**SRM VALLIAMMAI ENGINEERING COLLEGE**
**(An Autonomous Institution)**

SRM Nagar, Kattankulathur – 603 203

**DEPARTMENT OF AGRICULTURE ENGINEERING**

**QUESTION BANK**

**V SEMESTER**

**1902502 FARM MACHINERY AND EQUIPMENT**
**Regulation – 2019**
**Academic Year 2022 – 2023**

*Prepared by*

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**SUBJECT:FARM MACHINERY AND EQUIPMENT**
**SEM / YEAR : 05 /III**

## UNIT-I: FARM MECHANIZATION

Farm mechanization - objectives. Tillage - objectives - methods - primary tillage implements - secondary tillage implements - animal drawn ploughs - construction. Types of farm implements - trailed, mounted. Field capacity - forces acting on tillage tool.

**PART - A**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | What is Farm Mechanization? | BT-1 | Remembering |
| 2. | List out the benefits of Farm Mechanization. | BT-2 | Understanding |
| 3. | Define tillage. | BT-1 | Remembering |
| 4. | What are the Objectives of tillage? | BT-2 | Understanding |
| 5. | What are the objectives of farm mechanization? | BT-1 | Remembering |
| 6. | Distinguish benefits and limitations of farm mechanization | BT-3 | Applying |
| 7. | What are the different sources of farm power? | BT-2 | Understanding |
| 8. | List out the scope of farm mechanization? | BT-1 | Remembering |
| 9. | Define tillage? | BT-1 | Remembering |
| 10. | Classify farm machines. | BT-3 | Applying |
| 11. | List out the primary Tillage implements | BT-1 | Remembering |
| 12. | Write down the parts of indigenous plough. | BT-3 | Applying |
| 13. | What are the secondary tillage implements? | BT-2 | Understanding |
| 14. | What is primary tillage? | BT-1 | Remembering |
| 15. | Define secondary tillage. | BT-1 | Remembering |
| 16. | What are the forces acting on tillage implements? | BT-2 | Understanding |
| 17. | Define Field Capacity. | BT-2 | Understanding |
| 18. | List out the factors affecting tillage implements forces. | BT-1 | Remembering |
| 19. | Write down the formula for field capacity. | BT-2 | Understanding |
| 20. | Define field efficiency of a farm implement. | BT-1 | Remembering |
| 21. | What is machinery? | BT-3 | Applying |
| 22. | Write the difference between tools and implement. | BT-2 | Understanding |
| 23. | List out the trailed farm implements. | BT-3 | Applying |
| 24. | Differentiate trailed and mounted implement. | BT-3 | Applying |
| 25. | Write down the limitations of Farm mechanization. | BT-2 | Understanding |

**PART – B**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | What do you mean by draft? Write formula for calculation of draft. | BT-3 | Applying |
| 2. | Illustrate primary tillage practices. | BT-4 | Analysing |
| 3. | Detail the tillage methods. | BT-3 | Applying |
| 4. | Brief about secondary tillage and its implements. | BT-3 | Applying |
| 5. | Explain in briefly about classification and types of tillage. | BT-5 | Evaluating |
| 6. | Differentiate primary and secondary tillage. | BT-5 | Evaluating |
| 7. | Brief about the factors affecting draft? | BT-1 | Remembering |
| 8. | Draw animal drawn mouldboard plough with neat sketch. | BT-5 | Evaluating |
| 9. | Discuss about conservation tillage. | BT-4 | Analysing |
| 10. | Detail about bottlenecks in Indian Farm Mechanization. | BT-4 | Analysing |
| 11. | Brief about types of farm implements. | BT-4 | Analysing |
| 12. | How will you calculate the forces acting on tillage implements? | BT-5 | Evaluating |
| 13. | Differentiate animal drawn indigenous and animal drawn mouldboard plough. | BT-4 | Analysing |
| 14. | Give your inputs to improve farm mechanization in India. | BT-3 | Applying |
| 15. | Detail about furrow parts with neat sketch. | BT-3 | Applying |
| 16. | Determine TFC for a machine that travels at 5.0 kmph and has an operating width of 20 m. | BT-5 | Evaluating |
| 17. | Summarize the terms related to field performance of machines. | BT-3 | Applying |

