximization problem and demand theory |
| **CO3** | Explain fundamental concepts of agricultural economics, theory of production, theory of cost and |
| **CO4** | output determination across market structures |
| **CO5** | Evaluate different agricultural finance systems and their role as credit agencies |
| **CO6** | Enumerate and discuss different taxes applicable to agriculture |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 8.5 | 1 | 6 | 5 | - | - | 20.5 |
| **CO2** | 6 | 8.5 | - | - | 1 | - | 15.5 |
| **CO3** | 1 | 6 | 6 | 8.5 | 1 | 1 | 23.5 |
| **CO4** | 6 | 8.5 | 6 | 5 | - | - | 25.5 |
| **CO5** | 7.5 | 1 | 5 | 1 | 5 | - | 19.5 |
| **CO6** | 6 | 8.5 | 1 | 5 | - | - | 20.5 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG1101** | **Duration** | **3hrs** |
| **Course Title** | **COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define grapevine communication. | | CO1 | R | 1 |
| 2. | Define functional grammar. | | CO1 | R | 1 |
| 3. | Identify the critical problem for a beginner in public speaking. | | CO1 | U | 1 |
| 4. | Expand SWOT. | | CO1 | R | 1 |
| 5. | State the importance of self-confidence in communication. | | CO2 | R | 1 |
| 6. | Describe impromptu presentation. | | CO5 | R | 1 |
| 7. | Differentiate between a technical article and a popular article. | | CO3 | U | 1 |
| 8. | Identify the four types of personalities seen in human beings. | | CO3 | R | 1 |
| 9. | Cite five examples of non-verbal communication. | | CO3 | U | 1 |
| 10. | Define comprehension. | | CO4 | R | 1 |
| 11. | Explain indexing. | | CO3 | U | 1 |
| 12. | Discuss the advantages of planning. | | CO4 | U | 1 |
| 13. | State any two referencing styles. | | CO5 | R | 1 |
| 14. | Indicate the meaning of ‘Persona’ in Personality Development. | | CO5 | U | 1 |
| 15. | Describe the purpose of a footnote. | | CO6 | U | 1 |
| 16. | Define curriculum vitae. | | CO6 | R | 1 |
| 17. | Noise is a barrier in communication (True/False). | | CO6 | A | 1 |
| 18. | Recall the name describing the process of putting an idea into a code. | | CO2 | U | 1 |
| 19. | State the name describing the communication happening within oneself. | | CO2 | R | 1 |
| 20. | List two methods of note-taking. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain different structures (three main components) in any presentation. | | CO1 | U | 5 |
| 22. | Compare and contrast verbal and non-verbal communication in a tabular format. | | CO2 | U | 5 |
| 23. | Explain techniques for effective speech delivery. | | CO3 | U | 5 |
| 24. | Describe the characteristic features of a good communicator. | | CO4 | U | 5 |
| 25. | Summarize the key aspects of note-taking. | | CO5 | U | 5 |
| 26. | Explain the importance of maintaining a field diary. | | CO6 | U | 5 |
| 27. | Describe decision-making process. | | CO1 | U | 5 |
| 28. | Analyze the Do’s and Don’ts for a candidate in an interview. | | CO2 | An | 5 |
| 29. | Examine different functions of communication. | | CO3 | An | 5 |
| 30. | Summarize different leadership styles. | | CO4 | U | 5 |
| 31. | Discuss methods to improve writing skills. | | CO5 | E | 5 |
| 32. | Describe the significance of keeping a lab record. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain different types of communication with suitable examples. | CO1 | U | 8 |
|  | b. | Evaluate the importance of indexing and summarize its types. | CO2 | E | 7 |
|  |  |  |  |  |  |
| 34. | a. | Analyze different barriers in communication and suggest ways to overcome them. | CO2 | An | 8 |
|  | b. | Elaborate on different note-taking methods. | CO1 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain ERRQ and SQ3R methods of reading. | CO3 | U | 8 |
|  | b. | Evaluate the five stages of group presentation. | CO2 | E | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Apply indexing, footnote and bibliographic procedures |
| **CO2** | Understand the comprehension of articles. |
| **CO3** | Summarize and abstract. |
| **CO4** | Participate and organize group discussions and seminars |
| **CO5** | Develop listening, writing and oral presentation skills |
| **CO6** | Maintain field diary and lab record |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 26 | - | - | - | - | 29 |
| CO2 | 2 | 6 | - | 13 | 14 | - | 35 |
| CO3 | 1 | 16 | - | 5 | - | - | 22 |
| CO4 | 2 | 11 | - | - | - | - | 13 |
| CO5 | 2 | 6 | - | - | 5 | - | 13 |
| CO6 | 1 | 11 | 1 | - | - | - | 13 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG1151** | **Duration** | **3hrs** |
| **Course Title** | **FUNDAMENTALS OF ENTOMOLOGY** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is Physogastry? Give examples. | | CO1 | U | 1 |
| 2. | Abdominal segments is otherwise called as…………………….. | | CO1 | R | 1 |
| 3. | Give an example for Prognathus type of head. | | CO2 | A | 1 |
| 4. | Type of antenna present in butterfly is called …………………….. | | CO2 | R | 1 |
| 5. | Name the type of wing present in thrips. | | CO3 | U | 1 |
| 6. | Basket type of leg is present in ………………….. | | CO2 | U | 1 |
| 7. | Give an example for foreceps like sclerotised cerci. | | CO3 | R | 1 |
| 8. | Last abdominal segments of house fly is modified into …………….. | | CO3 | U | 1 |
| 9. | Pinning region for beetles ………………. | | CO1 | R | 1 |
| 10. | Collection and destruction is …………… type of control measure in IPM. | | CO6 | A | 1 |
| 11. | Aphids belong to the order…………… | | CO3 | R | 1 |
| 12. | Insects have ………………………. type of circulatory system. | | CO4 | R | 1 |
| 13. | The basic unit of nervous system is………………………… | | CO4 | U | 1 |
| 14. | Semipermeable membrane present in insect midgut is called as …………………. | | CO4 | R | 1 |
| 15. | Define Pest. | | CO5 | R | 1 |
| 16. | Larva of mosquito is called as …………………… | | CO3 | R | 1 |
| 17. | Give an example for insect undergo polyembryonic reproduction. | | CO1 | R | 1 |
| 18. | What is collophore? | | CO3 | R | 1 |
| 19. | First abdominal segment fused with metathorax in ants is called as……………. | | CO3 | R | 1 |
| 20. | Dark opaque spot present in the wings of dragonfly is called as………………. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Classify the different types of pests based on its occurrence and level of infestation. | | CO5 | An | 5 |
| 22. | List five different types of leg in insects with example and neat diagrams. | | CO2 | R | 5 |
| 23. | Explain the abdominal appendages in wingless insects. | | CO2 | U | 5 |
| 24. | Distinguish the suborders Homoptera and Heteroptera. | | CO3 | U | 5 |
| 25. | Define moulting and explain the steps involved in moulting. | | CO2 | A | 5 |
| 26. | Analyze the advantage and disadvantages of biological control. | | CO6 | An | 5 |
| 27. | Describe the various types of larva with suitable examples. | | CO2 | R | 5 |
| 28. | Explain the different types of reproduction in insects with examples. | | CO1 | U | 5 |
| 29. | Contrast the suborders of coleoptera. | | CO3 | A | 5 |
| 30. | Analyze the general characters of class Insecta | | CO1 | An | 5 |
| 31. | Classify the types of neurons based on the structure and function in insects. | | CO4 | R | 5 |
| 32. | Draw a neat sketch of insect body wall and write its functions. | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe the reasons for insect dominance. | CO1 | R | 7 |
|  | b. | Explain the structure and function of chewing & lapping type of mouthpart with neat labeled diagram. | CO2 | U | 8 |
|  |  |  |  |  |  |
| 34. | a. | Describe the structure and function of female reproductive system of cockroach with neat labeled diagrams. | CO4 | U | 8 |
|  | b. | Illustrate the structure and function of nervous system in insects. | CO4 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain the taxonomic characters of order Lepidoptera and write briefly about any five families with the economic importance. | CO3 | R | 8 |
|  | b. | Discuss about the general characters of order Diptera and differentiate the sub orders of diptera – Nematocera,Brachycera and Cyclorhapha. | CO3 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| **CO1** | Understand the origin and evolution of Insects. |
| **CO2** | Examine the insect external body parts and their modifications. |
| **CO3** | Identify and classify the insects according to their orders and families. |
| **CO4** | Examine the anatomy of internal organs and their functions. |
| **CO5** | Analyze the factors influencing pest occurrence. |
| **CO6** | Apply the fundamental knowledge on integrated pest management strategies |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 10 | 6 | - | 5 | - | - | 21 |
| **CO2** | 11 | 20 | 6 | - | - | - | 37 |
| **CO3** | 20 | 7 | 5 | - | - | - | 32 |
| **CO4** | 7 | 16 | - | - | - | - | 23 |
| **CO5** | 1 | - | - | 5 | - | - | 06 |
| **CO6** | - | - | 1 | 5 | - | - | 06 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG1303** | **Duration** | **3hrs** |
| **Course Title** | **AGRICULTURAL MICROBIOLOGY** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | List the types of bio-pesticides with examples. | | CO1 | U | 1 |
| 2. | List the major contributions of M.W.Beijerinck to soil Microbiology. | | CO1 | R | 1 |
| 3. | Differentiate nitrogen Mineralization and Immobilization. | | CO1 | R | 1 |
| 4. | Write the importance of assessment of soil enzyme activity. | | CO2 | An | 1 |
| 5. | What is humus? | | CO2 | U | 1 |
| 6. | Define bacterial growth and growth curve. | | CO2 | U | 1 |
| 7. | What is Bioremediation? | | CO3 | R | 1 |
| 8. | What is actinorhizal symbiosis? | | CO3 | R | 1 |
| 9. | List the symbiotic nitrogenese biofertilizer. | | CO3 | U | 1 |
| 10. | What are soil enzymes and their importance in soil fertility? | | CO4 | E | 1 |
| 11. | What is BGA? | | CO4 | U | 1 |
| 12. | What is endophytic microbiomes? | | CO4 | R | 1 |
| 13. | What is carbon Assimilation? | | CO5 | R | 1 |
| 14. | List the micro organisms involved in biofuel production. | | CO5 | U | 1 |
| 15. | Define nitrogen Immobilization. | | CO6 | An | 1 |
| 16. | Define endophytic fungal biofertilizer. | | CO6 | U | 1 |
| 17. | Define conjugation. | | CO6 | R | 1 |
| 18. | List the fungal toxins. | | CO1 | R | 1 |
| 19. | What is the function of mitochondria? | | CO2 | A | 1 |
| 20. | List the phosphate solubilizing organisms. | | CO4 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Draw a neat diagram of bacterial cell and label its parts. | | CO1 | A | 5 |
| 22. | List the types of Bio-pesticides. | | CO2 | U | 5 |
| 23. | Write short notes on Carbon cycle. | | CO3 | U | 5 |
| 24. | Write about transformation and transduction. | | CO4 | U | 5 |
| 25. | Differentiate between chemotrophy and autotrophy. | | CO5 | R | 5 |
| 26. | Differentiate between prokaryotic and eukaryotic cell. | | CO6 | R | 5 |
| 27. | Write short notes on Bio-fuel production. | | CO1 | U | 5 |
| 28. | Differentiate between Rhizosphere and Phyllosphere. | | CO2 | U | 5 |
| 29. | Explain about symbiotic nitrogen fixers. | | CO3 | R | 5 |
| 30. | Write short notes on Mycorrhizae and its types. | | CO4 | A | 5 |
| 31. | Explain about role of microbes in soil fertility. | | CO5 | C | 5 |
| 32. | Explain about microbes that involve in human welfare. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write in detail about Genetic recombination. | CO1 | U | 8 |
|  | b. | Write short notes on Azolla and its mass production. | CO1 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Brief about Biological nitrogen fixation. | CO2 | R | 8 |
|  | b. | Write short notes on silage production. | CO2 | R | 7 |
|  |  |  |  |  |  |
| 35. | a. | Write in detail about different types of nitrogenous Bio-fertilizer. | CO3 | U | 8 |
|  | b. | Describe Bio-degradation of agro-waste. | CO3 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| **CO1** | Comprehend the importance and role of microbes in agricultural production |
| **CO2** | Understand principles of microscopy, sterilization techniques and nutrient media preparation |
| **CO3** | Enumerate microbial load in soil and perform isolation, culturing and purification of microbes |
| **CO4** | Explain the role of microbes in enhancing soil fertility |
| **CO5** | Employ genetic transformation methods using microbes in crop improvement |
| **CO6** | Explore and develop biofertilizers, biopesticides and biofuels |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 2 | 16 | 5 |  |  |  | 23 |
| **CO2** | 15 | 11 |  | 1 |  |  | 27 |
| **CO3** | 2 | 21 |  |  |  |  | 23 |
| **CO4** | 1 | 6 | 5 |  | 1 |  | 13 |
| **CO5** | 6 | 1 |  |  |  | 5 | 12 |
| **CO6** | 6 | 1 |  | 1 |  | 5 | 13 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **21AG1451** | **Duration** | **3hrs** |
| **Course Title** | **INTRODUCTORY SOIL AND WATER CONSERVATION ENGINEERING** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | \_\_\_\_\_\_\_ is the process of removal of soil by the action of water or wind. | | CO1 | R | 1 |
| 2. | The two major types of water erosion are \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | The major factors affecting soil erosion include rainfall, soil type, topography, vegetation, and \_\_\_\_\_\_\_ | | CO1 | U | 1 |
| 4. | A deep and narrow channel formed due to water erosion is called a \_\_\_\_\_\_\_ | | CO2 | R | 1 |
| 5. | Based on their stage of development, gullies are classified as \_\_\_\_\_\_\_ and \_\_\_\_\_\_ | | CO2 | R | 1 |
| 6. | Vegetative methods of gully control include planting \_\_\_\_\_\_\_ to stabilize the soil. | | CO2 | U | 1 |
| 7. | The Universal Soil Loss Equation (USLE) is used to estimate \_\_\_\_\_\_\_ loss from a given area. | | CO3 | U | 1 |
| 8. | The two key factors influencing soil erodibility in USLE are soil texture and \_\_\_\_\_\_\_ | | CO3 | R | 1 |
| 9. | Rainfall erosivity (R-factor) in USLE is determined based on the \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_ of rainfall. | | CO3 | A | 1 |
| 10. | \_\_\_\_\_\_\_ is the collection and storage of rainwater for future use. | | CO4 | R | 1 |
| 11. | Contour bunding helps in reducing soil erosion by reducing the \_\_\_\_\_\_\_ of water flow. | | CO4 | U | 1 |
| 12. | Runoff estimation helps in designing water conservation structures by determining the \_\_\_\_\_\_\_ of excess water. | | CO4 | U | 1 |
| 13. | The three types of soil movement due to wind erosion are \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_ | | CO5 | R | 1 |
| 14. | The critical wind velocity required to initiate soil movement depends on soil texture and \_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 15. | Mechanical wind erosion control measures include \_\_\_\_\_\_\_ barriers and windbreaks. | | CO6 | R | 1 |
| 16. | Shelterbelts reduce wind erosion by decreasing wind \_\_\_\_\_\_\_. | | CO6 | U | 1 |
| 17. | Designing an effective windbreak requires considering factors such as \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_ to optimize wind erosion control. | | CO6 | C | 1 |
| 18. | Sheet erosion removes soil in a uniform layer, whereas \_\_\_\_\_\_\_ erosion creates small channels on the surface | | CO1 | U | 1 |
| 19. | \_\_\_\_\_\_\_ structures are commonly used to slow down water flow and prevent gully formation. | | CO2 | U | 1 |
| 20. | Check dams reduce runoff velocity and promote \_\_\_\_\_\_\_ of water. | | CO4 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the major causes of soil erosion and suggest methods to prevent it. | | CO1 | U | 5 |
| 22. | Describe the classification of gullies and explain different control measures used to prevent gully erosion. | | CO2 | An | 5 |
| 23. | Explain the Universal Soil Loss Equation (USLE) and its application in estimating soil loss. | | CO3 | A | 5 |
| 24. | What are water harvesting techniques? Explain different types used in soil and water conservation | | CO4 | U | 5 |
| 25. | Explain the mechanics of wind erosion and the factors affecting soil movement by wind | | CO5 | An | 5 |
| 26. | What are the different wind erosion control measures? | | CO6 | U | 5 |
| 27. | How does soil erosion impact agricultural productivity, and what measures can be taken to mitigate its effects? | | CO1 | U | 5 |
| 28. | Compare and contrast vegetative and structural methods for controlling gully erosion. | | CO2 | An | 5 |
| 29. | What role does soil texture play in determining soil erodibility? How is it assessed? | | CO3 | A | 5 |
| 30. | Discuss the significance of runoff estimation in designing water conservation structures. | | CO4 | U | 5 |
| 31. | How does climate change influence wind erosion, and what strategies can be used to mitigate its effects? | | CO5 | An | 5 |
| 32. | Design an effective wind erosion control strategy for an agricultural field prone to severe wind erosion. Explain the key factors to consider while implementing the strategy. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the different types of soil erosion, their causes, and the impact on the environment. Also, discuss suitable control measures. | CO1 | U | 8 |
|  | b. | Discuss the importance of soil and water conservation in sustainable agriculture and suggest modern techniques used for conservation. | CO1 | E | 7 |
|  |  |  |  |  |  |
| 34. | a. | What are the different types of gullies? Explain gully erosion control measures in detail. | CO2 | An | 8 |
|  | b. | Explain the role of check dams and retaining walls in gully erosion control. Provide design considerations. | CO2 | A | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain the Universal Soil Loss Equation (USLE) in detail and its applications in soil conservation. | CO3 | A | 7 |
|  | b. | Describe various methods used to estimate soil loss and their significance in conservation planning. | CO3 | E | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | The students will attain the basic concepts of soil and water conservation. |
| **CO2** | To adopt the gully erosion control measures |
| **CO3** | To measure the soil loss using different techniques |
| **CO4** | Explain the water harvesting techniques |
| **CO5** | Understand the mechanics of wind erosion |
| **CO6** | Adapt the different control measures of wind erosion |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 4 | 10 | 0 | 0 | 7 | 0 | 21 |
| **CO2** | 4 | 5 | 7 | 8 | 0 | 0 | 24 |
| **CO3** | 3 | 0 | 8 | 0 | 7 | 0 | 18 |
| **CO4** | 4 | 10 | 7 | 0 | 0 | 0 | 21 |
| **CO5** | 2 | 0 | 0 | 13 | 0 | 0 | 15 |
| **CO6** | 3 | 5 | 0 | 0 | 0 | 7 | 15 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG1503** | **Duration** | **3hrs** |
| **Course Title** | **FUNDAMENTALS OF CROP PHYSIOLOGY** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention three criteria of essentiality. | | CO3 | A | 1 |
| 2. | Define compatible osmolytes with example. | | CO2 | E | 1 |
| 3. | Write the components of Water Potential. | | CO2 | R | 1 |
| 4. | Define: Osmosis. Types of Osmosis. | | CO2 | R | 1 |
| 5. | Define : Hidden hunger. | | CO3 | An | 1 |
| 6. | List the organelles involved in Photorespiration. | | CO1 | U | 1 |
