

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

SRM Nagar, Kattankulathur – 603 203

**DEPARTMENT OF AGRICULTURAL ENGINEERING**

**QUESTION BANK**



**IV SEMESTER**

**AG3461 – TRACTORS AND FARM ENGINES**

**Regulation–2023**

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*Prepared by*

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DEPARTMENT OF MECHANICAL ENGINEERING

**QUESTION BANK**

**SUBJECT NAME : TRACTORS AND FARM ENGINES**

**Sem / Year: IV / II**

**UNIT 1: TRACTORS**

Classification of tractors – Tractor engines – Construction of engine blocks, cylinder head and crankcase – Features of cylinder, piston, connecting rod and crankshaft – Firing order combustion chambers.

**PART-A**

| Q.No. | Questions   | BT Level | Competence    |
|-------|---|----------|---------------|
| 1.    | Define 'off road vehicle'. Give examples.   | BT-1     | Remembering   |
| 2.    | Give the classification of tractor.   | BT-2     | Understanding |
| 3.    | Discover the factors we need to consider while selecting the tractor.             | BT-3     | Applying      |
| 4.    | Infer where the crawler tractors are preferred in farm activities.                | BT-4     | Analyzing     |
| 5.    | Show the purposes of ploughing.   | BT-3     | Applying      |
| 6.    | Name the basic components of tractor.   | BT-1     | Remembering   |
| 7.    | What is an I.C. Engine? Give its types.   | BT-1     | Remembering   |
| 8.    | Differentiate Internal Combustion and External Combustion engine.                 | BT-2     | Understanding |
| 9.    | What is clearance volume?   | BT-1     | Remembering   |
| 10.   | Define compression ratio of an engine.  | BT-1     | Remembering   |
| 11.   | What is the major function of an engine cylinder?                                 | BT-2     | Understanding |
| 12.   | Give the primary function of crankshaft.  | BT-2     | Understanding |
| 13.   | What are the materials used for crank shaft and connecting rod in tractor engine? | BT-1     | Remembering   |
| 14.   | Define swept volume.  | BT-1     | Remembering   |
| 15.   | List the parts of engine piston.  | BT-1     | Remembering   |

|     |   |      |               |
|-----|---|------|---------------|
| 16. | What is meant by firing order of an IC engine?              | BT-2 | Understanding |
| 17. | Which fuel engine is efficient for farm operations and why? | BT-6 | Creating      |
| 18. | List at least four benefits of farm mechanization.          | BT-1 | Remembering   |
| 19. | What are the farm powers in India?                          | BT-2 | Understanding |
| 20. | List the firing orders of six cylinder diesel engine.       | BT-1 | Remembering   |
| 21. | Classification of tractors Based on structural Design?      | BT-1 | Remembering   |
| 22. | What are the components presents in the wheel tractor?      | BT-2 | Understanding |
| 23. | What is the function of cylinder head in the IC Engine?     | BT-2 | Understanding |
| 24. | Define Combustion Chamber (CC)?                             | BT-1 | Remembering   |

**PART-B**

| Q.No | Questions  | BT Level | Competence    |
|------|--|----------|---------------|
| 1.   | What are the sources of farm power in India? What are the importance of animal power and tractor power in India?   | BT-2     | Understanding |
| 2.   | How will you classify tractors? Describe their utility on various farms.   | BT-3     | Applying      |
| 3.   | Explain the basic construction of tractor with neat sketch.  | BT-3     | Applying      |
| 4.   | Explain the constructional details of an engine block.   | BT-4     | Analyzing     |
| 5.   | Illustrate different components if IC engine with diagram.   | BT-3     | Applying      |
| 6.   | Explain about various types of piston with neat diagram.   | BT-4     | Analyzing     |
| 7.   | Briefly explain about various types of piston failures.  | BT-3     | Applying      |
| 8.   | Write short notes on working of four stroke SI engine with sketch.   | BT-2     | Understanding |
| 9.   | Discuss about the working of two stroke CI engine with neat diagram.   | BT-2     | Understanding |
| 10.  | Compare petrol and diesel engine.  | BT-4     | Analyzing     |
| 11.  | An engine has a cylinder 10 cm. The length of the stroke is also 10 cm. Find the piston swept volume. If the clearance is 1/5 of the swept volume. Find the cylinder volume and compression ratio. | BT-4     | Analyzing     |
| 12.  | List the advantages and disadvantages of two stroke cycle over four stroke cycle engine.   | BT-1     | Remembering   |