**PART-C**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | Criticize different sources of farm power in India. | BT-5 | Evaluating |
| 2. | Illustrate pattern of methods of ploughing. | BT-5 | Evaluating |
| 3. | Explain indigenous plough and its construction. | BT-3 | Applying |
| 4. | Discuss the forces acting on tillage tool | BT-5 | Evaluating |
| 5. | A farmer purchased a 35 hp wheel type tractor at a total cost of Rs. 1,50,000/- and three bottom plough with 30 cm bottom width at Rs. 6000/-. The fuel consumption of tractor was 6 l/h at plough speed of 5 km/h. | BT-5 | Evaluating |

## UNIT-II: PRIMARY AND SECONDARY TILLAGE IMPLEMENTS

Mould board plough- attachments - mould board shapes and types. Disc plough - force representation on disc - Types of disc ploughs –Subsoiler plough - Rotary plough. Cultivators - types - construction. Disc harrows - Bund former – ridger- leveller. Basinlister-Wetland preparation implements.

## PART - A

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | What is mouldboard plough? | BT-1 | Remembering |
| 2. | List out the types of disc plough. | BT-3 | Applying |
| 3. | Write down the functions of cultivators. | BT-1 | Remembering |
| 4. | What is the purpose of basinlister? | BT-1 | Remembering |
| 5. | Sub divide the mouldboard types. | BT-3 | Applying |
| 6. | Write the classification of MB plough. | BT-2 | Understanding |
| 7. | What are the types of disc harrows? | BT-2 | Understanding |
| 8. | Write about subsoiler plough | BT-3 | Applying |
| 9. | Define tilt angle. | BT-1 | Remembering |
| 10. | Write the uses of blade harrow. | BT-3 | Applying |
| 11. | List the MB plough accessories. | BT-2 | Understanding |
| 12. | Write down the uses of bund former. | BT-1 | Remembering |
| 13. | What are the Forces acting on disc plough? | BT-1 | Remembering |
| 14. | What is disc angle? | BT-2 | Understanding |
| 15. | List out the importance of levellers. | BT-2 | Understanding |
| 16. | List out the types of shares in MB plough. | BT-2 | Understanding |
| 17. | Write down the wetland implements. | BT-1 | Remembering |
| 18. | What are the cultivator components? | BT-1 | Remembering |
| 19. | Give importance of share. | BT-2 | Understanding |
| 20. | Write down the parts of mouldboard bottom. | BT-3 | Applying |
| 21 | What are the functions of cultivator? | BT-2 | Understanding |
| 22 | Draw share part and label it. | BT-3 | Applying |
| 23 | Write the merits of MB plough. | BT-2 | Understanding |
| 24 | Why do we need intercultural implements? | BT-3 | Applying |
| 25 | What HP is necessary for pulling a harrow with 50 tynes each giving a resistance of 1 Kg. when speed of harrow is 5 km/hr. | BT-3 | Applying |

## PART – B

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | Discuss about spring tooth harrow and spike tooth harrow? | BT-4 | Analysing |
| 2. | Distinguish between mould board plough and disc plough with neat sketches | BT-5 | Evaluating |
| 3. | Where do you use disc harrow? Explain about different types of disc harrow. | BT-4 | Analysing |
| 4. | Discuss about jointer. | BT-4 | Analysing |
| 5. | Explain in briefly about accessories of mould board plough. | BT-4 | Analysing |