| 7. | Define: Resonance transfer. | | CO4 | A | 1 |
| 8. | Define: Warburg’s effect. | | CO4 | R | 1 |
| 9. | State the role of Carnitane and site of fatty acid metabolism. | | CO4 | An | 1 |
| 10. | Classify stomata based on shape. | | CO4 | R | 1 |
| 11. | Define Emerson’s Enhancement Effect. | | CO4 | U | 1 |
| 12. | Define Photolysis of water. | | CO4 | U | 1 |
| 13. | Define Phosphoroylation and list out the types of phosphorylation. | | CO4 | A | 1 |
| 14. | What is symplast? | | CO4 | U | 1 |
| 15. | Define Respiratory quotient. | | CO4 | R | 1 |
| 16. | Define Vernalization. | | CO5 | R | 1 |
| 17. | Define Seed Germination and list out the phases of Seed germination. | | CO5 | U | 1 |
| 18. | Define photoperiodism and list out the types with an example each. | | CO5 | A | 1 |
| 19. | Write the formula for Crop Growth Rate (CGR) with unit. | | CO5 | An | 1 |
| 20. | List the PGR which have aminoacid as their precursor. | | CO6 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the physiological functions and deficiency symptoms of any five micronutrients. | | CO4 | R | 5 |
| 22. | Draw a neat sketch of Z scheme of light reaction. | | CO4 | R | 5 |
| 23. | Write about Munch’s mass flow on pressure flow hypothesis. | | CO4 | C | 5 |
| 24. | Differentiate between transpiration and Guttation. List out the types of Antitranspirants with examples. | | CO4 | U | 5 |
| 25. | Give a detailed account on Ethylene Inhibitor with example anddifferentiate Climateric and Non Climateric fruits with example. | | CO6 | A | 5 |
| 26. | Give a detailed account on Mechanism of water absorption. | | CO2 | U | 5 |
| 27. | Write stepwise degradation from glucose to pyruvic acid in EMP Pathway and give the Energy budgeting. | | CO4 | R | 5 |
| 28. | Write a note on Physiological effects of cytokinins. | | CO6 | C | 5 |
| 29. | Give a detail note on commercial uses of Growth Regulators. | | CO6 | C | 5 |
| 30. | Write a note on Factors influencing growth. | | CO5 | A | 5 |
| 31. | Explain the Mechanism of Photorespiration and give its significance. | | CO4 | U | 5 |
| 32. | Elaborate the importance of Crop Physiology in Agriculture. | | CO1 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Present C3 cycle schematically. | CO4 | R | 7 |
|  | b. | Write difference between C3 and C4 plants. | CO4 | An | 8 |
|  |  |  |  |  |  |
| 34. | a. | Elaborate the mechanism of water uptake. | CO2 | A | 8 |
|  | b. | Explain the theory of Stomatal opening and closing. | CO2 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Give an account of the physiological roles of GA3. | CO6 | An | 8 |
|  | b. | Write the formula with unit of the following  (i) LAI (ii) SLW (iii) LAD (iv) RGR (v) NAR | CO5 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the physiology of plant tissues and cells |
| CO2 | Remember water movement in plant systems like diffusion and osmosis |
| CO3 | Apply the concept of water relations, mineral uptake in the field of agriculture |
| CO4 | Summarize the various physiological processes |
| CO5 | Measure and analyze the physiological parameters of crops |
| CO6 | Practice the use of growth regulators correctly to solve physiological problems |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  | 1 |  |  |  | 5 | 06 |
| CO2 | 2 | 12 | 8 |  | 1 |  | 23 |
| CO3 |  |  | 1 | 1 |  |  | 02 |
| CO4 | 24 | 13 | 2 | 10 |  | 5 | 54 |
| CO5 | 8 | 1 | 6 | 1 |  |  | 16 |
| CO6 |  |  | 5 | 9 |  | 10 | 24 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2005** | **Duration** | **3 hrs** |
| **Course Title** | **CROP PRODUCTION TECHNOLOGY-II (*RABI* CROPS)** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention the centre of origin of wheat. | | CO1 | U | 1 |
| 2. | What is the period of *rabi* season in India? | | CO1 | R | 1 |
| 3. | Give any two examples of *rabi* cereals. | | CO1 | U | 1 |
| 4. | List the types of chickpea. | | CO2 | R | 1 |
| 5. | What is the temperature requirement of wheat crop? | | CO2 | A | 1 |
| 6. | What is the name of manmade cereal? | | CO2 | R | 1 |
| 7. | List any two byproducts of sugarcane. | | CO3 | R | 1 |
| 8. | What is the name of the phenomenon which leads to bending of sunflower head towards the sunlight? | | CO3 | R | 1 |
| 9. | Name the plant nutrient which directly plays a role in oil content and quality of oilseeds. | | CO3 | R | 1 |
| 10. | Mention the water requirement of sugarcane. | | CO4 | A | 1 |
| 11. | Give the herbicide to control weeds in sugarcane intercropped with greengram. | | CO4 | R | 1 |
| 12. | Detrashing in sugarcane enhances cane yield. Justify. | | CO4 | An | 1 |
| 13. | List any two major states growing mustard in India. | | CO5 | U | 1 |
| 14. | What are all the growth stages of barley? | | CO5 | R | 1 |
| 15. | Mention the objective of nipping in chickpea. | | CO6 | U | 1 |
| 16. | What is the scientific name of lucerne? | | CO6 | R | 1 |
| 17. | Define weed. | | CO6 | R | 1 |
| 18. | Most of the *rabi* crops are not performing well in south India. Why? | | CO2 | An | 1 |
| 19. | Mention the harvest symptom of mustard. | | CO3 | R | 1 |
| 20. | List any two legume tree fodder. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain in detail about importance of cereal crops. | | CO1 | U | 5 |
| 22. | Narrate the soil and climatic requirement of wheat. | | CO1 | E | 5 |
| 23. | Explain the wheat types with their purpose. | | CO2 | R | 5 |
| 24. | Soil and climatic requirement of sunflower. | | CO2 | A | 5 |
| 25. | Discuss the yield parameters of pulses. | | CO3 | R | 5 |
| 26. | Explain the production technologies of mustard. | | CO3 | A | 5 |
| 27. | Narrate the cultivation practices of lemon grass. | | CO4 | E | 5 |
| 28. | Bring out the importance of ratoon cropping in sugarcane. | | CO4 | R | 5 |
| 29. | Intercultural operations in sugarcane are essential practices to get higher yield. Justify. | | CO5 | An | 5 |
| 30. | Give a detailed account on importance of forage crops in agriculture. | | CO5 | U | 5 |
| 31. | Explain the post harvesting techniques of barley. | | CO6 | E | 5 |
| 32. | Suggest the post-harvest techniques to be followed in sunflower crop. | | CO6 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss in detail about weed and water management in wheat. | CO1 | U | 7.5 |
|  | b. | Write the economic importance of sugarcane. | CO1 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Discuss the soil and climatic requirements of pulses and write their economic importance. | CO2 | A | 7.5 |
|  | b. | Write the package of practices of lentils. | CO2 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Suggest the nutrient and water management for sugarcane cultivation. | CO3 | An | 7.5 |
|  | b. | Elaborate the cultivation practices of berseem. | CO3 | An | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Recognize the origin and geographical distribution of major rabi crops |
| **CO2** | Remember soil and climatic requirements of different rabi crop varieties |
| **CO3** | Recall the morphological features and crop production requirements for rabi season crops |
| **CO4** | Review the crop establishment techniques for rabi crops |
| **CO5** | Acquire the knowledge on cultivation and intercultivation practices for rabi season crops |
| **CO6** | Apply the acquired knowledge on harvest and post-harvest techniques of rabi crops |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 1 | 22 |  |  | 5 |  | 28 |
| **CO2** | 7 |  | 21 | 1 |  |  | 29 |
| **CO3** | 9 |  |  | 15 |  |  | 24 |
| **CO4** | 7 |  | 5 | 1 | 5 |  | 18 |
| **CO5** | 1 | 7 |  | 5 |  |  | 13 |
| **CO6** | 2 | 1 |  | 5 | 5 |  | 13 |
| 27 30 31 27 15 | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2009** | **Duration** | **3hrs** |
| **Course Title** | **RAINFED AGRICULTURE & WATERSHED MANAGEMENT** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Dryland Agriculture occupies--------------% of cultivated area. | | CO2 | R | 1 |
| 2. | Generally the size of farm pond is ------- | | CO1 | R | 1 |
| 3. | Amino acid accumulated under moisture stress conditions is---- | | CO1 | U | 1 |
| 4. | Alley cropping is also known as---- | | CO3 | U | 1 |
| 5. | Agri-silvi-pastoral system means--- | | CO4 | A | 1 |
| 6. | Expand AICRPDA. | | CO4 | U | 1 |
| 7. | In India nearly--------m.ha of land is subjected to different land degradations. | | CO3 | R | 1 |
| 8. | Vesicular Arbuscular Mycorrhizae has found to influence yield of several crops by Increasing the uptake. | | CO5 | R | 1 |
| 9. | Cultivation of crops in regions with annual rainfall more than 750 mm is termed as\_\_ | | CO1 | R | 1 |
| 10. | Temporary moisture less condition in soil is called as----- | | CO6 | R | 1 |
| 11. | The condition of deficiency of water due to either insufficient precipitation or excess water loss over supply is termed as | | CO6 | R | 1 |
| 12. | Vertical mulching is very effective in ------- | | CO6 | R | 1 |
| 13. | ICRISAT was established in the year--- | | CO5 | U | 1 |
| 14. | Identify the Land use classification where Arable crops cultivation is possible. | | CO4 | A | 1 |
| 15. | The process of runoff collection during periods of peak rainfall in storage tanks, ponds etc., is known as \_\_ | | CO3 | R | 1 |
| 16. | Presence of deep cracks is seen in-------soils. | | CO1 | U | 1 |
| 17. | --------refers to growing of a suitable crop in place of normally sown highly profitable crop of the region due to aberrant weather conditions. | | CO2 | R | 1 |
| 18. | ---------chemical fill pores and make soil repellent to water. | | CO2 | R | 1 |
| 19. | Moisture availability index was given by\_\_\_\_\_\_ | | CO1 | U | 1 |
| 20. | Prolonged meterological drought is called as---- | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define rainfed agriculture. | | CO1 | R | 5 |
| 22. | Explain Prospects of rainfed agriculture. | | CO2 | A | 5 |
| 23. | Describe the approaches and practices to boosting crop production in drylands. | | CO1 | An | 5 |
| 24. | Describe the characteristics of rainfed agriculture. | | CO3 | R | 5 |
| 25. | Define In-situ soil moisture conservation practice. | | CO3 | E | 5 |
| 26. | Define drought. | | CO3 | R | 5 |
| 27. | What is meant by water harvesting? | | CO5 | An | 5 |
| 28. | Describe the principles of watershed management. | | CO5 | E | 5 |
| 29. | Explain about contingency cropping. | | CO6 | E | 5 |
| 30. | Define conservation bench terracing. | | CO4 | E | 5 |
| 31. | Describe Bench terracing. | | CO3 | U | 5 |
| 32. | What are all the causes of agricultural drought? | | CO4 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Briefly describe the importance of Rainfed Agriculture in India. | CO2 | R | 8 |
|  | b. | Explain the main constraints of rainfed agriculture. | CO4 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Write a note on soil and water conservation techniques. | CO5 | A | 7 |
|  | b. | Classify drought. | CO6 | An | 8 |
|  |  |  |  |  |  |
| 35. | a. | Describe the methods of Water Harvesting. | CO6 | E | 7 |
|  | b. | Describe the components of watershed management program. | CO3 | A | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand sustainable agriculture practices under rainfed conditions |
| **CO2** | Remember soil and climatic conditions of rainfed areas |
| **CO3** | Explain the various crop management techniques and the adaptation strategies for dry land agriculture |
| **CO4** | Formulate contingent water planning for aberrant weather conditions |
| **CO5** | Apply knowledge of different water conservation methods and effective water utilization through use of watershed management |
| **CO6** | Simulate artificial hydrologic watersheds and manage the watersheds effectively |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 7 |  |  |  |  |  | 15 |
| **CO2** | 11 |  | 5 |  |  |  | 16 |
| **CO3** | 12 | 6 | 8 |  | 5 |  | 31 |
| **CO4** | 5 | 9 | 2 |  | 5 |  | 21 |
| **CO5** | 1 | 1 | 7 | 13 | 5 |  | 27 |
| **CO6** | 3 |  |  |  | 12 |  | 15 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2011** | **Duration** | **3hrs** |
| **Course Title** | **PRINCIPLES OF ORGANIC FARMING** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Vermicompost is manure prepared by--------- | | CO2 | R | 1 |
| 2. | A natural fiber is obtained from stem of its plant and the plant is harvested when its starts flowering. The fiber is-------- | | CO1 | R | 1 |
| 3. | Who is considered the father of modern organic agriculture? | | CO1 | U | 1 |
| 4. | In which year was the international federation of organic agriculture movement (IFOAM) created? | | CO3 | U | 1 |
| 5. | If LER is more than 1.0, it means intercropping is ------- | | CO4 | A | 1 |
| 6. | Which country was the largest organic producer in 2021? | | CO4 | U | 1 |
| 7. | What is the main focus of biodynamic agriculture? | | CO3 | R | 1 |
| 8. | Which state in India became fully organic in 2016? | | CO5 | R | 1 |
| 9. | What is the primary purpose of organic certification? | | CO1 | R | 1 |
| 10. | What is the main goal of Codex Alimentariu’s definition of organic agriculture? | | CO6 | R | 1 |
| 11. | NPOP stand for----- | | CO6 | R | 1 |
| 12. | Organic manures are---- | | CO6 | R | 1 |
| 13. | Undecomposed plant material used as manure is called as---- | | CO5 | U | 1 |
| 14. | NADEP is a method of ----- | | CO4 | A | 1 |
| 15. | Biofertilizer means---. | | CO3 | R | 1 |
| 16. | What is mean by botanical pesticides---- | | CO1 | U | 1 |
| 17. | Tricograma chilonis is example of ----type of bio agent. | | CO2 | R | 1 |
| 18. | What is stale seedbed? | | CO2 | R | 1 |
| 19. | What does IFOAM’s definition of organic agriculture emphasize? | | CO1 | U | 1 |
| 20. | What is the main principle behind zero budget natural farming (ZBNF)? | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What is organic farming? | | CO1 | R | 5 |
| 22. | **Why super phosphate is added in the compost?** | | CO2 | A | 5 |
| 23. | **How do organic farmers fertilize crops and control pests, diseases, and weeds?** | | CO1 | An | 5 |
| 24. | **How are organic livestock and poultry raised?** | | CO3 | R | 5 |
| 25. | **What is composting?** | | CO3 | E | 5 |
| 26. | **How does compost improve the soil?** | | CO3 | R | 5 |
| 27. | What is natural farming? | | CO5 | An | 5 |
| 28. | Is organic food more nutritious than conventional food? | | CO5 | E | 5 |
| 29. | How does a farmer go about converting land to organic status? | | CO6 | E | 5 |
| 30. | How organic farming is different from conventional farming? | | CO4 | E | 5 |
| 31. | **What is Vermiculture?** | | CO3 | R | 5 |
| 32. | **What is green manuring?** | | CO4 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Whether the conversion to organic agriculture will have any adverse impact on the food security in India? Explain. | CO2 | R | 8 |
|  | b. | Is organic farming advantageous for small and marginal farmers and rainfed areas? Explain. | CO4 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Explain Organic ecosystem and their concepts. | CO5 | A | 7 |
|  | b. | Briefly discuss about the different methods of composting. | CO6 | An | 8 |
|  |  |  |  |  |  |
| 35. | a. | Explain the nutritional aspect of organic produce. | CO6 | E | 7 |
|  | b. | Define biodiversity. Mention the types of biodiversity and brief about the conservation strategies. | CO3 | An | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M –** MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Remember the concepts of organic farming |
| CO2 | Understand the crop management practices and technologies of various crops |
| CO3 | Recall the different cropping systems of Tamil Nadu |
| CO4 | Compare the organic crop production with inorganic crop production |
| CO5 | Apply the knowledge of standards and certification process of organic produce |
| CO6 | Analyze different marketing strategies of organic farm products |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / BL | R | U | A | An | E | C | Total |
| CO1 | 7 | 3 |  | 5 |  |  | 15 |
| CO2 | 11 |  | 5 |  |  |  | 16 |
| CO3 | 17 | 1 |  | 8 | 5 |  | 31 |
| CO4 | 5 | 9 | 2 |  | 5 |  | 21 |
| CO5 | 1 | 1 | 7 | 13 | 5 |  | 27 |
| CO6 | 3 |  |  |  | 12 |  | 15 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **21AG2053** | **Duration** | **3hrs** |
| **Course Title** | **AGRICULTURAL MARKETING TRADE & PRICES** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Agricultural Marketing | | CO2 | U | 1 |
| 2. | Discuss Market structure. | | CO3 | R | 1 |
| 3. | Describe about Uzhavar Sandies. | | CO3 | U | 1 |
| 4. | Write about marketing channel. | | CO3 | R | 1 |
| 5. | Define Market promotion. | | CO3 | R | 1 |
| 6. | Define Trade. | | CO4 | R | 1 |
| 7. | List the components of a Market. | | CO4 | U | 1 |
| 8. | Discuss CACP. | | CO5 | U | 1 |
| 9. | Expand and describe TRIFED. | | CO2 | R | 1 |
| 10. | Describe Product Life Cycle. | | CO1 | U | 1 |
| 11. | Expand and describe AGMARK. | | CO2 | R | 1 |
| 12. | Define Marketing Efficiency. | | CO2 | U | 1 |
| 13. | Expand and describe NAFED. | | CO3 | R | 1 |
| 14. | Write any two objectives of Food Corporation of India (FCI). | | CO1 | U | 1 |
| 15. | Expand and describe TRIPS. | | CO2 | R | 1 |
| 16. | State the importance of Agricultural Marketing. | | CO3 | U | 1 |
| 17. | Expand and describe TANFED. | | CO3 | U | 1 |
| 18. | Expand FSSAI, ISI and BIS. | | CO2 | R | 1 |
| 19. | Define Contract Marketing. | | CO5 | U | 1 |
| 20. | Define Price spread. | | CO3 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Compare the different types of producer's surplus and identify factors affecting marketable surplus. | | CO1 | R | 5 |
| 22. | Describe the various types of marketing channels with suitable examples. | | CO1 | R | 5 |
| 23. | Write a short note on factors affecting the cost of marketing. | | CO5 | R | 5 |
| 24. | Compare the different types of market integration. | | CO1 | U | 5 |
| 25. | Enumerate the various types and functions of co-operative marketing. | | CO4 | R | 5 |
| 26. | Classify the different types of warehouses. | | CO3 | U | 5 |
| 27. | Describe about Pricing and promotion strategies. | | CO5 | R | 5 |
| 28. | Narrate the role of Govt. in agricultural marketing. | | CO3 | R | 5 |
| 29. | Expand and describe the activities of NCDC. | | CO4 | U | 5 |
| 30. | Identify the strategies in different stages of PLC. | | CO4 | R | 5 |
| 31. | Illustrate the types and importance of agencies involved in agricultural marketing. | | CO5 | U | 5 |
| 32. | List and describe the advantages of international trades. | | CO2 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Classify the different classification of markets. | CO1 | A | 7.5 |
|  | b. | Describe the marketing functions and their classification. | CO2 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Interpret the different types of risk in marketing. Explain nature and sources of risks and its management strategies. | CO4 | A | 7.5 |