|     |  |      |               |
|-----|--|------|---------------|
| 13. | A three cylinder 4-stroke engine develops 32 bhp, when the cylinder bore is 9 cm, stroke = 12.5 cm, compression ratio = 16.5: 1, engine speed = 2000 rpm and mechanical efficiency = 80%. Calculate                            | BT-4 | Analyzing     |
|     | <ul style="list-style-type: none"> <li>(i) Piston displacement</li> <li>(ii) Displacement volume</li> <li>(iii) Piston speed</li> <li>(iv) Stroke-bore ratio</li> <li>(v) BMEP</li> <li>(vi) IHP</li> <li>(vii) FHP</li> </ul> |      |               |
| 14. | A 4 cylinder 4 stroke diesel engine has cylinder diameter 60 mm and stroke 98mm. What is the total volume of air sucked in cm <sup>3</sup> is 100 revolutions of the engine?   | BT-4 | Analyzing     |
| 15. | What are the factors consider for to select the form tractors?   | BT-2 | Understanding |
| 16. | Write short notes on working of Two stroke SI engine with sketch.  | BT-2 | Understanding |
| 17. | Discuss about the working of Four stroke CI engine with neat diagram.  | BT-2 | Understanding |

**PART-C**

|    |   |      |               |
|----|---|------|---------------|
| 1. | Discuss the status and challenges of farm mechanization in India.                             | BT-2 | Understanding |
| 2. | Explain the overhead cost estimation procedure for farm machineries.                          | BT-3 | Applying      |
| 3. | Discuss the merits and demerits of using more machinery in agriculture in your point of view. | BT-2 | Understanding |
| 4. | How electrical power is an important power source in Indian agriculture?                      | BT-6 | Creating      |
| 5. | Discuss about connecting rod and its working Principle.                                       | BT-2 | Understanding |

## UNIT-II: ENGINESYSTEMS

Valves- inlet and outlet valves - Valve timing diagram - Air cleaner - Exhaust –Silencer - Cooling systems  
- Lubricating systems - Fuel system - Governor- Electrical system.

### PART-A

| Q.No. | Questions   | BT Level | Competence    |
|-------|---|----------|---------------|
| 1.    | What are the engineering materials used for inlet and exhaust valve?  | BT-6     | Creating      |
| 2.    | Give different valve operating mechanisms.  | BT-2     | Understanding |
| 3.    | Illustrate the purpose of valve timing diagram.   | BT-3     | Applying      |
| 4.    | What is the role of a pre-cleaner?  | BT-2     | Understanding |
| 5.    | List the uses of dusters.   | BT-1     | Remembering   |
| 6.    | Classify the types of dusters.  | BT-3     | Applying      |
| 7.    | How does a muffler work?  | BT-2     | Understanding |
| 8.    | Write any two reasons for engine knocking.  | BT-2     | Understanding |
| 9.    | Define the term air fuel ratio. How it is important?  | BT-1     | Remembering   |
| 10.   | Define knocking.  | BT-1     | Remembering   |
| 11.   | Conclude the causes of detonation.  | BT-5     | Evaluating    |
| 12.   | What is meant by scavenging?  | BT-2     | Understanding |
| 13.   | Identify different types of Governor.   | BT-1     | Remembering   |
| 14.   | When an engine cooling system needed to be operated in colder regions which cooling system will be good? Justify. | BT-6     | Creating      |
| 15.   | What is the importance's of cooling system?   | BT-2     | Understanding |
| 16.   | What are the disadvantages of overheating in engine?  | BT-2     | Understanding |
| 17.   | What are the disadvantages of overcooling in engine?  | BT-2     | Understanding |
| 18.   | What are the types of lubrication system?   | BT-1     | Remembering   |
| 19.   | Give the ideal properties of fuel used in tractor engine.   | BT-2     | Understanding |
| 20.   | What are the types of fuel injection system?  | BT-1     | Remembering   |
| 21.   | Define Governor.  | BT-1     | Remembering   |
| 22.   | What are the types of cooling system?   | BT-1     | Remembering   |
| 23.   | Explain the application of the electrical system in automobile.   | BT-1     | Remembering   |
| 24.   | What are the electrical system present in the Automobile?   | BT-2     | Understanding |