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| 6. | Illustrate about advantage and disadvantages of disc plough? | BT-3 | Applying |
| 7. | Describe different parts of MB Plough with the help of neat sketch. | BT-4 | Understanding |
| 8. | Distinguish between standard disc plough and vertical disc plough. | BT-5 | Evaluating |
| 9. | Write short notes on Coulter. | BT-2 | Understanding |
| 10. | Detail the plough accessories. | BT-5 | Evaluating |
| 11. | Draw a neat sketch of cultivator and name it. | BT-2 | Understanding |
| 12. | Brief about intercultural implements. | BT-4 | Analysing |
| 13. | Discuss about MB plough adjustments. | BT-3 | Applying |
| 14. | Write short notes on chisel plough. | BT-2 | Understanding |
| `15. | Compare and contrast different types of mouldboard with neat sketch. | BT-3 | Analysing |
| 16. | Explain different types of share with neat sketch. | BT-4 | Analysing |
| 17. | Describe the various parts of disc harrows. | BT-4 | Understanding |

**PART-C**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | Detail about the types of disc plough. | BT-5 | Understanding |
| 2. | Explain about components of Mould board plough with the help of a diagram. | BT-3 | Applying |
| 3. | Discuss about cultivator types and construction. | BT-4 | Analysing |
| 4. | Detail about subsoiler and rotary plough. | BT-5 | Evaluating |
| 5. | Elaborate different types of harrows with neat sketch. | BT-2 | Understanding |

## UNIT-III: SOWING AND FERTILIZING EQUIPMENT

Crop planting - methods - row crop planting systems - Devices for metering seeds – furrow openers – furrow closers- types – Types of seed drills and planters – calibration- fertilizer metering devices - seed cum fertilizer drills – paddy transplanters – nursery tray machines.

**PART - A**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | What are the different types of furrow openers used in a seed planter? | BT-2 | Understanding |
| 2. | Define calibration of seeddrill. | BT-1 | Remembering |
| 3. | Write the commonly used fertilizer metering mechanisms? | BT-2 | Understanding |
| 4. | What do you mean by check row planting? | BT-1 | Remembering |
| 5. | List out the advantages of transplanting. | BT-2 | Understanding |
| 6. | Mention the main components of a seed cum fertilizer drill. | BT-2 | Understanding |

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|---|---|---|---|
| 7. | How will you make adjustments in the seed drills? | BT-2 | Understanding |
| 8. | Brief some commonly used fertilizer metering mechanisms? | BT-2 | Understanding |
| 9. | Write the function of crop planting? | BT-3 | Applying |
| 10. | Explain the need for calibration of seed drill? | BT-1 | Remembering |
| 11. | State different methods of sowing? | BT-2 | Understanding |
| 12. | How drilling can be done in field? | BT-2 | Understanding |
| 13. | What do you mean by lister planting? | BT-1 | Understanding |
| 14. | Write the components of seed drill? | BT-1 | Remembering |
| 15. | Categorize seed metering mechanisms. | BT-1 | Remembering |
| 16. | What are the parts of furrow opener? | BT-1 | Remembering |
| 17. | Summarize the objectives of planting? | BT-3 | Applying |
| 18. | Demonstrate the functions of seed planter. | BT-2 | Understanding |
| 19. | Define precision planting. | BT-1 | Remembering |
| 20. | Give formula for width of seed drill. | BT-1 | Remembering |
| 21 | What are components of Chinese Rice transplanter. | BT-3 | Applying |
| 22 | Write the various types of paddy transplanter. | BT-1 | Remembering |
| 23 | State the purpose of transplanter? | BT-3 | Applying |
| 24 | Write the effect of planter on emergence factors. | BT-3 | Applying |
| 25 | List out the factors affecting germination. | BT-2 | Understanding |