|  | b. | Elaborate the public sector institutions- CWC, SWC, FCI, CACP & DMI – their objectives and functions. | CO3 | U | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain in detail the present status and prospects of international trade in agri-commodities. | CO5 | U | 7.5 |
|  | b. | Summarize the GATT and WTO; Agreement on Agriculture (AoA) and its implications on Indian agriculture. | CO6 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Know the contours of agricultural market ecosystem, different market structures and their functions. |
| **CO2** | Analyze the demand and supply problems in agricultural marketing systems, marketing efficiency and policies |
| **CO3** | Demonstrate the methods of valuation of farm assets |
| **CO4** | Understand the food supply chain and its actors and activities |
| **CO5** | Gain practical skills on dealing with marketing institutions and warehouses |
| **CO6** | Understand international trade arrangements under WTO, Agreement on Agriculture (AOA) and EXIM policies |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2055** | **Duration** | **3hrs** |
| **Course Name** | **FARM MANAGEMENT, PRODUCTION & RESOURCE**  **ECONOMICS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define farm. | | CO1 | U | 1 |
| 2. | List the factors of production. | | CO1 | R | 1 |
| 3. | Differentiate between the flow resource and stock resource. | | CO1 | An | 1 |
| 4. | Expand CACP. | | CO2 | U | 1 |
| 5. | Define Isoquant. | | CO2 | R | 1 |
| 6. | List the three types of production function. | | CO2 | A | 1 |
| 7. | If the TPP is Maximum, then what about MPP? | | CO3 | An | 1 |
| 8. | Differentiate short run and long run production function. | | CO3 | An | 1 |
| 9. | Express the formula for Farm Business Income. | | CO3 | R | 1 |
| 10. | Define opportunity cost. | | CO4 | R | 1 |
| 11. | The relationship between input and output is \_\_\_\_\_\_\_\_\_\_ | | CO4 | A | 1 |
| 12. | Write about total cost. | | CO4 | U | 1 |
| 13. | Write about farm accounting. | | CO5 | C | 1 |
| 14. | Define product. | | CO5 | R | 1 |
| 15. | Explain common property rights. | | CO6 | A | 1 |
| 16. | List the three financial statements to check the feasibility. | | CO6 | E | 1 |
| 17. | List the dimensions of natural resource economics. | | CO6 | R | 1 |
| 18. | Brief ranching. | | CO1 | U | 1 |
| 19. | Draw the breakeven point along with formula. | | CO2 | An | 1 |
| 20. | Differentiate COC and COP. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the characteristics of farming as a business. | | CO1 | U | 5 |
| 22. | Explain the types of farming. | | CO2 | R | 5 |
| 23. | Describe any three insurance scheme. | | CO3 | E | 5 |
| 24. | Brief about linear programming. | | CO4 | R | 5 |
| 25. | List the farm record and its types in brief. | | CO5 | An | 5 |
| 26. | Enumerate the cost concepts about CACP. | | CO6 | A | 5 |
| 27. | Differentiate Agricultural production function and Farm management. | | CO1 | U | 5 |
| 28. | Explain the Least cost combination. | | CO2 | An | 5 |
| 29. | Interpret the farm records available in the farm. | | CO3 | E | 5 |
| 30. | List the types of farm budgeting. | | CO4 | A | 5 |
| 31. | Summarize the issues of Natural resource economics. | | CO5 | An | 5 |
| 32. | Explain the methods of determining the optimum amount of input and output. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the sources of risk and uncertainty. | CO3 | R | 7.5 |
|  | b. | Explain the system of farming. | CO1 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Explain the three stages of production function. | CO2 | An | 7.5 |
|  | b. | Describe the characteristics of good farm plan. | CO4 | E | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write about Pradhan Mantri Fasal Bima Yojana. | CO6 | R | 7.5 |
|  | b. | Describe externalities and its types. | CO5 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the principle and theories, and its role in planning for economic development of the country |
| **CO2** | Remember consumer behaviour - utility maximization problem and demand theory |
| **CO3** | Explain fundamental concepts of agricultural economics, theory of production, theory of cost and |
| **CO4** | output determination across market structures |
| **CO5** | Evaluate different agricultural finance systems and their role as credit agencies |
| **CO6** | Enumerate and discuss different taxes applicable to agriculture |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 19.5 | 1 | - | 1 | - | - | 21.5 |
| **CO2** | 1 | 6 | 1 | 13.5 | - | - | 21.5 |
| **CO3** | - | 8.5 | - | 2 | 10 | - | 20.5 |
| **CO4** | 1 | 7 | 6 | - | 7.5 | - | 21.5 |
| **CO5** | - | 1 | 7.5 | 10 | - | 1 | 19.5 |
| **CO6** | - | 13.5 | 6 | - | 1 | - | 20.5 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2103** | **Duration** | **3hrs** |
| **Course Title** | **FUNDAMENTALS OF AGRICULTURAL EXTENSION EDUCATION** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is Extension Education? | | CO1 | R | 1 |
| 2. | Who initiate Marthandam Project? Mention its objective. | | CO1 | U | 1 |
| 3. | What is T&V system? Who initiate the T&V System? | | CO1 | R | 1 |
| 4. | Explain the concept of Market-led Extension. | | CO2 | U | 1 |
| 5. | List the types of Education. | | CO2 | R | 1 |
| 6. | Define Cyber Extension and explain the role of Cyber Extension in agriculture/education. | | CO2 | U | 1 |
| 7. | List any two barriers of communication. | | CO3 | U | 1 |
| 8. | Define Monitoring. | | CO3 | R | 1 |
| 9. | What is KCC ? Mention the KCC toll free number. | | CO3 | U | 1 |
| 10. | Define and explain the importance of Rural Development. | | CO4 | U | 1 |
| 11. | What is Programme Planning, and why is it important in Extension Education? | | CO4 | U | 1 |
| 12. | Who initiate Nilokheri Project? When it was started? | | CO4 | R | 1 |
| 13. | Expand ARYA. | | CO5 | R | 1 |
| 14. | What is FTC? | | CO5 | R | 1 |
| 15. | Expand HYVP. | | CO6 | R | 1 |
| 16. | Define Community Development Programme. | | CO6 | R | 1 |
| 17. | Explain IADP programme. | | CO6 | R | 1 |
| 18. | Analyze how Multimedia can enhance the effectiveness of communication in rural development programs. | | CO1 | A | 1 |
| 19. | Expand PTD and FSRE. | | CO2 | R | 1 |
| 20. | Define communication. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | List and explain the Principles of Extension Education. | | CO1 | R | 5 |
| 22. | Analyze the extension efforts in the pre-independence era and their impact on agricultural development. | | CO2 | A | 5 |
| 23. | Using PRA techniques, how would you assess the needs of a rural community? | | CO3 | A | 5 |
| 24. | Explain in detail the Community Development Programme and its objectives. | | CO4 | U | 5 |
| 25. | Describe what training is, and explain the steps involved in conducting a training program. | | CO5 | U | 5 |
| 26. | Explain the effectiveness of ICAR’s extension development programs in improving agricultural practices. | | CO6 | E | 5 |
| 27. | What is Panchayat Raj? Recall the three-tier Panchayat Raj system and explain briefly. | | CO1 | R | 5 |
| 28. | Describe the steps in program planning in the context of agricultural extension. | | CO2 | U | 5 |
| 29. | Analyze the role of each component of POSDCORB in improving the efficiency and effectiveness of agricultural extension administration. | | CO3 | A | 5 |
| 30. | Compare and contrast Method and Result Demonstrations, explaining their roles in agricultural extension. | | CO4 | A | 5 |
| 31. | Recall the stages of adoption in the context of agricultural innovation. | | CO5 | R | 5 |
| 32. | Propose an innovative expert system for improving agriculture practices and describe its potential application. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What is communication? Narrate any 5 communication models. | CO1 | R | 10 |
|  | b. | Explain the role and importance of each element in the communication process. | CO1 | U | 5 |
|  |  |  |  |  |  |
| 34. | a. | What is innovation? List and explain the elements of diffusion and attributes of innovation. | CO2 | R | 10 |
|  | b. | Explain what adoption means and describe the characteristics of each adopter category. | CO2 | U | 5 |
|  |  |  |  |  |  |
| 35. | a. | What is KVK? How can the mandates and activities of KVKs be applied to solve specific agricultural challenges in rural areas? | CO3 | A | 7.5 |
|  | b. | Evaluate the effectiveness of the Individual Contact Method in promoting the adoption of agricultural innovations. | CO3 | E | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand agricultural extension and rural development programs |
| **CO2** | Create employment. Opportunity based on the knowledge gained on different schemes operated by state and central government. |
| **CO3** | Remember the new innovations in the area of agricultural extension in India. |
| **CO4** | Apply the practical knowledge gained on technology transfer from lab to land. |
| **CO5** | Create awareness among farmers on different communication technology and journals available for scientific farming. |
| **CO6** | Apply the knowledge for uplifting poor and marginal farmers. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 22 | 6 | 1 | - | - | - | 29 |
| **CO2** | 12 | 12 | 5 | - | - | - | 29 |
| **CO3** | 1 | 2 | 17.5 | - | 7.5 | - | 28 |
| **CO4** | 2 | 7 | 5 | - | - | - | 14 |
| **CO5** | 7 | 5 | - | - | - | - | 12 |
| **CO6** | 3 | - | - | - | 5 | 5 | 13 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2153** | **Duration** | **3hrs** |
| **Course Title** | **MANAGEMENT OF BENEFICIAL INSECTS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Scientific name of Indian bee is…………. | | CO1 | R | 1 |
| 2. | Tukra disease is caused by ……………. | | CO5 | R | 1 |
| 3. | Expand: CSRTI | | CO1 | R | 1 |
| 4. | Cultivation of Eri silkworm is called……. | | CO3 | U | 1 |
| 5. | Honey bee belongs to the order …………….. | | CO1 | R | 1 |
| 6. | Honey bee species that cannot be domesticated is called …………… | | CO1 | An | 1 |
| 7. | Commercial product of lac is …………….. | | CO1 | U | 1 |
| 8. | Parthenium weed is controlled by …………………….. | | CO2 | R | 1 |
| 9. | Scientific name of Varroa mite is ………….. | | CO5 | R | 1 |
| 10. | Expand DFL. | | CO1 | R | 1 |
| 11. | *Spalgis epius* the predator of mealy bugs belong to the family ………………….. | | CO6 | U | 1 |
| 12. | Queen substance is secreted from…………….. gland of queen bee. | | CO3 | U | 1 |
| 13. | Poor man’s silk is ……………. | | CO1 | A | 1 |
| 14. | The process of killing of pupae of silkworm in the cocoon is called ………. | | CO3 | An | 1 |
| 15. | Parasitoid used for the management of sugarcane internode borer is ……………….. | | CO6 | R | 1 |
| 16. | *Ophiomyia lantanae* is an insect is considered as ………………….. | | CO2 | U | 1 |
| 17. | Type of leg present in honey bee is ……………….. | | CO1 | An | 1 |
| 18. | Preying their own species in insect is called as ………………………… | | CO2 | U | 1 |
| 19. | Nosema disease is caused by……………….. | | CO5 | R | 1 |
| 20. | Bee dance was discovered by …………………. | | CO1 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the leg modifications of honey bee with neat diagrams. | | CO1 | R | 5 |
| 22. | Describe the five different species of honey bee. | | CO1 | R | 5 |
| 23. | List the various uses of shellac. | | CO6 | A | 5 |
| 24. | Describe the silkworm rearing equipment with neat diagrams. | | CO3 | A | 5 |
| 25. | Give a detailed account on role of insect pollinators in cross pollination. | | CO2 | U | 5 |
| 26. | Write about the bee products and its medicinal value. | | CO6 | An | 5 |
| 27. | Enumerate the pests of silkworm and its management. | | CO5 | A | 5 |
| 28. | Explain the types of pruning in mulberry. | | CO3 | U | 5 |
| 29. | List the five families of parasitoids in order hymenoptera with their characters. | | CO3 | R | 5 |
| 30. | Differentiate the parasitoids and predators with important characters. | | CO4 | An | 5 |
| 31. | Explain about the non-mulberry silkworm. | | CO1 | R | 5 |
| 32. | Describe the defective cocoons during silkworm rearing. | | CO6 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain in detail about culturing of lac insects, processing and lac products. | CO1 | U | 8 |
|  | b. | Describe the insect pests and diseases of honey bee. | CO5 | R | 7 |
|  |  |  |  |  |  |
| 34. | a. | Elaborate on three different castes of honey bee and their role in bee hive. | CO1 | U | 8 |
|  | b. | List and explain the mulberry varieties suitable for various conditions and types of planting methods. | CO3 | An | 7 |
|  |  |  |  |  |  |
| 35. | a. | Demonstrate the Chawki rearing method. | CO3 | U | 5 |
|  | b. | Brief about the insect scavengers and soil builders. | CO2 | R | 5 |
|  | c. | List the insect predators of agricultural importance with suitable examples. | CO2 | A | 5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Identify species of honeybees, silkworms and lac insect and their host plants, recall equipment and practices |
| **CO2** | Explain the role of beneficial insects viz., pollinators, scavengers, soil builders and biological control agents. |
| **CO3** | Demonstrate beekeeping, silkworm rearing and mass multiplication of biocontrol agents. |
| **CO4** | Evaluate the seasonal management practices of beneficial insects. |
| **CO5** | Analyze the effectiveness of different pest and disease management strategies in beekeeping, sericulture and lac culture. |
| **CO6** | Develop sustainable models for insect based industries and eco-friendly pest control. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 20 | 17 | 1 | 2 | - | - | 40 |
| **CO2** | 6 | 7 | 5 | - | - | - | 18 |
| **CO3** | 5 | 12 | 5 | 8 | - | - | 30 |
| **CO4** | - | - | - | 5 | - | - | 05 |
| **CO5** | 10 | - | 05 | - | - | - | 15 |
| **CO6** | 1 | 1 | 5 | 10 | - | - | 17 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2203** | **Duration** | **3hrs** |
| **Course Title** | **PRINCIPLES OF SEED TECHNOLOGY** | **Max. Marks** | **100** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | | **BL** | | **M** | |
| **PART - A (20 X 1 = 20 MARKS)** | | | | | | | | |
| 1. | Write the importance of seeds. | | CO1 | | U | | 1 | |
| 2. | Define dichogamy. List its types with examples. | | CO1 | | R | | 1 | |
| 3. | What are all the causes of varietal deterioration? | | CO1 | | R | | 1 | |
| 4. | Write about breeder seed. | | CO2 | | U | | 1 | |
| 5. | What is field count? How many numbers of counts are needed for 13 acres. | | CO2 | | An | | 1 | |
| 6. | List the types of maize hybrids. | | CO2 | | R | | 1 | |
| 7. | What is emasculation and in which crop it is widely practiced? | | CO3 | | U | | 1 | |
| 8. | Write about central seed testing laboratory? Write the location of two CSTL in India. | | CO3 | | R | | 1 | |
| 9. | What are all the objectives of Seeds Bill, 2004? | | CO3 | | R | | 1 | |
| 10. | What is GM Crops? | | CO4 | | R | | 1 | |
| 11. | Write about organic seed certification. | | CO4 | | U | | 1 | |
| 12. | Define seed dormancy. | | CO4 | | R | | 1 | |
| 13. | List the different packing materials. | | CO5 | | U | | 1 | |
| 14. | What are all the sanitation measures to be taken in a seed storage godown? | | CO5 | | U | | 1 | |
| 15. | List the types of seed storage. | | CO6 | | R | | 1 | |
| 16. | Write about the types of seed distribution systems in India. | | CO6 | | R | | 1 | |
| 17. | What are all the Seed Certification schemes available under OECD? | | CO6 | | R | | 1 | |
| 18. | Define Seed. | | CO1 | | U | | 1 | |
| 19. | List the different classes of seeds in order. | | CO2 | | U | | 1 | |
| 20. | What is physiological maturity? | | CO4 | | U | | 1 | |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | | | |
| 21. | Explain genetic principles of seed production. | | CO1 | | R | | 5 | |
| 22. | Define Seed Certification. Write the phases of seed certification. | | CO2 | | U | | 5 | |
| 23. | Explain the duties and powers of seed inspectors. | | CO3 | | U | | 5 | |
| 24. | Write in detail about organic seed production techniques. | | CO4 | | U | | 5 | |
| 25. | Write short note on factors affecting seed storage. | | CO5 | | U | | 5 | |
| 26. | Explain the benefits of participatory seed production. | | CO6 | | R | | 5 | |
| 27. | Describe the causes of varietal deterioration. | | CO1 | | R | | 5 | |
| 28. | Briefly discuss the generation system of seed multiplication. | | CO2 | | U | | 5 | |
| 29. | Give details on Seed production techniques of Sunflower. | | CO3 | | R | | 5 | |
| 30. | Write in detail the detection methods for genetically modified crops. | | CO4 | | R | | 5 | |
| 31. | What is seed drying? Write the importance and principles of seed drying. | | CO5 | | U | | 5 | |
| 32. | Write a note on factors affecting seed marketing. | | CO6 | | U | | 5 | |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | | | |
| 33. | a. | Differentiate between seed production and crop production. | | CO1 | | U | | 7.5 |
|  | b. | Give a detailed note on internal and external structures of seeds. | | CO1 | | U | | 7.5 |
|  |  |  | |  | |  | |  |
| 34. | a. | Discuss the seed production techniques of rice. | | CO2 | | R | | 7.5 |
|  | b. | Explain seed production techniques of pigeon pea. | | CO2 | | R | | 7.5 |
|  |  |  | |  | |  | |  |
| 35. | a. | Briefly explain the seed control order, 1983. | | CO3 | | R | | 7.5 |
|  | b. | Explain in detail highlights of the Seeds Bill, 2004. | | CO3 | | R | | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the importance of seed technology in agriculture |
| **CO2** | Students acquire knowledge on structure and composition of seeds |
| **CO3** | Understand the seed quality and its evaluation pattern for good quality seeds |
| **CO4** | Develop strategies for seed storage and preservation |
| **CO5** | Gain knowledge on seed processing equipment |
| **CO6** | Acquire knowledge on post-harvest handling of seed crops |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 12 | 17 |  |  |  |  | 29 |
| **CO2** | 16 | 12 |  | 1 |  |  | 29 |
| **CO3** | 14.5 | 13.5 |  |  |  |  | 28 |
| **CO4** | 7 | 7 |  |  |  |  | 14 |
| **CO5** |  | 12 |  |  |  |  | 12 |
| **CO6** | 8 | 5 |  |  |  |  | 13 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2305** | **Duration** | **3hrs** |
| **Course Title** | **RENEWABLE ENERGY AND GREEN TECHNOLOGY** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Solar photovoltaic system operates on the basis of ………. | | CO1 | U | 1 |
| 2. | 1m3 of biogas generate electricity of---------------- | | CO4 | R | 1 |
| 3. | Demand for fuel and products is caused due to-------------- | | CO4 | U | 1 |
| 4. | If the pH range is between 4 and 6 it is called ………….. | | CO5 | R | 1 |
| 5. | ………. device is used to measure the wind speed. | | CO6 | R | 1 |
| 6. | Plants absorb the sun's energy in a process called …………. | | CO1 | U | 1 |
| 7. | Direct Solar radiation is known as……….. | | CO2 | R | 1 |
| 8. | Biogas, a mixture containing ………. % of methane. | | CO4 | An | 1 |