**PART-B**

| <b>Q.No</b> | <b>Questions</b>   | <b>BT Level</b> | <b>Competence</b> |
|-------------|--|-----------------|-------------------|
| 1.          | What are the various types of valve? Briefly explain about the working of poppet valve.    | BT-4            | Understanding     |
| 2.          | Explain about various valve operating mechanisms with neat sketches.                       | BT-4            | Analyzing         |
| 3.          | Briefly explain about the valve timing diagram for a four stroke SI engine.                | BT-3            | Applying          |
| 4.          | Discuss about the valve timing diagram for a four stroke CI engine.                        | BT-2            | Understanding     |
| 5.          | Explain various components used in exhaust system.   | BT-4            | Analyzing         |
| 6.          | a. What are the properties of efficient cooling system? (6)                                | BT-2            | Understanding     |
|             | b. What are the difference between air and water cooling system? (7)                       |                 |                   |
| 7.          | Explain various types of water cooling system with neat diagrams.                          | BT-4            | Analyzing         |
| 8.          | Explain about various parts of radiator with neat sketch.                                  | BT-4            | Analyzing         |
| 9.          | a. Point out the purposes of lubrication. (6)  | BT-4            | Analyzing         |
|             | b. Explain the types of lubricants. (7)  |                 |                   |
| 10.         | With suitable sketch explain pressurized lubricating system of a tractor with neat sketch. | BT-3            | Applying          |
| 11.         | Explain about fuel injection pump with neat sketch   | BT-4            | Analyzing         |
| 12.         | Briefly explain about battery and coil ignition system with neat sketch.                   | BT-3            | Applying          |
| 13.         | Discuss about the governor using a sketch.   | BT-2            | Understanding     |
| 14.         | Explain about the components of charging system.   | BT-4            | Analyzing         |
| 15.         | Define air cleaning system and explain types of air cleaning system used in farm tractors. | BT-4            | Analyzing         |
| 16.         | Explain types of variable valve timing and its advantages and disadvantages.               | BT-4            | Analyzing         |
| 17.         | Briefly explain about the pollution control method in exhaust emission.                    | BT-3            | Applying          |

**PART-C**

|    |  |      |               |
|----|--|------|---------------|
| 1. | Discuss the fuel system employed in the engine which is used in farm tractors.   | BT-2 | Understanding |
| 2. | Explain the constructional details of starting system.   | BT-4 | Analyzing     |
| 3. | What is the function of a governor in tractor? Classify the governing systems. With a neat sketch explain the working of a centrifugal governor. | BT-2 | Understanding |
| 4. | Briefly explain about the starting system used in farm tractor engine.   | BT-3 | Applying      |
| 5. | Write the difference between the air cooling and water cooling system.   | BT-2 | Understanding |

### UNIT III: TRANSMISSION SYSTEMS

Transmission - Clutch - Gear box - Sliding mesh - Constant mesh - Synchro mesh - Differential, final drive and wheels steering geometry - Steering systems - Front axle and wheel alignment - Brake - Types - System.