**PART – B**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | What is a seed drill? What are its functions? | BT-2 | Understanding |
| 2. | Explain about the steps to be followed for calibration of seed drill or seed-cum fertilizer drill. | BT-5 | Evaluating |
| 3. | With neat sketch explain about manual operated paddy transplanter. | BT-4 | Analysing |
| 4. | Briefly explain about bucket type sprayer with the help of a diagram | BT-6 | Creating |
| 5. | Brief about fluted feed type metering mechanism? | BT-3 | Applying |
| 6. | Explain in briefly about different types of seedling mat transplanter. | BT-4 | Analysing |
| 7. | Distinguish between seed drill and seed cum fertilizer drill | BT-3 | Analysing |
| 8. | What are the functions of furrow openers in seed drill? Explain in briefly about different types of furrow openers | BT-5 | Evaluating |
| 9. | Explain about seed cum fertilizer drill | BT-4 | Analysing |
| 10. | List out the steps involved in preparing mat nursery. | BT-4 | Analysing |
| 11. | Explain the working principle and adjustments in transplanter | BT-2 | Understanding |
| 12. | Write about paddy transplanter components and function. | BT-4 | Analysing |

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|---|---|---|---|
| 13. | Brief about the devices for metering single seeds. | BT-3 | Applying |
| 14. | Discuss briefly about any two types of furrow openers with the help of diagrams. | BT-2 | Understanding |
| 15. | Summarize Japanese paddy transplanter components and its function. | BT-3 | Applying |
| 16. | Detail potato planter functions with neat sketch. | BT-3 | Applying |
| 17. | Calculate the cost of sowing one hectare of land with a bullock drawn seed drill of size5 x 22 cm. The speed of bullocks is 3 km/hr. Hire charge for bullocks is Rs.100/- perpair/ day, hire charge for seed drill is Rs.50 /- per day and wages for operator isRs.100/- per day of 8 hours. | BT-3 | Applying |

**PART-C**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | Explain the various methods of sowing? Explain it. | BT-2 | Understanding |
| 2. | Explain the working principle and adjustments in power operated paddy transplanter. | BT-4 | Analysing |
| 3. | Explain about different types of transplanters used for paddy transplanting. | BT-3 | Applying |
| 4. | The following results were obtained while calibrating a seed drill. Calculate the seed rate per hectare. (i) No. of furrows = 10 (ii) Spacing between furrows = 20 cm (iii) Diameter of drive wheel = 1.5 meter (iv) RPM = 500 (v) seed collected = 20 kg. | BT-3 | Applying |
| 5. | Calculate the seed rate of a 7 x 17 cm seed drill whose main drive wheel diameter is124 cm and total weight of grain collected in 20 revolutions is 0.423 kg. | BT-3 | Applying |

## UNIT-IV: WEEDING AND PLANT PROTECTION EQUIPMENT

Weeding equipment – hand hoe – long handled weeding tools – dry land star weeder – wetland conoweeder and rotary weeder – Engine operated and tractor weeders Sprayers –types-classification – methods of atomization, spray application rate, droplet size determination – volume median diameter, numerical median diameter – drift control.

**PART – A**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1 | Name the equipment used for weeding? | BT-1 | Remembering |
| 2 | List out engine operated weeders | BT-1 | Remembering |
| 3 | State the term droplet size. | BT-2 | Understanding |

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|---|---|---|---|
| 4 | Define drift. | BT-4 | Analysing |
| 5 | How will you classify tractor operated weeders? | BT-4 | Analysing |
| 6 | What are the components of conoweeder. | BT-1 | Remembering |
| 7 | Categorize weeders. | BT-4 | Analysing |
| 8 | Define spray application rate of a sprayer. | BT-2 | Understanding |
| 9 | List out the methods forcontrolling weeds. | BT-2 | Understanding |
| 10 | Draw a neat sketch of dryland weeder. | BT-2 | Understanding |
| 11 | What are the types of sprayers? | BT-4 | Analysing |
| 12 | State any three uses of sprayers. | BT-1 | Remembering |
| 13 | Describe functions of sprayer? | BT-3 | Applying |
| 14 | Demonstrate the principle of atomizing device. | BT-4 | Analysing |
| 15 | Classify sprayers according to volume. | BT-2 | Understanding |
| 16 | Explain about centrifugal atomization. | BT-2 | Understanding |
| 17 | Define the term volume median diameter (VMD). | BT-4 | Analysing |
| 18 | List out the factors affecting drift. | BT-5 | Evaluating |
| 19 | Write down the nozzle parts. | BT-2 | Understand |
| 20 | What do you understand about boom? | BT-1 | Remembering |
| 21 | Give the functions of spray gun. | BT-1 | Remembering |
| 22 | Criticize the factors to identify the good quality sprayer. | BT-2 | Understanding |
| 23 | List out the functions of weeders. | BT-5 | Evaluating |
| 24 | What are the chemical herbicides used for weeding? | BT-1 | Remembering |
| 25 | Write basic components of sprayer. | BT-4 | Analysing |