| 9. | Particle Size of Slow Pyrolysis……….. | | CO3 | R | 1 |
| 10. | List the types of Biogas Plant. | | CO4 | R | 1 |
| 11. | List five examples of Renewable Energy Sources. | | CO3 | R | 1 |
| 12. | Mention the byproducts utilization of biodiesel production. | | CO3 | U | 1 |
| 13. | Define Energy Crisis. | | CO1 | R | 1 |
| 14. | Define Geothermal Energy. | | CO6 | R | 1 |
| 15. | Write the Composition of Biogas. | | CO4 | R | 1 |
| 16. | Write about bio digested slurry. | | CO4 | U | 1 |
| 17. | Differentiate Renewable and Non Renewable Energy. | | CO2 | A | 1 |
| 18. | State Biomass. | | CO5 | R | 1 |
| 19. | Define Transesterification. | | CO5 | R | 1 |
| 20. | Define gasification. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write about Biochemical Conversion. | | CO1 | U | 5 |
| 22. | Compare slow and fast pyrolysis. | | CO4 | A | 5 |
| 23. | Explain about Tunnel type Solar dryer. | | CO2 | U | 5 |
| 24. | Describe the three stages of anaerobic digestion. | | CO4 | U | 5 |
| 25. | Classify the Energy Sources. | | CO3 | U | 5 |
| 26. | Explain Thermochemical Conversion. | | CO1 | U | 5 |
| 27. | Write in detail about Tidal Energy. | | CO5 | U | 5 |
| 28. | Give a sketch of Deenbhandhu Biogas Plant with its components. | | CO4 | U | 5 |
| 29. | List the uses of Windmill. | | CO6 | U | 5 |
| 30. | Mention the Alternate Sources that is used for the Biogas Production. | | CO4 | R | 5 |
| 31. | Write in detail about Geothermal Energy Source. | | CO5 | U | 5 |
| 32. | Explain about Solar Distillation. | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Give a sketch of Updraft Gasifier and explain it. | CO5 | U | 7 |
|  | b. | Write in detail about KVIC Biogas Plant with its sketch. | CO4 | U | 8 |
|  |  |  |  |  |  |
| 34. | a. | Explain Solar Dryer and Solar Cooker with sketches. | CO2 | U | 8 |
|  | b. | Describe the main components of windmill and explain its working principle. | CO6 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain Bio-diesel Production in Laboratory method. | CO5 | U | 7 |
|  | b. | Explain in brief about Solar water Heater and Solar Pumping unit with its neat Sketch. | CO2 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Gain basic knowledge of Solar energy harvesting |
| **CO2** | Familiarize with different types of Solar energy gadgets |
| **CO3** | Understand the contributions of energy sources to agriculture |
| **CO4** | Remember different types of biogas production structures |
| **CO5** | Design renewable energy structures |
| **CO6** | Analyze the green energy techniques |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 1 | 12 |  |  |  |  | 13 |
| **CO2** | 1 | 26 | 1 |  |  |  | 28 |
| **CO3** | 2 | 6 |  |  |  |  | 08 |
| **CO4** | 9 | 20 | 5 | 1 |  |  | 35 |
| **CO5** | 3 | 24 |  |  |  |  | 27 |
| **CO6** | 2 | 12 |  |  |  |  | 14 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2307** | **Duration** | **3hrs** |
| **Course Title** | **PROBLEMATIC SOILS AND THEIR MANAGEMENT** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Differentiate soil health and soil quality. | | CO1 | R | 1 |
| 2. | List uncultivable waste lands. | | CO1 | U | 1 |
| 3. | Write the Characteristics and Management of shallow soil. | | CO1 | A | 1 |
| 4. | What is the permissible limit of soluble sodium percentage in irrigation water? | | CO2 | An | 1 |
| 5. | If the Irrigation water contains 1664 mg/l of soluble salts, express its salinity in terms of EC. | | CO2 | An | 1 |
| 6. | Write the formula to calculate RSC in irrigation water. | | CO2 | R | 1 |
| 7. | List 4 sensors for characterization of salt affected soil. | | CO3 | R | 1 |
| 8. | Expand NDVI. | | CO3 | U | 1 |
| 9. | Application of GIS in Management of problem soil. | | CO3 | U | 1 |
| 10. | List promising woody species for saline soil. | | CO4 | A | 1 |
| 11. | Define agro forestry. | | CO4 | R | 1 |
| 12. | State the role of MPT in land use system. | | CO4 | E | 1 |
| 13. | What are the kinds of pollution in soil? | | CO5 | U | 1 |
| 14. | Mention the LCC color on standard maps. | | CO5 | U | 1 |
| 15. | How many agro ecology regions (AER) and agro ecology sub regions (AESR) in India? | | CO6 | R | 1 |
| 16. | What is agro ecology? | | CO6 | U | 1 |
| 17. | Write the Leaching requirement formula. | | CO1 | An | 1 |
| 18. | List out the amendments used to manage acid soil. | | CO1 | A | 1 |
| 19. | Describe the role of Mangroves in waste land management. | | CO1 | A | 1 |
| 20. | Define Pytoremediation. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the characteristics, source and management of Acid Sulphate soil. | | CO1 | A | 5 |
| 22. | Discuss in brief about the characteristics and management of excessively and slow permeable soil. | | CO1 | U | 5 |
| 23. | Summarize the effects of salts on plant growth and development. | | CO1 | An | 5 |
| 24. | Explain Bioremediation of problematic soil through Multipurpose tree species. | | CO4 | A | 5 |
| 25. | What is the basis for interpretative grouping of soils in the Land capability classification? | | CO5 | An | 5 |
| 26. | Explain the components and functions of GIS. | | CO3 | E | 5 |
| 27. | Classify the types of Water erosion and write about universal soil loss equation. | | CO1 | A | 5 |
| 28. | Cation exchange capacity and the ionic concentrations of 100 g of a soil are given below. Calculate Exchangeable Sodium Percentage. CEC= 15 meq,Ca= 5 meq, Mg= 2.0 meq, Na= 2.5 meq, K= 1.5 meq. | | CO2 | E | 5 |
| 29. | Write the Steps involved in Mapping of waterlogged area trough remote sensing. | | CO3 | A | 5 |
| 30. | Explain the characteristics of brackish water. | | CO4 | A | 5 |
| 31. | Write about the structure of the land suitability classification. | | CO5 | E | 5 |
| 32. | Discuss in detail about the potential of agro forestry systems in management of problem soils. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain in detail about soil health indicators. | CO1 | U | 7.5 |
|  | b. | Brief the characteristics and management of Sodic soil. | CO1 | E | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Write a note on criteria of evaluating irrigation water. | CO2 | An | 7.5 |
|  | b. | Outline the management practices to be followed while using poor quality irrigation water. | CO2 | E | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Classify sensors in remote sensing and explain. | CO3 | A | 7.5 |
|  | b. | Explain RS & GIS in diagnosis and management of salt affected soil. | CO3 | An | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Identify the waste lands and problematic soils and recommend appropriate management practices. |
| **CO2** | Analyze the suitability of water for irrigation based on quality standards |
| **CO3** | Apply remote sensing and GIS techniques in the management of problematic soils |
| **CO4** | Suggest suitable bioremediation measures for the problematic soils. |
| **CO5** | Evaluate the land based on Land Capability and Suitability Classes. |
| **CO6** | Assess the suitability of problematic soils in various agro-ecosystems. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG2353** | **Duration** | **3hrs** |
| **Course Title** | **DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT-II** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write the causal organism of wheat stem rust disease. | | CO1 | R | 1 |
| 2. | Give an example for internally seed born fungal disease in wheat. | | CO1 | R | 1 |
| 3. | The affected plants are stunted and the central shoot is converted into a long curved whip like sorus is the symptoms of ----------- disease in sugarcane. | | CO2 | R | 1 |
| 4. | Capitulum rot of sunflower disease is caused by ----------- | | CO2 | U | 1 |
| 5. | Write the causal organism of Alternaria **Blight disease of sunflower.** | | CO1 | A | 1 |
| 6. | The White to creamy yellow pustules develop on the lower leaf surface is the characteristics symptoms of -------- disease in mustard. | | CO2 | U | 1 |
| 7. | List any two important diseases in cotton. | | CO2 | R | 1 |
| 8. | Write the causal organism of **Powdery mildew diseases of peas.** | | CO3 | A | 1 |
| 9. | The whistish powdery growth is seen on the inflorescence, leaves, stalk of inflorescnce and young fruits is the characteristics symptoms of----- in mango. | | CO2 | R | 1 |
| 10. | Write the causal organism of citrus canker. | | CO3 | An | 1 |
| 11. | List any two important disease in grapes. | | CO3 | A | 1 |
| 12. | Infected shoots turn black and curl giving a 'Shepherd's Crook' appearance is symptoms of ------------ disease in apple. | | CO2 | A | 1 |
| 13. | Peach leaf curl is a---------disease. | | CO4 | U | 1 |
| 14. | Tomato spotted wilt virus is transmitted by-------- | | CO5 | An | 1 |
| 15. | List out any two fungal disease in cucurbits? | | CO5 | R | 1 |
| 16. | Black smut sori are seen at the base of the leaf surface is the symptoms---- disease in onion | | CO6 | U | 1 |
| 17. | Chilli leaf curl diseases is transmitted by-------? | | CO6 | A | 1 |
| 18. | List any two important disease in coriander. | | CO1 | A | 1 |
| 19. | Write the causal organism of Stem gall disease of coriander. | | CO2 | U | 1 |
| 20. | Lemon yellow pustules appear on lower surface of the leaves and stems is the symptoms of ------- disease in rose | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain about three important diseases in sunflower. | | CO1 | R | 5 |
| 22. | List the fungal diseases if mango & explain it. | | CO2 | U | 5 |
| 23. | List the bacterial, viral disease of citrus and explain Huanglongbingdisease. | | CO3 | U | 5 |
| 24. | Differentiate fusarium wilt Vs. Verticillium wilt | | CO4 | An | 5 |
| 25. | Write the symptoms & management of **Ascochyta blight in grams**. | | CO5 | C | 5 |
| 26. | Illustrate difference between grapes downy mildew Vs. powdery mildew disease. | | CO6 | R | 5 |
| 27. | Explain the symptoms, pathogen character and management of scab disease of apple. | | CO1 | A | 5 |
| 28. | Write the difference between early blight and late blight disease of potato. | | CO2 | C | 5 |
| 29. | Illustrate basal rot disease of onion. | | CO3 | A | 5 |
| 30. | Explain the symptoms, pathogen character of **Rhizome rot** disease in turmeric. | | CO4 | An | 5 |
| 31. | List the diseases of coriander and explain it. | | CO5 | R | 5 |
| 32. | List the diseases of rose and explain rust disease. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Summarize the diseases of wheat. | CO1 | R | 8 |
|  | b. | Elaborate the fungal diseases of citrus. | CO4 | A | 7 |
|  |  |  |  |  |  |
| 34. | a. | Examine the important diseases of sugarcane. | CO2 | R | 8 |
|  | b. | Describe the diseases of chilli. | CO5 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Elaborate the bacterial and viral diseases of potato. | CO3 | A | 8 |
|  | b. | Describe the diseases of Rose. | CO6 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| **CO1** | Correlate the various plant pathological terms with basic concepts of important plant diseases |
| **CO2** | Identify the disease symptoms of various plant diseases of field and horticultural crops |
| **CO3** | Review the impact of host pathogen interaction on disease development in field and horticultural crops |
| **CO4** | Evaluate the prevalence, epidemiology and factors affecting disease development |
| **CO5** | Comprehend disease cycle of plant pathogens. |
| **CO6** | Acquire skills on management practices for diseases of field and horticultural crops. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 15 | - | 7 | - | - | - | 22 |
| **CO2** | 11 | 8 | 1 | - | - | 5 | 25 |
| **CO3** | - | 5 | 15 | 1 | - | - | 21 |
| **CO4** | 1 | 1 | 7 | 10 | - | - | 19 |
| **CO5** | 6 | 7 | - | 1 | - | 5 | 19 |
| **CO6** | 12 | 6 | 1 | - | - | - | 19 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **21AG2453** | **Duration** | **3hrs** |
| **Course Title** | **PROTECTED CULTIVATION AND SECONDARY AGRICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define the term Greenhouse Technology. | | CO2 | U | 1 |
| 2. | What is the wavelength range of Ultraviolet Radiation? | | CO2 | U | 1 |
| 3. | Piezometer is an instrument used for measurement of \_\_\_\_\_\_\_\_\_\_. | | CO1 | A | 1 |
| 4. | What is meant by Greenhouse effect? | | CO2 | U | 1 |
| 5. | What is a Shade net house? | | CO2 | U | 1 |
| 6. | What is the acceptable range of relative humidity for plants to grow under greenhouse condition? | | CO1 | R | 1 |
| 7. | Name the type of wood used for construction of low cost Greenhouse. | | CO1 | R | 1 |
| 8. | In which year the National Committee on Plasticulture Applications in Horticulture is established? | | CO6 | An | 1 |
| 9. | List the different types of troughs used in screw conveyor. | | CO6 | U | 1 |
| 10. | Desired moisture content of agriculture produce (cereals, pulses and millets) at the time of storing is\_\_\_\_\_\_. | | CO4 | U | 1 |
| 11. | Write the formula to find Coefficient of Friction. | | CO4 | R | 1 |
| 12. | Expand: CFC. | | CO2 | R | 1 |
| 13. | Define bulk density. | | CO4 | U | 1 |
| 14. | Give an example of Continuous flow mixing type dryer. | | CO5 | R | 1 |
| 15. | \_\_\_\_\_\_is a measure of the sharpness of the solid material. | | CO6 | C | 1 |
| 16. | What is Thermal Velocity? | | CO3 | U | 1 |
| 17. | Name the different types of belt conveyor idlers. | | CO6 | U | 1 |
| 18. | What is meant by passive ventialation in Greenhouse? | | CO1 | U | 1 |
| 19. | Give an example of short day plant. | | CO2 | U | 1 |
| 20. | Expand: EMC. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Elaborate the working principle of bucket elevator. | | CO6 | U | 5 |
| 22. | Differentiate Shade net vs Greenhouse. | | CO3 | U | 5 |
| 23. | Elaborate the types of green house in context with utility and shape. | | CO3 | C | 5 |
| 24. | Differentiate Direct and Indirect Methods of Moisture Measurements. | | CO4 | U | 5 |
| 25. | Explain the working of fluidized bed dryer. | | CO5 | E | 5 |
| 26. | Elaborate the working principle of bucket elevator. | | CO6 | U | 5 |
| 27. | What is meant by low cost greenhouse? How it benefits the farmer? | | CO1 | A | 5 |
| 28. | Write a note on “Forced ventilated greenhouse”. | | CO2 | R | 5 |
| 29. | Elaborate the different types of irrigation system. | | CO3 | C | 5 |
| 30. | Write a short note on thermal properties for handling biological materials. | | CO4 | R | 5 |
| 31. | What do you mean by Mechanical drying of grains? Discuss the strength and weakness of these dryers. | | CO5 | A | 5 |
| 32. | Elaborate the working principle of screw conveyor. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What are the physical properties that are considered for handling biological materials? Explain briefly. | CO4 | U | 10 |
|  | b. | Compare short day plants Vs. Long day plants and give examples. | CO1 | U | 5 |
|  |  |  |  |  |  |
| 34. | a. | List out the Material handling Equipment’s with diagrams. | CO6 | A | 10 |
|  | b. | How fog and mist work for propagation under protected cultivation? | CO3 | An | 5 |
|  |  |  |  |  |  |
| 35. | a. | Define Drying. Elaborate about natural drying and artificial drying process followed for agriculture produces like grains. | CO5 | U | 10 |
|  | b. | Classify the greenhouse types based on shape with a neat diagram. | CO1 | R | 5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Plan and design low cost green houses |
| **CO2** | Predict the plant responses to greenhouse environment |
| **CO3** | Understand the production and the economics of protected cultivation |
| **CO4** | Understand engineering properties of food materials |
| **CO5** | Explain the working of commercial grain dryers |
| **CO6** | Illustrate the material handling equipment |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 7 | 6 | 6 | - | - | - | 19 |
| **CO2** | 6 | 5 | - | - | - | - | 11 |
| **CO3** | 1 | 6 | - | 5 | - | 10 | 22 |
| **CO4** | 6 | 17 | - | - | - | - | 23 |
| **CO5** | 1 | 10 | 5 | - | 5 | - | 21 |
| **CO6** | - | 12 | 10 | 1 | 6 | - | 29 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21AG3226** | **Duration** | **3hrs** |
| **Course Title** | **AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write about Maurya empire? | | CO1 | R | 1 |
| 2. | Define "Law of the Minimum". | | CO2 | R | 1 |
| 3. | Define Research ethics. | | CO1 | U | 1 |
| 4. | Distinguish between NGOs and Voluntary Organizations. | | CO4 | R | 1 |
| 5. | Define Plagiarism. | | CO1 | U | 1 |
| 6. | Expand UNESCO. | | CO4 | R | 1 |
| 7. | Write a short note on Drought Prone Area Programme. | | CO1 | R | 1 |
| 8. | Name four current NAAS-rated journals. | | CO4 | U | 1 |
| 9. | Expand PAC. | | CO6 | U | 1 |
| 10. | Write about editorial review. | | CO3 | R | 1 |
| 11. | Review about Dimensions of livelihood security. | | CO3 | U | 1 |
| 12. | Describe Intensive Agricultural District Programme (IADP). | | CO3 | U | 1 |
| 13. | Define Panchayati Raj. | | CO4 | U | 1 |
| 14. | Write details about Gram Sabha meeting. | | CO1 | U | 1 |
| 15. | Define Community development. | | CO3 | U | 1 |
| 16. | Define Computer Ethics. | | CO2 | R | 1 |
| 17. | Write about the Green Revolution. | | CO2 | U | 1 |
| 18. | Name five agricultural research institute of ICAR along with their locations. | | CO3 | R | 1 |
| 19. | Define International fellowships for scientific mobility. | | CO5 | R | 1 |
| 20. | Expand SGSY. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss about the ethics in environment issues. | | CO2 | A | 5 |
| 22. | Describe why ethical approval is required for human subject’s research. | | CO1 | A | 5 |
| 23. | List some of the ancient literature that explains about the ancient agriculture. | | CO1 | U | 5 |
| 24. | Classify the steps in publication process. | | CO1 | U | 5 |
| 25. | Draw the various mandatory activities of ICAR. | | CO2 | R | 5 |
| 26. | Enumerate the details of three tier of Panchayat Raj System. | | CO3 | U | 5 |
| 27. | Interpret the various Community Development Programmes. | | CO2 | A | 5 |
| 28. | Describe the different types of publications. | | CO3 | R | 5 |
| 29. | Identify the key components of HYVP? | | CO2 | U | 5 |
| 30. | Summarize all issues related to Ethical concern in Research. | | CO2 | A | 5 |
| 31. | Narrate the various functions of National Agricultural Research Systems (NARS). | | CO3 | A | 5 |
| 32. | Explain the primary causes and various forms of plagiarism. | | CO1 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe in detail about historical stages of agricultural development. | CO1 | U | 7.5 |
|  | b. | Classify the various revolutions related to agriculture and allied activities. | CO2 | R | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Interpret the Consultative Group on international Agricultural Research (CGIAR). | CO1 | R | 7.5 |
|  | b. | Enumerate the various policies and strategies of India's rural development programmes. | CO3 | R | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Elaborate the research misconduct and how journal authorities detect and manage research paper misconduct? | CO4 | R | 7.5 |