#### PART A

| Q.No. | Questions  | BT Level | Competence    |
|-------|--|----------|---------------|
| 1.    | What are the functions of transmission system in a tractor engine?     | BT-2     | Understanding |
| 2.    | What are the various components in transmission system?                | BT-2     | Understanding |
| 3.    | Examine the importance of clutch in power tiller.                      | BT-3     | Applying      |
| 4.    | What are the purpose of clutch?  | BT-2     | Understanding |
| 5.    | What are the types of clutch?  | BT-1     | Remembering   |
| 6.    | List out the basic functions of a gearbox.                             | BT-1     | Remembering   |
| 7.    | What are the importance's of sliding mesh gear box?                    | BT-1     | Remembering   |
| 8.    | What is the primary function of constant mesh gear box?                | BT-2     | Understanding |
| 9.    | Point out the importance of synchro mesh gear box.                     | BT-4     | Analyzing     |
| 10.   | What is the common ply rating of tyres used in agriculture operations? | BT-6     | Creating      |
| 11.   | What is PTO? Mention its applications.                                 | BT-4     | Analyzing     |
| 12.   | Write a note on tread and retreading of a tyre.                        | BT-1     | Remembering   |
| 13.   | What are the different types of Brake system used in tractor?          | BT-2     | Understanding |
| 14.   | Show the functions of brake lining.                                    | BT-3     | Applying      |
| 15.   | What are the importance's of a braking system?                         | BT-2     | Understanding |
| 16.   | Criticize the causes of poor brakes.                                   | BT-5     | Evaluating    |
| 17.   | What are the functions of brake shoe?                                  | BT-1     | Remembering   |
| 18.   | Give the advantages of disc brake.                                     | BT-2     | Understanding |
| 19.   | What is the purpose of steering linkage?                               | BT-1     | Remembering   |
| 20.   | What is known as power steering?                                       | BT-2     | Understanding |
| 21.   | Define differential in automobile.                                     | BT-1     | Remembering   |
| 22.   | What are the various components in differential?                       | BT-2     | Understanding |
| 23.   | What are the advantages of differential in vehicle?                    | BT-2     | Understanding |
| 24.   | Define front axle in automobile?                                       | BT-1     | Remembering   |



**PART-B**

| <b>Q.No</b> | <b>Questions</b>  | <b>BT Level</b> | <b>Competence</b> |
|-------------|---|-----------------|-------------------|
| 1.          | Explain the principle of operation of a clutch and discuss the single plate and multi plate clutch systems in detail.   | BT-4            | Analyzing         |
| 2.          | a. What are the requirements of the clutch? (6)   | BT-3            | Applying          |
|             | b. Explain about centrifugal clutch. (7)  |                 |                   |
| 3.          | A single plate friction clutch with both sides effective is to transmit 15 kW at 2,000 rev/min. The axial pressure is limited to 0.1 N/mm <sup>2</sup> . If the outer diameter, of the friction lining is 1.5 times the inner diameter. Find the required outer and inner diameters of the friction lining. Assumes uniform wear conditions. The coefficient of friction may be taken as 0.3. | BT-4            | Analyzing         |
| 4.          | List the all types of gears in tractor and explain any two types with neat sketch.  | BT-1            | Remembering       |
| 5.          | Write short notes on the principle of gearing. How is the final gear reduction in tractor arrived?  | BT-4            | Analyzing         |
| 6.          | Discuss how a steering system in a tractor works with a help of diagram.  | BT-2            | Understanding     |
| 7.          | Explain the steering mechanism of tractor.  | BT-4            | Analyzing         |
| 8.          | Illustrate the working of differential with neat sketches.  | BT-3            | Applying          |
| 9.          | Explain briefly the different types of differential used in tractor.  | BT-2            | Understanding     |
| 10.         | a. Discuss the need of gearbox. (6)   | BT-2            | Understanding     |
|             | b. Express about sliding mesh gearbox. (7)  |                 |                   |
| 11.         | a. Brief about constant mesh gear box. (6)  | BT-3            | Applying          |
|             | b. Explain in detail about synchromesh gearbox. (7)   |                 |                   |
| 12.         | Describe the construction and operation of power steering with neat sketch.   | BT-1            | Remembering       |
| 13.         | Discuss the working principle of brake system in tractor with sketch.   | BT-2            | Understanding     |
| 14.         | Explain in detail the different types of brakes with neat diagram.  | BT-4            | Analyzing         |
| 15.         | Explain the functions of front axle in farm tractors.   | BT-4            | Analyzing         |
| 16.         | Explain the construction and components of front axle in farm tractors.   | BT-4            | Analyzing         |
| 17.         | Explain the types of front axle with neat sketch.   | BT-2            | Understanding     |