**PART B**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1 | What are the functions of sprayers? Explain its application. | BT-5 | Evaluating |
| 2 | Discuss about nozzle component of sprayer with neat sketch. | BT-1 | Remembering |
| 3 | Explain about basic components of sprayer. | BT-2 | Understanding |
| 4 | Differentiate knapsack sprayer and power sprayer. | BT-2 | Understanding |
| 5 | Explain any five types of weeders and its uses | BT-4 | Analysing |
| 6 | Brief about different types of fertilizer application equipment. | BT-1 | Remembering |
| 7 | Demonstrate various fertilizer metering mechanisms. | BT-2 | Understanding |
| 8 | Explain any five types of sprayers and its uses. | BT-3 | Applying |
| 9 | Categorize and explain types of sprayers with respect to volume. | BT-5 | Evaluating |
| 10 | Mention the important components of a power knapsack sprayer | BT-5 | Evaluating |
| 11 | Why petrol engines are used in power knapsack sprayers? | BT-4 | Analysing |
| 12 | Brief the particle size in relation to effectiveness of drift. | BT-4 | Analysing |
| 13 | Distinguish spring loaded tynes and rigid tynes. | BT-4 | Analysing |

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| 14 | Explain about duck-foot cultivator. | BT-1 | Remembering |
| 15 | Write short notes on atomization and its types. | BT-1 | Remembering |
| 16 | Brief about hydraulic jet atomizer with neat sketch. | BT-4 | Analysing |
| 17 | Detail calibration procedure for sprayers. | BT-3 | Applying |

**PART – C**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1 | Elaborate the different types of sprayers in detail with sketch. | BT-2 | Understanding |
| 2 | Explain the working principles of a knapsack power operated sprayer | BT-3 | Applying |
| 3 | Detail the components of power sprayer. | BT-5 | Evaluating |
| 4. | Discuss the factors affecting drift. | BT-4 | Analysing |
| 5. | Brief about centrifugal atomizer types,componentsand its functions. | BT-4 | Analysing |

**UNIT-V: HARVESTING MACHINERY**

Principles of cutting crop, types of harvesting machinery, vertical conveyor reaper and binder combine harvesters, balers, threshers, tractor on top combine harvester, combine losses.

**PART – A**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1 | What is harvesting Machinery? | BT-1 | Remembering |
| 2 | How reaper binder is different from vertical conveyor reaper explain? | BT-3 | Applying |
| 3 | Discuss about adjustments of shear and impact cutting mechanism | BT-2 | Understanding |
| 4 | What are the advantages and disadvantages of combines over threshing? | BT-2 | Understand |
| 5 | What are the factors affecting thresher performance. | BT-6 | Creating |
| 6 | Mention the operations carried out by a combine harvester. | BT-6 | Creating |
| 7 | What are the principles of cutting crop? | BT-4 | Analysing |
| 8 | Write down the different types of threshers. | BT-2 | Understanding |
| 9 | List out the types of harvesting machinery. | BT-4 | Analysing |
| 10 | What are the losse involved in combine harvester? | BT-4 | Analysing |
| 11 | What are the care and maintenance in case of reapers? | BT-1 | Remembering |
| 12 | List out the types of threshing cylinders. | BT-2 | Understanding |
| 13 | What is combine loss? | BT-3 | Applying |
| 14 | Write the purpose of balers. | BT-1 | Remembering |
| 15 | Write the functions of tractor on top combine harvester | BT-2 | Understanding |
| 16 | In what ways harvesting can be done? | BT-1 | Remembering |