|  | b. | Identify the different constraints in implementation of rural development programmes. | CO3 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the research ethics. |
| **CO2** | Remember the National and International agencies involved in Agricultural Research. |
| **CO3** | Analyse the various Rural Development Programs. |
| **CO4** | Apply their knowledge on understanding the policies of Government. |
| **CO5** | Transfer their knowledge at international level. |
| **CO6** | Attract International collaborations for doing Research. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 14.5 | 20.5 | 5.0 | - | - | - | 40.0 |
| **CO2** | 14.5 | 6.0 | 15.0 | - | - | - | 35.5 |
| **CO3** | 15.5 | 15.5 | 5.0 | - | - | - | 36.0 |
| **CO4** | 9.5 | 2.0 | - | - | - | - | 11.5 |
| **CO5** | 1.0 | - | - | - | - | - | 1.0 |
| **CO6** | - | 1.0 | - | - | - | - | 1.0 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21HO1270** | **Duration** | **3hrs** |
| **Course Title** | **PRODUCTION TECHNOLOGY FOR FRUIT AND PLANTATION CROPS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Expand APEDA. | | CO1 | R | 1 |
| 2. | List any two institutes working on fruit and plantation crops. | | CO1 | R | 1 |
| 3. | Write the important rootstocks of grapes and citrus. | | CO1 | R | 1 |
| 4. | Name the compound responsible for bitterness in citrus and colour in papaya. | | CO2 | R | 1 |
| 5. | Define mango malformation. | | CO2 | R | 1 |
| 6. | Write the commercial propagation method in banana and mango. | | CO2 | C | 1 |
| 7. | Define dehorning. | | CO3 | R | 1 |
| 8. | Write any two fruits rich in vitamin A. | | CO3 | C | 1 |
| 9. | List the polyembryonic rootstocks of mango. | | CO3 | R | 1 |
| 10. | Differentiate training and pruning. | | CO4 | U | 1 |
| 11. | Explain thinning in papaya. | | CO4 | U | 1 |
| 12. | Name the commercial varieties of banana and pomegranate. | | CO4 | R | 1 |
| 13. | Select the crop associated with the term albinism  Mango, litchi, strawberry, guava | | CO5 | R | 1 |
| 14. | List the pollinizers in apple. | | CO5 | R | 1 |
| 15. | Differentiate climacteric and non-climacteric fruits. | | CO6 | U | 1 |
| 16. | Explain recalcitrant seeds. | | CO6 | R | 1 |
| 17. | Define plantation crops. | | CO6 | R | 1 |
| 18. | Write the commercial propagation method in apple and peach. | | CO2 | C | 1 |
| 19. | The term denavelling is related to Mango, guava, banana, citrus. | | CO2 | R | 1 |
| 20. | List the commercial fruits of Tamil Nadu. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Enumerate the commercial propagation method in mango, banana, citrus, papaya, apple. | | CO2 | R | 5 |
| 22. | Explain planting methods in strawberry. | | CO2 | U | 5 |
| 23. | Discuss papain extraction in papaya. | | CO4 | U | 5 |
| 24. | Describe pruning methods in grapes. | | CO4 | U | 5 |
| 25. | List any two commercial varieties with key features in mango, papaya and banana. | | CO4 | R | 5 |
| 26. | Differentiate between tall and dwarf coconuts. | | CO4 | U | 5 |
| 27. | Explain the different types of cocoa. | | CO4 | U | 5 |
| 28. | Discuss the mother palm selection in coconut and areca nut. | | CO2 | U | 5 |
| 29. | Write a short note on propagation in jackfruit and papaya. | | CO2 | C | 5 |
| 30. | Explain the bahar treatment in guava. | | CO4 | U | 5 |
| 31. | Illustrate paring and pralinage in banana. | | CO2 | U | 5 |
| 32. | Discuss the physiological disorders with management practices in citrus. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the scope and importance of fruit and plantation crops in India. | CO4 | U | 7.5 |
|  | b. | Enumerate the processing in tea. | CO5 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Describe the physiological disorders in mango. | CO4 | U | 7.5 |
|  | b. | Write in detail about the rubber tapping process. | CO5 | C | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain physiological disorders in grapes with management practices. | CO4 | U | 7.5 |
|  | b. | Write the importance of growth regulators in fruit crops. | CO3 | C | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Analyze the industrial potential of fruit and plantation crops |
| **CO2** | Develop skills on propagation methods of fruit and plantation crops |
| **CO3** | Demonstrate knowledge gained on use of growth regulators in fruit crops |
| **CO4** | Apply the knowledge gained in production technologies of fruit and plantation crops |
| **CO5** | Develop entrepreneurial skills in processing of fruit and plantation crops |
| **CO6** | Get equipped in plantation and orchard management |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 3 | -- | -- | -- | -- | -- | 3 |
| **CO2** | 8 | 15 | -- | -- | -- | 7 | 30 |
| **CO3** | 2 | -- | -- | -- | -- | 8.5 | 10.5 |
| **CO4** | 7 | 54.5 | -- | -- | -- | -- | 61.5 |
| **CO5** | 2 | 7.5 | -- | -- | -- | 7.5 | 17 |
| **CO6** | 2 | 1 | -- | -- | -- | -- | 3 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **21HO2272** | **Duration** | **3hrs** |
| **Course Title** | **PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS, MAP AND LANDSCAPING** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name the propagation methods followed in rose and carnation. | | CO1 | U | 1 |
| 2. | List the types of protected structures. | | CO1 | A | 1 |
| 3. | List the advantages of protected cultivation. | | CO1 | R | 1 |
| 4. | What is pinching? | | CO2 | U | 1 |
| 5. | How to break dormancy in gladiolus? | | CO2 | A | 1 |
| 6. | Write the importance and uses of tuberose. | | CO2 | U | 1 |
| 7. | List the uses of periwinkle. | | CO3 | R | 1 |
| 8. | Describe the economic part of isabgol and asparagus. | | CO3 | R | 1 |
| 9. | Name the Propagation methods followed in lemon grass, rose, geranium and aloe. | | CO3 | U | 1 |
| 10. | How to extract the alkaloids from aloe, ashwagandha, costus? | | CO4 | A | 1 |
| 11. | Describe Post harvest handling of geranium and vetiver. | | CO4 | A | 1 |
| 12. | What is concrete and absolute | | CO4 | U | 1 |
| 13. | Write two red colour flowering tree name. | | CO5 | R | 1 |
| 14. | Mention two uses of climbers and annuals in landscaping. | | CO5 | R | 1 |
| 15. | Mention the main features of formal style of garden. | | CO6 | U | 1 |
| 16. | Give an example for informal style garden. | | CO6 | R | 1 |
| 17. | What is balance, rhythm and topiary? | | CO6 | U | 1 |
| 18. | What is bending? | | CO1 | U | 1 |
| 19. | Describe the propagation of jasmine. | | CO2 | A | 1 |
| 20. | Describe Post harvest handling of rose and marigold. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write short notes on Production technology of carnation under protected condition. | | CO1 | A | 5 |
| 22. | Write short notes on lifting, Curing and storage of tuberose bulb. | | CO2 | U | 5 |
| 23. | List the methods of conservation of medicinal plants. | | CO3 | R | 5 |
| 24. | Write about the processing involved in lemon grass and geranium. | | CO4 | A | 5 |
| 25. | List the uses of trees in institutional garden. | | CO5 | R | 5 |
| 26. | Draw a Mughal garden layout with their features. | | CO6 | A | 5 |
| 27. | Describe the special practices followed in cut flowers. | | CO1 | U | 5 |
| 28. | Write about the Physiological disorders in flower crops. | | CO2 | R | 5 |
| 29. | List out the aromatic plants and their uses. | | CO3 | R | 5 |
| 30. | Describe Value addition of flower crops. | | CO4 | R | 5 |
| 31. | Describe the role of shrubs in landscaping. | | CO5 | U | 5 |
| 32. | What is free style garden? | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write elaborately about care and maintenance of protected structure. | CO1 | R | 7.5 |
|  | b. | Explain the processing techniques followed in medicinal plants. | CO4 | A | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Explain the Production technology of loose flowers. | CO2 | A | 7.5 |
|  | b. | Describe the role of trees in landscaping under different conditions. | CO5 | R | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Describe the role of aromatic plants in human health. | CO3 | R | 7.5 |
|  | b. | Explain the Principles of landscaping. | CO6 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Apply knowledge in cut flower production under protected cultivation for gainful employment or entrepreneurship |
| **CO2** | Demonstrate skills for cut and loose flower production under open condition |
| **CO3** | Apply skills in identification and conservation of medicinal and aromatic plants and analyze their application |
| **CO4** | Acquire skills in processing of medicinal and aromatic plants and post harvest handling of cut and loose flowers |
| **CO5** | Exploit knowledge on use of plants and trees for landscaping under different conditions |
| **CO6** | Design and layout different styles of gardens |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 8.5 | 7 | 6 | - | - | - | 21.5 |
| **CO2** | 5 | 7 | 9.5 | - | - | - | 21.5 |
| **CO3** | 19.5 | 1 | - | - | - | - | 20.5 |
| **CO4** | 6 | 1 | 14.5 | - | - | - | 21.5 |
| **CO5** | 14.5 | 5 | - | - | - | - | 19.5 |
| **CO6** | 6 | 2 | 12.5 | - | - | - | 20.5 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **21HO2273** | **Duration** | **3hrs** |
| **Course Title** | **POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What do you mean by postharvest technology? | | CO1 | U | 1 |
| 2. | Define processing. | | CO1 | R | 1 |
| 3. | What is harvest index? | | CO1 | U | 1 |
| 4. | Define shelf life. | | CO2 | R | 1 |
| 5. | What is commercial maturity? | | CO2 | U | 1 |
| 6. | Define curing. | | CO2 | U | 1 |
| 7. | Expand and define TSS. | | CO3 | A | 1 |
| 8. | What do you mean by climacteric fruits? | | CO3 | A | 1 |
| 9. | What is value addition? | | CO3 | U | 1 |
| 10. | Define packaging. | | CO4 | R | 1 |
| 11. | Define pre-cooling. | | CO4 | R | 1 |
| 12. | What do you mean by grading of fruits? | | CO4 | A | 1 |
| 13. | Define vapour heat treatment of fruits. | | CO5 | U | 1 |
| 14. | What is pulsing? | | CO5 | U | 1 |
| 15. | Define zero energy cool chamber | | CO6 | U | 1 |
| 16. | Define evaporative cooling technology. | | CO6 | A | 1 |
| 17. | What do you mean by hypobaric storage? | | CO6 | U | 1 |
| 18. | What is vacuum cooling? | | CO1 | R | 1 |
| 19. | Define waxing. | | CO2 | R | 1 |
| 20. | Write the principle of modified atmospheric packaging. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Summarize the different methods used for analyzing the maturity indices of horticultural crops. | | CO1 | An | 5 |
| 22. | Compare manual harvesting and mechanical harvesting. | | CO1 | E | 5 |
| 23. | Illustrate the physiological and biochemical changes that occur during the ripening of fruits. | | CO4 | U | 5 |
| 24. | Illustrate the role of ethylene in post-harvest technology. | | CO1 | A | 5 |
| 25. | Compare CAS and MAS. List out the merits and demerits. | | CO5 | E | 5 |
| 26. | Illustrate the different packaging materials used for prepackaging of horticultural commodities. | | CO5 | A | 5 |
| 27. | Explain the principles of preservation of fruits and vegetables. | | CO4 | U | 5 |
| 28. | Compare the natural and artificial preservatives. | | CO4 | A | 5 |
| 29. | Describe the procedure for the preparation of wine. | | CO4 | R | 5 |
| 30. | Illustrate the different types of driers used for dehydration of fruits and vegetables. | | CO3 | A | 5 |
| 31. | Summarize the different types of waxes used for coating the fruits and vegetables. | | CO3 | A | 5 |
| 32. | Illustrate the methods of preservation using salt. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe the scope and importance of post-harvest technology. | CO2 | U | 7.5 |
|  | b. | Enumerate the reasons for post-harvest losses of horticultural crops. | CO2 | A | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Compare and contrast the natural and artificial packaging materials. | CO1 | E | 7.5 |
|  | b. | Appraise the present packaging system of fruits and vegetables in India. | CO3 | An | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write about the canning technology along with its merits and demerits. | CO5 | A | 7.5 |
|  | b. | Describe the causes of spoilage of canned foods. | CO5 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | |  | | --- | | Remember the different post-harvest management of important fruits and vegetables | |
| **CO2** | |  | | --- | | Understand the factors causing postharvest losses in fruits and Vegetables | |
| **CO3** | Understand principles and methods of preserving fruits and vegetables |
| **CO4** | Explain about the different value addition process of important fruits and vegetables |
| **CO5** | Examine the process of food spoilage and quality control of processed food |
| **CO6** | Demonstrate knowledge about the different government schemes and laws in import and export |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 2 | 2 | 5 | 5 | 12.5 | - | 26.5 |
| **CO2** | 2 | 9.5 | 7.5 | - | - | - | 19 |
| **CO3** | - | 1 | 12 | 7.5 | - | - | 20.5 |
| **CO4** | 7 | 16 | 6 | - | - | - | 29 |
| **CO5** | 7.5 | 2 | 12.5 | - | 5 | - | 27 |
| **CO6** | - | 2 | 1 | - | - | - | 3 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **21HO2274** | **Duration** | **3hrs** |
| **Course Title** | **PRINCIPLES OF FOOD SCIENCE NUTRITION** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Food Rheology. | | CO1 | U | 1 |
| 2. | What is boiling point? | | CO1 | R | 1 |
| 3. | List water soluble vitamins. | | CO1 | R | 1 |
| 4. | Define Enzymatic browning. | | CO2 | U | 1 |
| 5. | Define Essential Fatty acids. | | CO2 | R | 1 |
| 6. | Define Maillard reaction. | | CO2 | U | 1 |
| 7. | What are the signs of Food Spoilage? | | CO3 | U | 1 |
| 8. | Define Fermentation. | | CO3 | U | 1 |
| 9. | Define Pasteurization. | | CO3 | U | 1 |
| 10. | Mention any four types of foods that can be preserved by chemical preservatives. | | CO4 | R | 1 |
| 11. | Mention any two common causes of food spoilage. | | CO4 | R | 1 |
| 12. | Name any four Chemical preservatives that are used for Food Preservation. | | CO4 | R | 1 |
| 13. | Write two symptoms of iron-deficiency anaemia. | | CO5 | R | 1 |
| 14. | List any two deficiency diseases of Vitamin A. | | CO5 | U | 1 |
| 15. | What are the four attributes of a therapeutic diet? | | CO6 | U | 1 |
| 16. | Define standard diet. | | CO6 | U | 1 |
| 17. | Define Modified Diet. | | CO6 | U | 1 |
| 18. | Define Food. | | CO1 | U | 1 |
| 19. | List the Fat-Soluble Vitamins. | | CO2 | U | 1 |
| 20. | Define Canning. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | How fats can be classified on the basis of chemical composition? | | CO1 | A | 5 |
| 22. | Explain Carbohydrate Metabolism and how excess and insufficient intake leads to health problem. | | CO2 | U | 5 |
| 23. | Food Irradiation – Describe the principle, types and advantages in food preservation. | | CO3 | U | 5 |
| 24. | Explain the chemical changes that occur in a food due to spoilage. | | CO4 | A | 5 |
| 25. | Name minerals important for our body and what are the rich sources of iron? | | CO5 | A | 5 |
| 26. | Summarize the physiological functions of food. | | CO6 | U | 5 |
| 27. | What is rancidity and explain types of rancidity? | | CO1 | A | 5 |
| 28. | How proteins can be classified based on functions and composition? | | CO2 | U | 5 |
| 29. | Explain different methods of freezing. | | CO3 | U | 5 |
| 30. | Write Physical Method of Food Preservation. | | CO4 | U | 5 |
| 31. | What are the three forms of protein energy malnutrition and list their symptoms? | | CO5 | A | 5 |
| 32. | What are the factors that will affect meal planning? | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain different food groups in planning balanced diets. | CO1 | U | 7.5 |
|  | b. | Describe the functions of different nutrients in our body. | CO1 | A | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Classify vitamins and describe their functions. | CO2 | A | 7.5 |
|  | b. | Describe the dietary sources of Fat-Soluble Vitamins. | CO2 | U | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Define Food Preservation. Describe its methods. List the advantages and disadvantages of each of them. | CO3 | U | 7.5 |
|  | b. | Explain any two chemical preservatives that are used for food Preservation. | CO3 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Explain the concept of food Science |
| **CO2** | Enumerate and describe food composition and food chemistry |
| **CO3** | Demonstrate the principles and methods of food processing |
| **CO4** | Analyze the methods to control microbes and preserve food |
| **CO5** | Identify the nutritional disorders |
| **CO6** | Design balanced/modified diet to meet consumer needs |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 2 | 9.5 | 17.5 | -- | -- | -- | 29 |
| **CO2** | 1 | 20.5 | 7.5 | -- | -- | -- | 29 |
| **CO3** | - | 20.5 | 7.5 | -- | -- | -- | 28 |
| **CO4** | 3 | 6 | 5 | -- | -- | -- | 14 |
| **CO5** | 1 | 1 | 10 | -- | -- | -- | 12 |
| **CO6** | -- | 13 | -- | -- | -- | -- | 13 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **22AG2308** | **Duration** | **3hrs** |
| **Course Name** | **AGROCHEMICALS** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is Agrochemicals? | | CO1 | U | 1 |
| 2. | List out the commercially available insecticide formulations. | | CO4 | R | 1 |
| 3. | Ammonium Nitrate contains \_\_\_\_\_\_\_\_\_\_\_\_ % of nitrogen content. | | CO1 | U | 1 |
| 4. | Mention the use of endosulphan. | | CO1 | R | 1 |
| 5. | Write the function of systemic insecticide. | | CO2 | An | 1 |
| 6. | Explain the mode of action of carbamate group of insecticides. | | CO2 | A | 1 |
| 7. | When was Fertilizer Control Order enacted? | | CO3 | R | 1 |
| 8. | Define Pesticides. | | CO3 | R | 1 |
| 9. | Define Metaxyl. | | CO3 | A | 1 |
| 10. | Define LD50 value and state its significance. | | CO1 | A | 1 |
| 11. | Differentiate between Fertilizer grade and Fertilizer formula. | | CO4 | U | 1 |
| 12. | Define Molluscides. | | CO4 | R | 1 |
| 13. | List few agrochemicals banned in India. | | CO5 | R | 1 |
| 14. | What is called as Fillers? | | CO5 | An | 1 |
| 15. | Name two animal origin pesticides. | | CO6 | R | 1 |
| 16. | List few Insect Growth Regulators that can be used to control pests. | | CO6 | R | 1 |
| 17. | State the function of permethrin. | | CO6 | An | 1 |
| 18. | What is Granules? | | CO1 | An | 1 |
| 19. | List the uses of Lindane. | | CO2 | U | 1 |
| 20. | Define Rodenticide. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Classify Fungicides with examples. | | CO1 | A | 5 |
| 22. | Discuss on the fate of pesticides in soil and plant. | | CO2 | U | 5 |
| 23. | Interpret the use of rock phosphate as fertilizer and explain preparation of basic slag. | | CO3 | E | 5 |
| 24. | Write about slow release N- fertilizers. | | CO4 | R | 5 |