**PART-C**

|    |   |      |               |
|----|---|------|---------------|
| 1. | Explain the common troubles encountered in gear boxes and suggest suitable remedies.  | BT-6 | Creating      |
| 2. | A sliding mesh type of gear box with forward speeds only is to be designed. The gear box should have the following gear ratios available approximately: 1.0, 1.5, 2.5 and 3.9. the center distance between the lay shaft and the main shaft is 78 mm and the smallest gear is to have at least 16 teeth with a diametric pitch of 3.25 mm. calculate the number of teeth of the various gears and the exact gear ratios thus available. | BT-4 | Analyzing     |
| 3. | Make a detailed comparison of various types of transmission systems used in farm tractors   | BT-4 | Analyzing     |
| 4. | Discuss the principle of operation, components, functions and advantages of a combine harvester.  | BT-2 | Understanding |
| 5. | Discus the comparison between the drum brake and disc brake.  | BT-2 | Understanding |

## UNIT IV: HYDRAULIC SYSTEMS

Hydraulic system - Working principles, three-point linkage - draft control - Weight transfer, theory of traction - Tractive efficiency - Tractor chassis mechanics - Stability - Longitudinal and lateral Controls - Visibility - Operators seat.

### PART A

| Q.No. | Questions   | BT Level | Competence    |
|-------|---|----------|---------------|
| 1.    | What are the four primary functions of hydraulic system in farm tractors?   | BT-2     | Understanding |
| 2.    | List the basic components of hydraulic system.  | BT-1     | Remembering   |
| 3.    | Classify pump.  | BT-3     | Applying      |
| 4.    | Give few properties of hydraulic fluid should possess.  | BT-1     | Remembering   |
| 5.    | Why must a hydraulic fluid have good lubricating ability?   | BT-6     | Creating      |
| 6.    | What type of fluid is more generally used to transmit power in hydraulic system?  | BT-2     | Understanding |
| 7.    | What is positive displacement pump?   | BT-2     | Understanding |
| 8.    | In what ways does positive displacement pump differ from a centrifugal pump?  | BT-6     | Creating      |
| 9.    | What is the use of three point linkage?   | BT-1     | Remembering   |
| 10.   | What are the functions of an accumulator?   | BT-1     | Remembering   |
| 11.   | Define tractive efficiency.   | BT-1     | Remembering   |
| 12.   | What is the condition for front wheel to leave the ground as per traction theory?   | BT-4     | Analyzing     |
| 13.   | A 3 x 30 cm plough is moving at a speed of 4 km/h. Calculate how much time it take to plough 500 x 500 m field when the field efficiency is 70 %? | BT-4     | Analyzing     |
| 14.   | How is the effective field capacity of a farm machine calculated?   | BT-6     | Creating      |
| 15.   | What is meant by vehicle stability?   | BT-1     | Remembering   |
| 16.   | Define position control   | BT-1     | Remembering   |
| 17.   | Why traction control is important in field farming?   | BT-6     | Creating      |
| 18.   | Give the functions of an intensifier.   | BT-2     | Understanding |
| 19.   | How will you evaluate the visibility factors for agricultural tractor operators?  | BT-5     | Evaluating    |

|     |   |      |               |
|-----|---|------|---------------|
| 20. | Give various application circuits using hydraulic systems.            | BT-2 | Understanding |
| 21. | Classify flow control valve.  | BT-1 | Remembering   |
| 22. | Draw the neat sketch about 2 way and 3 way directional control valve. | BT-1 | Remembering   |
| 23. | List the properties of fluid used in the hydraulic systems.           | BT-1 | Remembering   |
| 24. | Types of cylinders used in basic hydraulic systems.                   | BT-2 | Understanding |