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|---|---|---|---|
| 17 | Write the types of reaper. | BT-1 | Remembering |
| 18 | What are the components of reapers? | BT-3 | Applying |
| 19 | Define sieve loss. | BT-3 | Applying |
| 20 | Write the reel adjustment requirement. | BT-2 | Understanding |
| 21 | What is header loss? | BT-2 | Understanding |
| 22 | Write the formula for grain crackage. | BT-1 | Remembering |
| 23 | List out the range for different combine losses. | BT-2 | Understanding |
| 24 | What are the actions involved in cutting of plant. | BT-3 | Applying |
| 25 | List out the parts of combine harvester. | BT-1 | Remembering |

**PART-B**

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1 | Explain impact type cutters and flail mowers. | BT-2 | Understanding |
| 2 | What is earth moving machine? Write its applications in agriculture? | BT-2 | Understanding |
| 3 | How reaper binder is different from vertical conveyor reaper explain? | BT-1 | Remembering |
| 4 | What are the functional components of a combine? Explain about separation and cleaning unit. | BT-2 | Understanding |
| 5 | Detail about different types of threshing cylinders. | BT-2 | Understanding |
| 6. | Write short notes on Balers. | BT-1 | Remembering |
| 7 | Discuss about the functions of binders. | BT-1 | Remembering |
| 8 | Criticize the factors cause for combine losses. | BT-3 | Applying |
| 9 | Briefly discuss about different combine losses. | BT-3 | Applying |
| 10 | Discuss about thresher components and its function. | BT-3 | Applying |
| 11 | Explain about combine harvester function and its uses. | BT-2 | Understanding |
| 12 | Detail about threshing losses. | BT-2 | Understanding |
| 13 | Brief about vertical conveyor reaper. | BT-1 | Remembering |
| 14 | Discuss binder types,functions, and its uses. | BT-3 | Applying |
| 15 | Write short note on balancing reciprocating mass. | BT-1 | Remembering |
| 16 | Criticize cutting speed requirement for reapers. | BT-5 | Evaluating |
| 17 | Mention ideal requirements and constraints of combine harvester. | BT-1 | Remembering |

## PART – C

| Q.NO | QUESTIONS | BT LEVEL | COMPETENCE |
|---|---|---|---|
| 1. | Explain the working principle of groundnut harvester with neat diagram. | BT-3 | Applying |
| 2. | What are the factors affecting mechanical cotton harvesting? How do they affect them? | BT-2 | Understanding |
| 3. | Explain different types of threshing cylinders. | BT-2 | Understanding |
| 4. | Detail about tractor top combine harvester with neat sketch. | BT-1 | Remembering |
| 5. | A combine was tested for harvesting jowar and following observations were recorded:<br>• Total area harvested = 78 sq. m.<br>• Total time required = 65 seconds.<br>• Total material left over the rack =18 kg.<br>• Free seed over the rack =150 gms.<br>• Unthreshed seed over the rack = 120 gms.<br>• Free seed over the shoe = 530 gms.<br>• Unthreshed seed over shoe = 150 gms.<br>• Total material left over shoes = 8 kg.<br>• Net grain collected in the tank = 34 kg.<br><u>Calculate:</u><br>1. Seed yield and total loss in kg/hectare.<br>2. Cylinder loss, rack loss, shoe loss and total grain loss as percent of total yield.<br>3. Total feed rate in kg/hour.<br>4. Rates of straw and chaff over the rack and over the shoe in kg/hr.<br>5. Percentage of straw and chaff retained by rack. | BT-3 | Applying |