| 25. | Describe the importance of need based application of insecticides and the consequences of indiscriminate use. | | CO5 | An | 5 |
| 26. | Discuss in detail the role of various Insect Growth Regulators (IGR) in agriculture. | | CO6 | A | 5 |
| 27. | Give a short note on Systemic fungicides. | | CO1 | A | 5 |
| 28. | Describe the various copper fungicides, their mode of action and uses. | | CO2 | R | 5 |
| 29. | Write a detailed note on pesticide characteristics. | | CO3 | An | 5 |
| 30. | Explain the preparation of primary and secondary fertilizer combinations, their compatibility and precautions to be followed. | | CO4 | C | 5 |
| 31. | Describe Phosphorus fertilizers. | | CO5 | An | 5 |
| 32. | Explain Bio fertilizer and its importance. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Appraise on the use of agrochemicals in sustainable agriculture and criticize its effect on the environment. | CO1 | E | 7.5 |
|  | b. | Discuss on plant based bio pesticides and their uses in agriculture. | CO6 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Discuss on various carbamate formulations available in market and their uses. | CO4 | An | 7.5 |
|  | b. | What are systemic fungicides? Discuss on the superiority of these over other group of fungicides. | CO2 | An | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain in detail about organic fungicides and its characteristics. | CO3 | A | 7.5 |
|  | b. | Summarize the importance and advantages of Bio-pesticides. | CO5 | An | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the role of agrochemicals for sustainable agriculture |
| **CO2** | Remember the classification and mode of action |
| **CO3** | Familiarize with manufacturing, marketing and logistics |
| **CO4** | Develop skills in calculation, formulations of insecticides |
| **CO5** | Evaluate need based recommendation for various crops |
| **CO6** | Disseminate the plant based bio pesticides for sustainable agriculture |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 1 | 2 | 11 | 1 | 7.5 | - | 22.5 |
| **CO2** | 5 | 6 | 1 | 8.5 | - | - | 20.5 |
| **CO3** | 2 | - | 8.5 | 5 | 5 | - | 20.5 |
| **CO4** | 8 | 1 | - | 7.5 | - | 5 | 21.5 |
| **CO5** | 1 | - | - | 18.5 |  |  | 19.5 |
| **CO6** | 2 | 7.5 | 10 | 1 | - | - | 20.5 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **22HO2275** | **Duration** | **3hrs** |
| **Course Title** | **LANDSCAPING** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Differentiate between rhythm and balance. | | CO1 | U | 1 |
| 2. | Define topiary. | | CO1 | R | 1 |
| 3. | Mention the plant and non plant components in landscaping. | | CO1 | R | 1 |
| 4. | List the uses of shrubs in landscaping. | | CO2 | A | 1 |
| 5. | What is specimen plant in landscaping? | | CO2 | R | 1 |
| 6. | Mention the trees used in screening purpose. | | CO2 | R | 1 |
| 7. | Differentiate between French garden and Japanese garden. | | CO3 | U | 1 |
| 8. | List the main features in Brindavan garden. | | CO3 | R | 1 |
| 9. | Mention the famous gardens in India. | | CO3 | R | 1 |
| 10. | What is terrarium? | | CO4 | U | 1 |
| 11. | Define xeriscaping. | | CO4 | U | 1 |
| 12. | What is turf and turf plastering? | | CO4 | R | 1 |
| 13. | What is AutoCAD? | | CO5 | A | 1 |
| 14. | List the advantages of CAD system. | | CO5 | A | 1 |
| 15. | How to plan for formal style garden? | | CO6 | A | 1 |
| 16. | Mention the factors affecting the landscape design. | | CO6 | R | 1 |
| 17. | Identify the trees suited for coastal area. | | CO6 | R | 1 |
| 18. | List out the garden adornments. | | CO1 | R | 1 |
| 19. | List the types of palms used in landscape. | | CO2 | R | 1 |
| 20. | What is bonsai? | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write the principles followed in landscape design. | | CO1 | A | 5 |
| 22. | What is institutional garden and write the suitable ornamental plants? | | CO2 | U | 5 |
| 23. | Summarize the famous gardens in the world. | | CO3 | R | 5 |
| 24. | Explain the styles of floral arrangements. | | CO4 | R | 5 |
| 25. | Describe the application of AutoCAD in Formal design. | | CO5 | A | 5 |
| 26. | Describe Planning and design layout for informal style. | | CO6 | A | 5 |
| 27. | Explain the styles of landscape garden. | | CO1 | A | 5 |
| 28. | How to establish a garden with ornamental plants in industrial area? | | CO2 | A | 5 |
| 29. | Differentiate between national park and botanical garden. | | CO3 | U | 5 |
| 30. | Write short notes on Bonsai with their styles. | | CO4 | R | 5 |
| 31. | Write about the ArchCAD application in landscaping. | | CO5 | A | 5 |
| 32. | Explain the planning and layout of landscape design. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Elaborate the landscape principles with garden design. | CO1 | A | 7.5 |
|  | b. | Summarize the historical importance of landscape in India. | CO1 | R | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Summarize the uses of ornamental crops in different styles of garden. | CO2 | R | 7.5 |
|  | b. | Elaborate the different type of flower arrangement. | CO4 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Draw a layout with plant and non-plant component for formal and informal design garden. | CO3 | A | 7.5 |
|  | b. | Describe Lawn and their establishment method with different types of grass. | CO4 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the principles of ornamental horticulture and landscape design |
| **CO2** | Explain about the different ornamental cops and its suitability to different landscapes |
| **CO3** | Distinguish the different garden types of India and in abroad |
| **CO4** | Create unique lawn, floral arrangements, terrariums, xeriscaping and bonsai designs |
| **CO5** | Explore the different landscaping designs and architecture using AutoCAD and ArchCAD |
| **CO6** | Identify the factors the landscape design and planning |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 10.5 | 1 | 17.5 | - | - | - | 29 |
| **CO2** | 10.5 | 5 | 6 | - | - | - | 21.5 |
| **CO3** | 7 | 6 | 7.5 | - | - | - | 20.5 |
| **CO4** | 18.5 | 3 | 7.5 | - | - | - | 29 |
| **CO5** | - | - | 12 | - | - | - | 12 |
| **CO6** | 2 | - | 11 | - | - | - | 13 |
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**END SEMESTER EXAMINATION – APRIL / MAY 2025**

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| --- | --- | --- | --- |
| **Course Code** | **24AG3004** | **Duration** | **3hrs** |
| **Course Title** | **PRINCIPLES AND PRACTICES OF WATER MANAGEMENT** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define evapotranspiration. | | CO3 | R | 1 |
| 2. | What is effective root zone depth? | | CO4 | R | 1 |
| 3. | What is the irrigation requirement? | | CO2 | R | 1 |
| 4. | What is Percolation? | | CO3 | R | 1 |
| 5. | Define crop water use efficiency | | CO4 | R | 1 |
| 6. | Define Permanent wilting point | | CO3 | R | 1 |
| 7. | What is contingency irrigation? | | CO3 | R | 1 |
| 8. | Define Seepage. | | CO3 | R | 1 |
| 9. | What is available water? | | CO3 | R | 1 |
| 10. | Define fertigation. | | CO3 | R | 1 |
| 11. | Define effective rainfall. | | CO4 | R | 1 |
| 12. | List out the water soluble fertilizers. | | CO4 | R | 1 |
| 13. | What is surface drainage? | | CO5 | R | 1 |
| 14. | Define moisture extraction pattern. | | CO2 | R | 1 |
| 15. | What is surge irrigation? | | CO5 | R | 1 |
| 16. | \_\_\_\_\_\_\_\_\_\_\_\_soil has lowest water holding capacity. | | CO3 | R | 1 |
| 17. | Define Infiltration. | | CO3 | R | 1 |
| 18. | What is hydroponics? | | CO5 | R | 1 |
| 19. | Define rain water harvesting. | | CO5 | R | 1 |
| 20. | \_\_\_\_\_\_\_\_\_Israelian scientist invented drip irrigation. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the importance of water in crop production. | | CO1 | U | 5 |
| 22. | Explain classification of irrigation work or projects. Write important irrigation projects in India. | | CO1 | U | 5 |
| 23. | Write the water requirement for field crops and its irrigation schedule. | | CO2 | U | 5 |
| 24. | Write a short note on Soil - plant - atmosphere continuum. | | CO1 | U | 5 |
| 25. | Discuss about soil moisture constants. | | CO2 | U | 5 |
| 26. | Write a note on tensiometer and working principle. | | CO3 | U | 5 |
| 27. | Illustrate classification of irrigation water quality. | | CO4 | U | 5 |
| 28. | Explain Operation and Maintenance of sprinkler irrigation system. | | CO4 | U | 5 |
| 29. | Briefly discuss about factors affecting infiltration rate. | | CO3 | U | 5 |
| 30. | Explain water management in controlled environments and polyhouses. | | CO4 | U | 5 |
| 31. | Explain water use efficiency. Write any five indices of water use efficiency. | | CO4 | U | 5 |
| 32. | Explain plant response to moisture stress and plant adaptation to moisture stress. | | CO1 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Define irrigation scheduling. Write its practical approaches of irrigation scheduling. | CO6 | R | 8 |
|  | b. | Elaborate the components of drip irrigation system. Draw a neat sketch of drip irrigation system. Write merits and demerits of drip irrigation system. | CO3 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Explain factors affecting the suitability of waters for irrigation. Write the characteristics of good drainage system. | CO5 | U | 8 |
|  | b. | Explain the crop water requirement and factors affecting the crop water requirement along with critical stages for irrigation | CO1 | R | 7 |
|  |  |  |  |  |  |
| 35. | a. | Write a detailed note on methods of drainage system. Discuss the advantages and disadvantages of drainage system. | CO5 | U | 8 |
|  | b. | Discuss the main causes of the development of salty soils. Suggest the management practices of salty soils. | CO4 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the role of water in relation to metabolic and physiological functions of plants. |
| **CO2** | Optimize the water requirements for field crop cultivations. |
| **CO3** | Adopt different irrigation management strategies. |
| **CO4** | Apply the irrigation management principles for efficient water use. |
| **CO5** | Address different water management problems in irrigation. |
| **CO6** | Compute the layout of different irrigation systems |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | - | 20 | - | - | - | - | 20 |
| **CO2** | 2 | 10 | - | - | - | - | 12 |
| **CO3** | 9 | 10 | - | - | - | - | 19 |
| **CO4** | 4 | 20 | - | - | - | - | 24 |
| **CO5** | 4 | 30 | - | - | - | - | 34 |
| **CO6** | 16 | - | - | - | - | - | 16 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION –MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **24AG3028** | **Duration** | **3hrs** |
| **Course Title** | **FUNDAMENTALS OF QUANTITATIVE GENETICS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | State the Multiple Factor Hypothesis. | | CO1 | U | 1 |
| 2. | RIL stands for \_\_\_\_\_ | | CO1 | R | 1 |
| 3. | List the components of variation associated with polygenic traits. | | CO1 | U | 1 |
| 4. | What is epistatic variance? | | CO2 | U | 1 |
| 5. | Define mating design. | | CO2 | U | 1 |
| 6. | What type of breeding procedure can be adopted in self-pollinated crops for additive and non-additive gene action? | | CO2 | A | 1 |
| 7. | What is an experiment? | | CO3 | U | 1 |
| 8. | Define selection differential. | | CO3 | R | 1 |
| 9. | List the types of selection indices used in discriminant function analysis. | | CO3 | U | 1 |
| 10. | Define top cross. | | CO4 | R | 1 |
| 11. | List the biometrical techniques used to obtain epistatic variance. | | CO4 | U | 1 |
| 12. | State analysis is an extension of NCD III? Write about it briefly. | | CO4 | R | 1 |
| 13. | QTL stands for. | | CO5 | R | 1 |
| 14. | Write the characteristics of polygenic traits. | | CO5 | R | 1 |
| 15. | Define adaptability. | | CO6 | U | 1 |
| 16. | AMMI model is a combination of . | | CO6 | R | 1 |
| 17. | What type of stability does a regression coefficient of zero indicate in the Finley and Wilkinson model? | | CO6 | An | 1 |
| 18. | Write the higher-order statistic is used to study the direction of variation. | | CO1 | R | 1 |
| 19. | Write the Principal Component Analysis. | | CO2 | U | 1 |
| 20. | Calculate the total number of crosses in a partial diallel using n = 20 and s = 7. | | CO4 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate between qualitative and quantitative traits. | | CO1 | R | 5 |
| 22. | Write short note on application of biometrical techniques in crop improvement. | | CO2 | U | 5 |
| 23. | Describe the principles experimental designs. | | CO3 | U | 5 |
| 24. | Elaborate on the effect of L × T cross and describe the steps involved in L × T. | | CO4 | R | 5 |
| 25. | Detailed note on MAS (Marker-Assisted Selection) and its application in crop improvement. | | CO5 | U | 5 |
| 26. | Differentiate between path analysis and discriminant analysis. | | CO2 | R | 5 |
| 27. | List the various methods of association analysis. Explain genotypic and phenotypic correlation. | | CO1 | An | 5 |
| 28. | Write short note on mapping population and describe any three types of mapping population. | | CO4 | U | 5 |
| 29. | Explain the concept of selection. | | CO3 | U | 5 |
| 30. | Differentiate between General Combining Ability and Specific Combining Ability. | | CO4 | R | 5 |
| 31. | Describe the scaling test and its role in Generation Mean Analysis. | | CO4 | An | 5 |
| 32. | Interpret the given "What-Won-Where" biplot for yield. | | CO6 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe the Metroglyph analysis method used in genetic divergence studies. | CO2 | R | 7 |
|  | b. | Explain the techniques adopted in nature of gene action and its role in crop improvement. | CO1 | U | 8 |
|  |  |  |  |  |  |
| 34. | a. | Explain the approaches of diallel cross and describe Griffing’s Methods for Diallel Crosses. | CO4 | U | 7 |
|  | b. | Explain the techniques adopted in QTL mapping to identify the genomic regions and which mapping population would you choose. | CO5 | An | 8 |
|  |  |  |  |  |  |
| 35. | a. | Elaborate on the effect of stability models used to test how well crops adapt to different environments and explain any two of them. | CO6 | An | 8 |
|  | b. | Explain the North Carolina Designs I, II, and III. | CO4 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Analyse the interactions and variations in gene for polygenic and oligogenic traits |
| **CO2** | Apply the gene actions and biometrical approaches for identifying suitable genotypes. |
| **CO3** | Evaluate the designs of experiments and compute selection indices for trait specific programs. |
| **CO4** | Examine the results of mating designs and their implications on gene actions. |
| **CO5** | Design mapping populations for QTL analysis and marker assisted breeding. |
| **CO6** | Elucidate the effect of G x E interactions and stability models in crop improvement |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 7 | 10 |  | 5 |  |  | 22 |
| **CO2** | 12 | 8 | 1 |  |  |  | 21 |
| **CO3** | 1 | 12 |  |  |  |  | 13 |
| **CO4** | 19 | 13 |  | 6 |  |  | 38 |
| **CO5** | 2 | 5 |  | 8 |  |  | 15 |
| **CO6** | 1 | 1 |  | 14 |  |  | 16 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **24AG3029** | **Duration** | **3hrs** |
| **Course Title** | **MOLECULAR BREEDING AND BIOINFORMATICS** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is Bioinformatics? | | CO1 | U | 1 |
| 2. | Expand RAPD. | | CO1 | R | 1 |
| 3. | Define Epistasis. | | CO1 | R | 1 |
| 4. | Define Gene. | | CO2 | R | 1 |
| 5. | Bt toxin gene are isolated from\_\_\_\_\_ | | CO2 | R | 1 |
| 6. | Define Gene silencing. | | CO2 | An | 1 |
| 7. | What is Genomicsin Plant Biotechnology? | | CO3 | An | 1 |
| 8. | What is Restriction Enzymes? | | CO3 | U | 1 |
| 9. | What is Linkage map? | | CO3 | U | 1 |
| 10. | Define Allele. | | CO4 | U | 1 |
| 11. | What is Phenotyping? | | CO4 | U | 1 |
| 12. | Expand NCBI. | | CO4 | R | 1 |
| 13. | What is M13 vector? | | CO5 | R | 1 |
| 14. | What is Single Marker Approach? | | CO5 | U | 1 |
| 15. | What is Cloning? | | CO6 | U | 1 |
| 16. | Expand DArT. | | CO6 | R | 1 |
| 17. | Expand BACs. | | CO6 | R | 1 |
| 18. | Expand MALDI-TOF. | | CO1 | R | 1 |
| 19. | What is mean by microRNA (miRNA)? | | CO2 | R | 1 |
| 20. | List any two potential applications of Nanotechnology for crop improvement? | | CO4 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write notes on Statistical tools in marker analysis. | | CO1 | A | 5 |
| 22. | What is Allele mining or Eco-TILLING? Explain. | | CO2 | U | 5 |
| 23. | Write short notes on different enzymes used in DNA Recombinant technology? | | CO3 | R | 5 |
| 24. | Compare general steps in the construction of genomic and cDNA library. | | CO4 | An | 5 |
| 25. | What are Transgenic plants? Write its applications. | | CO5 | U | 5 |
| 26. | Explain physical methods of gene transfer. | | CO6 | R | 5 |
| 27. | Write short notes on Soma clonal-Variation. | | CO1 | R | 5 |
| 28. | Write short notes on Marker assisted selection (MAS). | | CO2 | R | 5 |
| 29. | What is Gene pyramiding? Explain Pyramiding of Bt genes. | | CO3 | U | 5 |
| 30. | List the salient features of Rice Genome Project. | | CO4 | An | 5 |
| 31. | Write about 2D gel electrophoresis. | | CO5 | U | 5 |
| 32. | Discuss about the steps in Proteomic Analysis. | | CO6 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the advanced genomic approaches in crop breeding. | CO1 | R | 10 |
|  | b. | Explain Recombinant DNA technology. | CO6 | U | 5 |
|  |  |  |  |  |  |
| 34. | a. | Discuss on Human genome project. | CO2 | R | 10 |
|  | b. | Write short notes on Replica plating to detect recombinant plasmids. | CO5 | U | 5 |
|  |  |  |  |  |  |
| 35. | a. | What is Molecular Markers? Classify DNA-based markers. | CO3 | An | 10 |
|  | b. | Explain Quantitative trait locus (QTL) and how is QTL Analysis Conducted? | CO4 | R | 5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Practice micropropagation methods in various crop plants. |
| **CO2** | Demonstrate the quantification and quality assessment of plant genomic DNA. |
| **CO3** | Acquire skills in application of molecular markers in breeding programs. |
| **CO4** | Apply methods on gene mapping and tagging of agronomically important traits. |
| **CO5** | Adopt advanced techniques in transferring foreign genes into plants through rapid introgression methods. |
| **CO6** | Conceptualize legal and ethical views about GMOs. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 18 | 1 | 5 | - | - | - | 24 |
| **CO2** | 18 | 5 | - | 1 | - | - | 24 |
| **CO3** | 5 | 7 | - | 11 | - | - | 23 |
| **CO4** | 6 | 2 | - | 11 | - | - | 19 |
| **CO5** | 1 | 16 | - | - | - | - | 17 |
| **CO6** | 7 | 6 | - | 5 | - | - | 18 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **24AG3030** | **Duration** | **3hrs** |
| **Course Title** | **HYBRID BREEDING** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define heterosis. | | CO1 | R | 1 |
| 2. | What is luxuriance? | | CO1 | U | 1 |
| 3. | Define hybrid. | | CO1 | R | 1 |
| 4. | What is three way cross hybrid? | | CO4 | U | 1 |
| 5. | What is double top cross? | | CO4 | U | 1 |
| 6. | Define inbred. | | CO2 | U | 1 |
| 7. | Define Apomixis. | | CO2 | R | 1 |
| 8. | Define inbreeding depression. | | CO1 | R | 1 |
| 9. | List the hybrid varieties of Pearl millet. | | CO4 | R | 1 |
| 10. | Define Genetic emasculation. | | CO4 | R | 1 |
| 11. | What is physiological basis of heterosis? | | CO3 | U | 1 |
| 12. | Differentiate homozygous and homogeneous. | | CO3 | An | 1 |
| 13. | What is genetic stocks? | | CO6 | U | 1 |
| 14. | List the clonally propagated crops. | | CO2 | R | 1 |
| 15. | Describe GM crops. | | CO5 | U | 1 |
| 16. | Define organellar heterosis. | | CO5 | R | 1 |
| 17. | What is pre mendelian concepts? | | CO3 | U | 1 |
| 18. | Heterobeltiosis is also known as---------- | | CO1 | R | 1 |
| 19. | Restorer line is referred as \_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 20. | The term heterosis was coined by \_\_\_\_\_\_\_\_\_\_ | | CO1 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain dominance theory of heterosis. | | CO3 | An | 5 |
| 22. | Highlight the main difference between dominance and over dominance theories of heterosis. | | CO3 | U | 5 |
| 23. | Classify heterosis. | | CO1 | An | 5 |
| 24. | Describe the main features of hybrids. | | CO4 | U | 5 |
| 25. | Differentiate between Synthetic and Composite variety. | | CO5 | R | 5 |
| 26. | Define Self Incompatibility. Briefly describe the classification of Self incompatibility. | | CO5 | R | 5 |
| 27. | Explain the utilization of male sterile system in pearl millet breeding. | | CO2 | A | 5 |
| 28. | Describe the various methods of hybrid seed production. | | CO4 | R | 5 |
| 29. | Explain the genetics of apomixes. | | CO5 | R | 5 |
| 30. | Explain the inheritance of CGMS. | | CO5 | R | 5 |
| 31. | Describe the molecular mechanism of male sterility. | | CO6 | U | 5 |
| 32. | Explain the maintenance breeding of parental lines in hybrids. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain about planning the Procedure of Hybridization. | CO5 | R | 8 |
|  | b. | Give a detailed note on Hybrid breeding of Cotton and Maize. | CO4 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Define male sterility. Briefly describe the classification of male sterility. | CO3 | R | 8 |
|  | b. | Explain the methods of fixation of heterosis. | CO6 | R | 7 |
|  |  |  |  |  |  |
| 35. | a. | Write a detailed note on One line method, Two line method, Three line method of Rice breeding. | CO4 | U | 8 |
|  | b. | Summarize the various steps involved in release of a new variety. | CO2 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Examine the genetic mechanisms of heterosis |
| **CO2** | Explore the evolutionary aspects of crops |
| **CO3** | Analyze the various theories of heterosis. |
| **CO4** | Differentiate the types of hybrid seed production systems |
| **CO5** | Utilize genetic stocks in hybrid development |
| **CO6** | Exploit heterosis for yield improvement through conventional and biotechnological approaches. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 4 | 2 |  | 5 |  |  | 11 |
| **CO2** | 9 | 1 | 5 |  |  |  | 15 |
| **CO3** | 8 | 7 |  | 6 |  |  | 21 |
| **CO4** | 8 | 22 |  |  |  |  | 30 |
| **CO5** | 29 | 1 |  |  |  |  | 30 |
| **CO6** | 12 | 6 |  |  |  |  | 18 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **24AG3033** | **Duration** | **3hrs** |
| **Course Title** | **BREEDING FOR STRESS RESISTANCE AND CLIMATE CHANGE** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define abiotic stress. | | CO1 | R | 1 |
| 2. | What is dehydration tolerance? | | CO1 | U | 1 |
| 3. | Write the salt tolerance. | | CO1 | R | 1 |
| 4. | Define mineral stress resistance. | | CO2 | R | 1 |
| 5. | What is somaclonal variation? | | CO3 | U | 1 |
| 6. | What is gene-for-gene relationship? | | CO4 | U | 1 |
| 7. | Define epidemic. | | CO3 | R | 1 |
| 8. | What is susceptibility? | | CO2 | U | 1 |
| 9. | Define durable insect resistancei | | CO3 | R | 1 |
| 10. | What is dominant gene? | | CO5 | U | 1 |
| 11. | Define genetic resistance. | | CO6 | R | 1 |
| 12. | Define gene deployment. | | CO4 | R | 1 |
| 13. | What is Vertifolia effect? | | CO3 | U | 1 |
| 14. | Write the common phenolics and phytoalexins. | | CO3 | R | 1 |
| 15. | Define multiline variety. | | CO2 | R | 1 |
| 16. | What is antibiosis? | | CO3 | U | 1 |
| 17. | What is ionic stress? | | CO3 | U | 1 |
| 18. | Term horizonal resistance given by…….. | | CO2 | R | 1 |
| 19. | Stress Hormone is ………. | | CO3 | U | 1 |
| 20. | The stress caused by living organisms in plants is known as ---------- | | CO1 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define stress. Classify its different types. | | CO1 | U | 5 |
| 22. | Explain the cyclic photophosphorylation | | CO1 | An | 5 |
| 23. | Write Mechanism of Insect Resistance. | | CO3 | R | 5 |
| 24. | Write about the characteristics of abiotic stresses. | | CO3 | R | 5 |
| 25. | Explain the vertical and horizontal resistance. | | CO3 | An | 5 |
| 26. | Write about components of plants resistance to insect pests. | | CO2 | R | 5 |
| 27. | Write about different breeding methodologies is resistance breeding. | | CO4 | R | 5 |
| 28. | Discuss the different mechanism of salinity resistance. | | CO2 | U | 5 |
| 29. | Explain the backcross method of breeding for disease resistance. | | CO5 | U | 5 |
| 30. | Discuss the role of growth regulators under abiotic stress conditions. | | CO2 | U | 5 |
| 31. | Explain in detail about the steps involved in RAPD. | | CO5 | An | 5 |
| 32. | Write the various general approaches for breeding varieties resistance to abiotic stress. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the functions of osmolytes under abiotic stress. | CO3 | U | 7 |
|  | b. | Discus about MAS gene pyramiding for pest and disease resistance. | CO5 | U | 8 |
|  |  |  |  |  |  |
| 34. | a. | Describe the chilling and freezing injury and their tolerance. | CO1 | U | 8 |
|  | b. | Describe the different types of biotic and abiotic stresses. | CO1 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain the activation of amino acids during protein synthesis. | CO2 | An | 8 |
|  | b. | Write detail of plant genes conferring to pest and disease in transgenic crops. | CO6 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Acquire skills in the development of breeding populations to identify elite stress-tolerant genotypes |
| **CO2** | Apply different breeding protocols to develop durable stress-tolerant varieties in plants |
| **CO3** | Evaluate the breeding materials for different types of biotic and abiotic stresses using standard screening protocols |
| **CO4** | Acquire skills in gene pyramiding and stacking techniques to enhance the stress resistance potential of the crop |
| **CO5** | Adopt marker-assisted selection to identify pyramided genotypes for stress tolerance |
| **CO6** | Apply genomic approaches to develop climate-resilient crop varieties |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 2 | 22 |  | 5 |  |  | 29 |
| **CO2** | 8 | 11 |  | 8 |  |  | 27 |
| **CO3** | 13 | 12 |  | 5 |  |  | 30 |
| **CO4** | 6 | 1 |  |  |  |  | 7 |
| **CO5** |  | 14 |  | 5 |  |  | 19 |
| **CO6** | 13 |  |  |  |  |  | 13 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **24AG3218** | **Duration** | **3hrs** |
| **Course Title** | **REMOTE SENSING AND GIS TECHNIQUES FOR SOIL AND CROP STUDIES** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | List the types of platform with example. | | CO1 | R | 1 |
| 2. | Define IFOV. | | CO1 | R | 1 |
| 3. | List two examples of commercial and open source software. | | CO1 | U | 1 |
| 4. | Expand UTM. | | CO2 | A | 1 |
| 5. | Write down the working principles of GPS. | | CO2 | R | 1 |
| 6. | What is microwave radiometer? | | CO2 | An | 1 |
| 7. | What is cartography? | | CO3 | R | 1 |
| 8. | Write any two functions of GIS. | | CO3 | A | 1 |
| 9. | List the components of precision farming. | | CO3 | A | 1 |
| 10. | Define Query. | | CO4 | R | 1 |
| 11. | What is STCR? | | CO4 | E | 1 |
| 12. | List the types of sensors’ in camera. | | CO4 | A | 1 |
| 13. | Give an example of thermal Imaging. | | CO5 | U | 1 |
| 14. | List the types of resolution. | | CO5 | C | 1 |
| 15. | List the components of GIS. | | CO6 | U | 1 |
| 16. | List the types of database Structure. | | CO6 | An | 1 |
| 17. | Define Variable Rate Technology. | | CO6 | E | 1 |
| 18. | List some crop model. | | CO1 | An | 1 |
| 19. | Give two applications of drone in precision farming. | | CO2 | A | 1 |
| 20. | Differentiate vector and raster model. | | CO4 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the different Law of Radiation. | | CO1 | R | 5 |
| 22. | Classify sensors. | | CO2 | U | 5 |
| 23. | Write the characteristics and uses of good aerial photograph. | | CO3 | U | 5 |
| 24. | Discuss the yield monitoring in crop using RS approaches. | | CO4 | A | 5 |
| 25. | Describe the identification and management of Wasteland. | | CO5 | An | 5 |
| 26. | Write a brief note on ARIS. | | CO6 | E | 5 |
| 27. | Write short note on spectral signature. | | CO1 | U | 5 |
| 28. | Differentiate multispectral and hyper spectral imaginary. | | CO2 | R | 5 |
| 29. | Explain the stages of aerial photograph. | | CO3 | E | 5 |
| 30. | Write the significance and sources of the spatial and temporal variability in soils. | | CO4 | A | 5 |
| 31. | List few applications of RS, GIS & GPS in precision farming. | | CO5 | C | 5 |
| 32. | Summarize the role of GIS in e-governance. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the interaction of light (energy) with object briefly. | CO1 | U | 9 |
|  | b. | Explain the basic process of Remote Sensing. | CO1 | R | 6 |
|  |  |  |  |  |  |
| 34. | a. | Discuss the Visual Image Interpretation of satellite imaginary. | CO2 | A | 9 |
|  | b. | Illustrate the steps involved in Digital Image processing. | CO2 | An | 6 |
|  |  |  |  |  |  |
| 35. | a. | Summarize the applications of RS techniques in land use soil survey. | CO3 | A | 9 |
|  | b. | List the applications of GIS for water resources. | CO3 | A | 6 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Comprehend the remote sensing and its components |
| **CO2** | Process and interpret aerial photographs and imageries |
| **CO3** | Prepare soil resource inventory using remote sensing techniques |
| **CO4** | Estimate crop area and forecast yield |
| **CO5** | Suggest watershed management |
| **CO6** | Assess drought condition and map land degradation |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 12 | 15 |  | 1 |  |  | 29 |
| **CO2** | 6 | 5 | 11 | 7 |  |  | 29 |
| **CO3** | 1 | 5 | 17 |  | 5 |  | 28 |
| **CO4** | 1 |  | 11 | 1 | 1 |  | 14 |
| **CO5** |  | 1 |  | 5 |  | 6 | 12 |
| **CO6** |  | 1 |  | 1 | 6 | 5 | 13 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **24AG3219** | **Duration** | **3hrs** |
| **Course Title** | **DATA ANALYSIS USING STATISTICAL PACKAGES** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | ............... is defined as the sum of observations divided by the total number of individuals added. | | CO1 | R | 1 |
| 2. | The function to calculate the mean in EXCEL is ....... | | CO1 | R | 1 |
| 3. | The bar chart made with one categorical variable in the *x* axis is ........ | | CO1 | R | 1 |
| 4. | Correlation between two unrelated variables is called ........ | | CO2 | R | 1 |
| 5. | The sum of all the residuals of a fitted regression line is always ............ | | CO2 | R | 1 |
| 6. | Define simple linear regression. | | CO2 | R | 1 |
| 7. | Define *post-hoc* test. | | CO3 | R | 1 |
| 8. | The test used to compare the sample mean with the theoretical mean in .......... | | CO3 | R | 1 |
| 9. | Test used to compare the homogeneity of more than 3 sample variances is ........ | | CO3 | R | 1 |
| 10. | Write one application of the chi-square test. | | CO5 | U | 1 |
| 11. | Justify the suitability of RCBD over CRD. | | CO4 | U | 1 |
| 12. | In ANOVA, the theoretical *F* value is selected from ...... | | CO5 | R | 1 |
| 13. | ANOVA stands for ........ | | CO3 | U | 1 |
| 14. | Number of factors in RCBD is ........ | | CO3 | C | 1 |
| 15. | List one difference between ANOVA and ANCOVA. | | CO5 | R | 1 |
| 16. | PCA is a ........... technique. | | CO3 | R | 1 |
| 17. | Define the factor in factor analysis. | | CO5 | U | 1 |
| 18. | The Probit model is used to ....... | | CO3 | R | 1 |
| 19. | Split plot design is a .... factor experiment. | | CO3 | R | 1 |
| 20. | Discriminant analysis is used to ....... | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain Kurtosis and its types with suitable graphs. | | CO1 | E | 5 |
| 22. | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | Humidity (%) | Rainfall (mm) | Nitrogen level (%) | Phosphorus level (%) | Potassium level (%) | | Yield (Kg/ha) | 0.952\*\* | -0.963\*\* | -0.895\*\* | -0.807\*\* | 0.559\*\* |   Interpret the following correlation table in the context of the yield of the crop. | | CO2 | U | 5 |
| 23. | Compare the bar diagram with histogram. | | CO3 | U | 5 |
| 24. | A researcher wants to determine if a new irrigation method improves wheat yield compared to the traditional method. The researcher collected data from 20 fields and obtained a test statistic of 2.45 with a probability value of 0.031. Test the significance at a 5% level. | | CO3 | E | 5 |
| 25. | Explain any one one-factorial design. | | CO3 | E | 5 |
| 26. | Write the test procedure for Shapiro-Wilk’s test. | | CO5 | R | 5 |
| 27. | Explain correlation and its types. | | CO4 | U | 5 |
| 28. | Write the testing procedure for the regression coefficient. | | CO2 | An | 5 |
| 29. | Explain the components of a formal hypothesis test. | | CO3 | U | 5 |
| 30. | The potato yield from 12 different farms was collected. The standard potato yield for the given variety is *μ*=20 kg.  *x* = [21.5, 24.5, 18.5, 17.2, 14.5, 23.2, 22.1, 20.5, 19.4, 18.1, 24.1, 18.5]  Test if the potato yield from these farms is significantly different from the standard yield using the following results. | | CO4 | R | 5 |
| 31. | Test whether the yield of two varieties is significantly different at the 5% level of significance using the following results. | | CO5 | An | 5 |
| 32. | Create a layout for split plot design with 3 main-plots and 2 sub-plot treatments replicated 3 times. | | CO3 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. |  | In an agricultural experiment, a researcher is studying the effects of four different fertilizers (A, B, C, D) on the yield of wheat. Using the following results, write a detailed interpretation with a proper procedure. | CO1 | An | 15 |
|  |  |  |  |  |  |
| 34. | a. | Explain any one large sample test for sample proportions. | CO2 | U | 7 |
|  | b. | List the properties of the standard normal distribution. | CO6 | A | 8 |
|  |  |  |  |  |  |
| 35. |  | In a study carried by agronomists to determine if major differences in yield response to N fertilization exist among different varieties of jowar, the main plot treatments were three varieties of jowar (V1: CO-18, V2: CO-19 and V3: C0-22), and the sub-plot treatments were N rates of 0, 30, and 60 kg/ha. Using the following results, Interpret in detail. | CO3 | U | 15 |
|  |  |  |  |  |  |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Understand the procedure for analyzing through statistical packages. |
| **CO2** | Interpretation of results obtained from analysis. |
| **CO3** | Learn new and advanced softwares for biological data analysis. |
| **CO4** | Establish start-ups for data analysis. |
| **CO5** | Analyze time series data. |
| **CO6** | Interpretation of the results of AMMI and Multivariate analysis |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 3 |  |  | 15 | 5 |  | 23 |
| **CO2** | 3 | 12 |  | 5 |  |  | 20 |
| **CO3** | 6 | 26 |  |  | 10 | 6 | 48 |
| **CO4** | 6 | 6 |  |  |  |  | 12 |
| **CO5** | 7 | 2 |  | 5 |  |  | 14 |
| **CO6** |  |  | 8 |  |  |  | 8 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **24AG4090** | **Duration** | **3hrs** |
| **Course Title** | **INFORMATION TECHNOLOGY IN AGRICULTURE** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention two examples for input devices in computer. | | CO1 | R | 1 |
| 2. | --------- computers are used for complex situations and ------ are the systems used in appliances or vehicles. | | CO1 | R | 1 |
| 3. | Expand GUI, GPS and BIOS. | | CO1 | R | 1 |
| 4. | Differentiate RAM and ROM. | | CO1 | U | 1 |
| 5. | Define megabyte and megahertz. | | CO2 | R | 1 |
| 6. | --------- is the device that allows multiple logical signals to be transmitted simultaneously across a single physical channel. | | CO2 | U | 1 |
| 7. | Define WAN and ICT. | | CO2 | R | 1 |
| 8. | List the different kinds of data. | | CO3 | R | 1 |
| 9. | List the types of softwares for data presentation. | | CO4 | R | 1 |
| 10. | What are the types of graphs utilized for data presentation? | | CO1 | U | 1 |
| 11. | Give two examples for software applications that can be used to calculate the fertilizer and nutrition requirements in crops. | | CO3 | R | 1 |
| 12. | Mention the role of e-Agriculture and the platforms for supporting e-Agriculture. | | CO3 | U | 1 |
| 13. | ----------- acts as an interface between database and user. | | CO4 | U | 1 |
| 14. | List the features of DBMS. | | CO3 | U | 1 |
| 15. | Mention two examples for database software. | | CO2 | R | 1 |
| 16. | -------- and --------- are the example for multiple devices connecting portals. | | CO1 | R | 1 |
| 17. | Define a computer virus. | | CO1 | R | 1 |
| 18. | Give two examples for utility software. | | CO1 | U | 1 |
| 19. | List the file extension of i)excel ii)word iii)batch file and iv) command interpreter. | | CO1 | R | 1 |
| 20. | Mention two examples for programming languages. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the types of computers and illustrate the importance of cloud computing. | | CO1 | R | 5 |
| 22. | Diagrammatically explain the structure of a computer and explain the role of hardware. | | CO1 | U | 5 |
| 23. | Explain the applications of MS office with its advantages and limitations. | | CO2 | U | 5 |
| 24. | Could you explain about the system you use for your research and detail its configurations and benefits? | | CO6 | A | 5 |
| 25. | Elaborate the applications of DBMS in Agriculture. | | CO2 | U | 5 |
| 26. | Describe the features and applications of Microsoft access, Microsoft excel, Microsoft publisher and Microsoft 365. | | CO2 | R | 5 |
| 27. | Describe the role of ICT in Agronomic practices. | | CO3 | U | 5 |
| 28. | How would you calculate the fertilizer and water requirement of a crop? Describe the procedure and briefly describe about the crop nutrition application software. | | CO4 | A | 5 |
| 29. | Explain about the types of operating systems utilized in the computer applications. | | CO2 | U | 5 |
| 30. | Describe the role and features of macOS along with advantages and disadvantages. | | CO4 | U | 5 |
| 31. | Describe about the different types of storages devices and their implications in data management. | | CO1 | U | 5 |
| 32. | Explain the role of geospatial technology in addressing the agricultural challenges. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Illustrate the role of ICT tools in Agriculture with success stories. | CO3 | U | 8 |
|  | b. | What is an application software? Describe the role of application software with examples. | CO2 | R | 7 |
|  |  |  |  |  |  |
| 34. | a. | Describe the applications of Smart phone apps in agriculture to support farmers. | CO5 | U | 8 |
|  | b. | How would you prepare a contingent crop planning system for farmers using IT tools? | CO6 | A | 7 |
|  |  |  |  |  |  |
| 35. | a. | Describe the features, concepts and applications of WWW. | CO3 | R | 8 |
|  | b. | Illustrate the role of computer-controlled devices for Agri-input management. | CO5 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Comprehend the basic anatomy of computers, types of operating systems, and the functions of various IT tools such as MS Office in document creation, data analysis, and graphing. |
| **CO2** | Relate the role of databases and database management systems (DBMS) in agriculture, as well as the concepts behind e-Agriculture and computer programming languages. |
| **CO3** | Apply ICT tools and computer models to calculate crop water and nutrient requirements, automate agricultural processes, and manage agri-inputs. |
| **CO4** | Analyze the impact of geospatial technology and decision support systems on agricultural decision-making, including farm management, soil information systems, and contingent crop planning. |
| **CO5** | Evaluate the effectiveness of IT applications, such as smartphone apps, for providing farm advice, market prices, and post-harvest management solutions, improving agricultural productivity and efficiency. |
| **CO6** | Create IT-based solutions, using expert systems and geospatial technology, to address specific agricultural challenges and optimize farm decision-making. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 11 | 13 | - | - | - | - | 24 |
| **CO2** | 15 | 16 | - | - | - | - | 31 |
| **CO3** | 11 | 15 | - | - | - | - | 26 |
| **CO4** | 1 | 6 | 5 | - | - | - | 12 |
| **CO5** | - | 15 | - | - | - | - | 15 |
| **CO6** | - | 5 | 12 | - | - | - | 17 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **24HO3127** | **Duration** | **3hrs** |
| **Course Title** | **TROPICAL FRUIT PRODUCTION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define sibmating. | | CO1 | R | 1 |
| 2. | Name two red-flake varieties of jackfruit. | | CO1 | R | 1 |
| 3. | What is phyllochron? | | CO1 | U | 1 |
| 4. | State the botanical name, family and origin of avocado. | | CO2 | R | 1 |
| 5. | Expand INIBAP. | | CO2 | U | 1 |
| 6. | What is phyllanthoid branching? | | CO2 | U | 1 |
| 7. | Write the botanical name of soursop and bullock heart. | | CO3 | R | 1 |
| 8. | List two mango varieties released from IARI. | | CO3 | R | 1 |
| 9. | What is bottom heat techniques? | | CO3 | U | 1 |
| 10. | Write the nutritive value of guava. | | CO4 | U | 1 |
| 11. | List different races of avocado. | | CO4 | U | 1 |
| 12. | Write the seed rate of papaya. | | CO4 | R | 1 |
| 13. | Write about ratooning in pineapple. | | CO5 | A | 1 |
| 14. | Define climacteric fruits. | | CO5 | R | 1 |
| 15. | Name any two national research institutes working on tropical fruit crops. | | CO6 | R | 1 |
| 16. | Expand HDMCS. | | CO6 | R | 1 |
| 17. | Mention the production constraints in aonla. | | CO6 | A | 1 |
| 18. | List two ber varieties released from CIAH. | | CO1 | U | 1 |
| 19. | How will you control fruit necrosis in aonla. | | CO2 | A | 1 |
| 20. | List the different groups of pineapple. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Narrate the propagation techniques of pineapple. | | CO1 | A | 5 |
| 22. | Elaborate on physiological disorders and their management practices in banana. | | CO2 | U | 5 |
| 23. | Write a short note on the propagation technique of papaya. | | CO3 | R | 5 |
| 24. | Narrate the maturity indices for banana, aonla and jackfruit. | | CO4 | An | 5 |
| 25. | Explain the flowering behaviour in avocado. | | CO5 | A | 5 |
| 26. | Explain in detail the crop regulation in guava. | | CO6 | U | 5 |
| 27. | Elaborate on cultivation aspects of jackfruit. | | CO1 | R | 5 |
| 28. | Explain the alternate bearing in mango. | | CO2 | R | 5 |
| 29. | Briefly explain the HDP in fruit crops. | | CO3 | U | 5 |
| 30. | Write the packaging techniques for tropical fruits. | | CO4 | An | 5 |
| 31. | Elaborate the training and pruning techniques in ber. | | CO5 | U | 5 |
| 32. | Describe the papain extraction techniques. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the scope and importance of tropical fruit production. | CO1 | U | 8 |
|  | b. | Narrate the role of rootstock in tropical fruit production. | CO1 | A | 7 |
|  |  |  |  |  |  |
| 34. | a. | Write in detail about the production technology of mango with special reference to propagation, HDP, training, pruning, and harvest. | CO2 | U | 8 |
|  | b. | Give a detail account on physiology of flowering, pollination management of papaya, ber and aonla. | CO2 | An | 7 |
|  |  |  |  |  |  |
| 35. | a. | Discuss the special practices followed in banana. | CO3 | A | 8 |
|  | b. | Explain in detail the crop regulation in pineapple. | CO3 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| **CO1** | Undertake production of elite planting material of tropical fruit crops with rootstocks suited for specific situations |
| **CO2** | Upgrade the traditional orchards using the knowledge obtained |
| **CO3** | Improve the quality of the final produce with application of suitable strategies |
| **CO4** | Equip with technical know-how of packing, storage and ripening of tropical fruits |
| **CO5** | Establish and manage an orchard leading to optimum and quality tropical fruit production |
| **CO6** |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 7 | 10 | 12 | - | - | - | 29 |
| **CO2** | 6 | 15 | 1 | 7 | - | - | 29 |
| **CO3** | 7 | 13 | 8 | - | - | - | 28 |
| **CO4** | 1 | 3 | - | 10 | - | - | 14 |
| **CO5** | 1 | 5 | 6 | - | - | - | 12 |
| **CO6** | 2 | 5 | 6 | - | - | - | 13 |
|  | | | | | | | **125** |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **24HO3130** | **Duration** | **3hrs** |
| **Course Title** | **BREEDING OF FRUIT CROPS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write any two introduced cultivars of mango | | CO1 | U | 1 |
| 2. | Mention any two national research institutes working on fruit breeding. | | CO1 | R | 1 |
| 3. | Write any two diploid varieties of banana. | | CO1 | U | 1 |
| 4. | Define polyploidy. | | CO2 | R | 1 |
| 5. | What is apomixes? | | CO2 | U | 1 |
| 6. | What is parthenogenesis? | | CO2 | U | 1 |
| 7. | Define selection breeding. | | CO3 | R | 1 |
| 8. | List mango varieties released from IIHR. | | CO3 | R | 1 |
| 9. | List the peach varieties. | | CO3 | R | 1 |
| 10. | Define marker gene. | | CO4 | R | 1 |
| 11. | Name any two woolly apple aphid-resistant rootstocks. | | CO4 | R | 1 |
| 12. | What is cryopreservation? | | CO4 | U | 1 |
| 13. | Define emasculation. | | CO5 | R | 1 |
| 14. | What is embryo rescue technique? | | CO5 | U | 1 |
| 15. | List the varieties of pear. | | CO6 | R | 1 |
| 16. | List the intergeneric hybrids in citrus. | | CO6 | U | 1 |
| 17. | Define anther culture. | | CO6 | R | 1 |
| 18. | Write the botanical name of strawberry and apricot. | | CO1 | R | 1 |
| 19. | What is self-incompatibility? | | CO2 | U | 1 |
| 20. | Mention the abiotic resistant rootstocks of mango. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write the problems in fruit breeding. | | CO1 | A | 5 |
| 22. | Define parthenocarpy and explain its types. | | CO2 | U | 5 |
| 23. | Describe the breeding objectives of grapes and pomegranate. | | CO3 | U | 5 |
| 24. | Explain resistance breeding for biotic stress resistance. | | CO4 | R | 5 |
| 25. | Throw light on transgenic papaya and their importance. | | CO5 | A | 5 |
| 26. | Write about hybridization techniques practiced in mango. | | CO6 | A | 5 |
| 27. | Write about the taxonomic classification of citrus. | | CO1 | U | 5 |
| 28. | Illustrate the floral biology of grapes. | | CO2 | A | 5 |
| 29. | Elaborate on the varietal wealth of papaya. | | CO3 | R | 5 |
| 30. | Narrate the genetic resources of guava and pineapple. | | CO4 | An | 5 |
| 31. | Explain the biotechnological interventions made for the improvement of fruit crops. | | CO5 | An | 5 |
| 32. | Enumerate breeding methods involved in the improvement of nut crops. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Summarize the scope and importance of fruit breeding in India. | CO1 | An | 8 |
|  | b. | Enumerate about primary and secondary centres of origin of fruit crops. | CO1 | R | 7 |
|  |  |  |  |  |  |
| 34. | a. | Explain the steps involved in the hybridization technique with diagram. | CO2 | U | 8 |
|  | b. | Narrate the breeding objectives in pineapple, litchi and apple. | CO2 | A | 7 |
|  |  |  |  |  |  |
| 35. | a. | Give an account of breeding objectives and achievements in mango. | CO3 | A | 8 |
|  | b. | Discuss mutation breeding in fruit crops. | CO3 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| **CO1** | Get acquainted with taxonomy and cytogenetics of fruit crops. |
| **CO2** | Get acquainted with blossom biology and breeding systems of fruit crops. |
| **CO3** | Develop potential hybrids using conventional and non-conventional breeding methods for development of fruit crops. |
| **CO4** | Develop resistant varieties using local genetic resources for biotic and abiotic stresses. |
| **CO5** | Apply biotechnological interventions for improvement of quality traits of fruit crops. |
| **CO6** | Develop a breeding program for production of high yielding varieties and hybrids of fruit crops. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 9 | 7 | 5 | 8 | - | - | 29 |
| **CO2** | 1 | 16 | 12 | - | - | - | 29 |
| **CO3** | 8 | 12 | 8 | - | - | - | 28 |
| **CO4** | 7 | 2 | - | 5 | - | - | 14 |
| **CO5** | 1 | 1 | 5 | 5 | - | - | 12 |
| **CO6** | 2 | 6 | 5 | - | - | - | 13 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **24HO3131** | **Duration** | **3hrs** |
| **Course Title** | **EXPORT ORIENTED FRUIT PRODUCTION** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write the importance of fruit growing. | | CO1 | U | 1 |
| 2. | Explain the export specifications for pomegranate. | | CO1 | A | 1 |
| 3. | Find out the trends in the export of major fruit crops. | | CO1 | An | 1 |
| 4. | Explain the Quality Criteria for fruit product export. | | CO2 | E | 1 |
| 5. | Define Grade designation and Grade designation mark. | | CO2 | R | 1 |
| 6. | List the particulars as may be marked on each export packages. | | CO2 | U | 1 |
| 7. | Explain the mulching of fruit crops. | | CO3 | A | 1 |
| 8. | Write the PGR application in mango for quality fruit production. | | CO3 | An | 1 |
| 9. | How will you lift and packing of fruit plants seedling? | | CO3 | A | 1 |
| 10. | Identify the characters of Fruit Crops for Protected structure. | | CO4 | C | 1 |
| 11. | List the advantages of poly tunnels. | | CO4 | U | 1 |
| 12. | Define Hi-tech greenhouse. | | CO4 | R | 1 |
| 13. | Define Nano coating and its functions. | | CO5 | R | 1 |
| 14. | Explain the value chain model. | | CO5 | An | 1 |
| 15. | Write about Codex standards for Fruits and Vegetables. | | CO6 | U | 1 |
| 16. | Define the GLOBAL GAP. | | CO6 | R | 1 |
| 17. | **What are the documents required for fruit export?** | | CO6 | U | 1 |
| 18. | Find out the export important variety of guava. | | CO1 | E | 1 |
| 19. | State the ideal Storage condition of Banana for export market. | | CO2 | C | 1 |
| 20. | Define Cold storage. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the trade scenario product-wise export of major fruits | | CO1 | A | 5 |
| 22. | Briefly explain the export standards classification of Banana. | | CO2 | U | 5 |
| 23. | Describe raising of Rootstocks in fruit nursery. | | CO3 | An | 5 |
| 24. | What are the constraints in fruit production under protected cultivation? | | CO4 | A | 5 |
| 25. | Write the applications of LED in fruit crops. | | CO5 | R | 5 |
| 26. | Describe the ISO and Codex Alimentarius Commission. | | CO6 | U | 5 |
| 27. | Give a short note on minimum requirements of Pineapple for export market. | | CO1 | C | 5 |
| 28. | List the various factors to minimize damage, contamination and deterioration during harvesting and field handling of Banana. | | CO2 | U | 5 |
| 29. | Write about the principle of crop regulation. | | CO3 | An | 5 |
| 30. | Elaborate the various types of protected structure for fruit production green houses. | | CO4 | R | 5 |
| 31. | Write the importance and applications of packing. | | CO5 | E | 5 |
| 32. | Brief the Hazard Analysis and Critical Control Point system. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the Fruit export promotion zone in India. | CO1 | R | 8 |
|  | b. | Write the Grade designation and quality of mango. | CO2 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Elaborate the Post-harvest technology of Banana for export market. | CO3 | A | 8 |
|  | b. | Write in detail the Crop regulation techniques for quality guava fruit production. | CO4 | An | 7 |
|  |  |  |  |  |  |
| 35. | a. | Give a detailed account on Post-harvest handling of fruits for export. | CO5 | C | 8 |
|  | b. | Brief the Sanitary and Phytosanitary requirements and quality standards. | CO6 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Get acquainted with the national and international trade scenario of fruit crops. |
| **CO2** | Apply the norms and standards to meet the export requirements of fruit crops. |
| **CO3** | Apply necessary techniques required for quality fruit production |
| **CO4** | Set up the required infrastructure and facilities for fruit production under protected cultivation |
| **CO5** | Gain expertise in postharvest management and supply chain of horticultural produce for export. |
| **CO6** | Get acquainted with phytosanitary requirements and application procedures for export of fruits |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 15 | 1 | 6 | 1 | 1 | 5 | 29 |
| **CO2** | 1 | 11 | - | - | 1 | 1 | 14 |
| **CO3** | - | - | 17 | 11 | - | - | 28 |
| **CO4** | 7 | 1 | 5 | - | - | 1 | 14 |
| **CO5** | 6 | - | - | 1 | 5 | 15 | 27 |
| **CO6** | 1 | 12 | - | - | - | - | 13 |
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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **24HO3132** | **Duration** | **3hrs** |
| **Course Title** | **CANOPY MANAGEMENT OF FRUIT CROPS** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write short note on Open-centre System. | | CO1 | R | 1 |
| 2. | Define Apical dominance. | | CO1 | U | 1 |
| 3. | Define Ringing or girdling. | | CO1 | U | 1 |
| 4. | What are the tools required for canopy management? | | CO2 | A | 1 |
| 5. | Explain Skirting. | | CO2 | U | 1 |
| 6. | Explain the physiology behind training and pruning. | | CO2 | An | 1 |
| 7. | How will you care of pruned wounds? | | CO3 | E | 1 |
| 8. | Write about the growth habits in fruit plants. | | CO3 | R | 1 |
| 9. | Define Nicking. | | CO3 | U | 1 |
| 10. | Write the Applications of dwarfing fruit trees. | | CO4 | E | 1 |
| 11. | Write the use of dwarfing root stock/interstock. | | CO4 | C | 1 |
| 12. | Mention the methods to achieve dwarfism. | | CO4 | U | 1 |
| 13. | List the uses of PGR in canopy management. | | CO5 | R | 1 |
| 14. | What is the role of Gibberellic acid crop regulation of fruit crops? | | CO5 | An | 1 |
| 15. | Explain the meadow orchard system of Guava. | | CO6 | E | 1 |
| 16. | Define Crotch and Leader. | | CO6 | U | 1 |
| 17. | Explain the summer pruning. | | CO6 | R | 1 |
| 18. | What is Kniffin system? | | CO1 | A | 1 |
| 19. | Define canopy management. | | CO2 | U | 1 |
| 20. | Mention the ideal canopy architecture. | | CO3 | C | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the Canopy management of Pomegranate. | | CO1 | A | 5 |
| 22. | List the advantages of training systems. | | CO2 | R | 5 |
| 23. | Describe the principles of Canopy Management. | | CO3 | U | 5 |
| 24. | List the important dwarfing rootstocks of fruit crops. | | CO4 | R | 5 |
| 25. | Explain the plant training systems for the peach cultivar. | | CO5 | U | 5 |
| 26. | Describe the light interception under different HDP and Training system. | | CO6 | E | 5 |
| 27. | Discuss the canopy management of Jackfruit. | | CO1 | U | 5 |
| 28. | Explain the influences of Photo-morphogenesis in the aspects of plant growth. | | CO2 | An | 5 |
| 29. | How will you manage the canopies of mango tree to improve the fruit quality? | | CO3 | A | 5 |
| 30. | Explain the physiology of dwarfism mechanism. | | CO4 | An | 5 |
| 31. | Discuss the influence of growth regulators on canopy management of fruit crops. | | CO5 | C | 5 |
| 32. | Describe the canopy management in ultra high density planting (UHDP) Orchards. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Mention the different Canopy Structures of fruit trees. | CO1 | R | 8 |
|  | b. | Write the importance of canopy management. | CO2 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Briefly explain the effect of light on fruit yield and fruit quality in fruit crops. | CO2 | An | 8 |
|  | b. | Give detail account on Pruning, objectives and types. | CO3 | C | 7 |
|  |  |  |  |  |  |
| 35. | a. | Write the physiological processes of root stock inducing dwarfness. | CO4 | E | 8 |
|  | b. | Discuss the role of growth inhibitors for canopy management. | CO5 | C | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| **CO1** | Get acquainted with canopy types and structures of fruit crops and their management. |
| **CO2** | Get acquainted with the factors affecting canopy management of fruit crops |
| **CO3** | Apply the principles of canopy management of fruit crops for yield improvement |
| **CO4** | Exploit the dwarfing rootstocks in canopy management of fruit crops. |
| **CO5** | Undertake canopy management of fruit crops by application of growth regulators |
| **CO6** | Design planting system for fruit crops based on the different canopy styles |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| **CO / BL** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| **CO1** | 16 | 7 | 6 | - | - | - | 29 |
| **CO2** | 5 | 2 | 1 | 21 | - | - | 29 |
| **CO3** | 1 | 6 | 5 | - | 1 | 1 | 14 |
| **CO4** | 5 | 1 | - | 5 | 16 | 1 | 28 |
| **CO5** | 1 | 5 | - | 1 | - | 5 | 12 |
| **CO6** | 1 | 1 | - | - | 6 | 5 | 13 |
|  | | | | | | | **125** |