**PART – B**

| Q.No | Questions  | BT Level | Competence    |
|------|--|----------|---------------|
| 1.   | Explain the working of hydraulic system in a tractor with a neat sketch.   | BT-4     | Analyzing     |
| 2.   | Express about the working of various components of hydraulic system in a tractor with a neat diagram.  | BT-2     | Understanding |
| 3.   | Explain various types of hydraulic system with neat sketches.  | BT-4     | Analyzing     |
| 4.   | Discuss about three point linkage using neat diagram.  | BT-2     | Understanding |
| 5.   | Brief about hydraulic steering system with suitable sketch.  | BT-4     | Analyzing     |
| 6.   | a. Explain the following<br>Position control (7)   | BT-4     | Analyzing     |
|      | b. Draft control (6)   |          |               |
| 7.   | Explain about hydraulic brakes with suitable diagram.  | BT-4     | Analyzing     |
| 8    | Total draft of four bottom, 35 cm MB plough when ploughing 18 cm deep at 5 kmph speed is 1600 kg. (i) Calculate the unit draft in kg/cm <sup>2</sup> (ii) What is actual power requirement? (iii) If the field efficiency is 75% what is the rate of doing work in ha/h. | BT-4     | Analyzing     |
| 9.   | Discuss the trouble shooting in tractor components their causes and remedies under hydraulic system disc functioning.  | BT-2     | Understanding |
| 10.  | What are the components in hydraulic system of a bulldozer?<br>Explain it with neat sketch.  | BT-3     | Applying      |
| 11.  | What do you mean by draft? Write formula for calculation of draft.<br>What are the factors affecting the draft?  | BT-2     | Understanding |
| 12.  | Explain about maintenance and repair of hydraulic system.  | BT-4     | Analyzing     |

|     |  |  |      |               |
|-----|--|--|------|---------------|
| 13. |  | Discuss about tractive efficiency with suitable parameters.                              | BT-2 | Understanding |
| 14. |  | Explain about operator seating arrangement with neat sketch.                             | BT-4 | Analyzing     |
| 15. |  | List and explain about the trouble shooting for the pump in the hydraulic systems        | BT-4 | Analyzing     |
| 16. |  | List and explain possible problem causes and remedy for pump in the hydraulic system     | BT-2 | Understanding |
| 17. |  | List and explain possible problem causes and remedy for cylinder in the hydraulic system | BT-4 | Analyzing     |

**PART-C**

|    |   |      |               |
|----|---|------|---------------|
| 1. | <p>A four-wheel tractor is plowing up a hill of <math>15^\circ</math> slope with three bottom 35 cm mould board plow at a speed of 4 km/hr. The tractor weighting 1590 kg has a wheel base of 240 cm and wheel trade of 115 cm. The C.G. is located 90 ahead of rear axle and 75 cm above the ground. The drawbar height is 40 cm. The line of pull of the implement makes an angle of <math>25^\circ</math> with the ground and is at a distance of 50 cm from the rear wheel contact point. Neglect rolling resistance. Assume: Cohesion coefficient = 0.15, Contact area = 1650 <math>\text{cm}^2</math>, Angle of internal friction = <math>30^\circ</math>. Find:</p> <p>(i) Reaction at the wheel (5)</p> <p>(ii) Pull (5)</p> <p>(iii) Tractive force. (5)</p> | BT-4 | Analyzing     |
| 2. | Discuss about the Mechanics of the tractor chassis with proper sketches.  | BT-2 | Understanding |
| 3. | Explain about the following hydraulic circuit.  | BT-6 | Creating      |
| 4. | How will you evaluate traction parameters? Give one suitable example.   | BT-5 | Evaluating    |
| 5. | Explain the Fault finding procedure by using troubleshooting charts.  | BT-5 | Evaluating    |

## UNIT V: POWER TILLER, BULLDOZER AND TRACTOR TESTING

Power tiller - Special features - Clutch - Gear box - Steering and brake - Makes of tractors, power tillers and bulldozers. Bulldozer - Salient features - Turning mechanism, track mechanism, components - Operations performed by bulldozers - Types of tests - Test procedure - Need for testing & evaluation of farm tractor - Test code for performance testing of tractors and power tillers.

### PART A

| Q.No. | Questions   | BT Level | Competence    |
|-------|---|----------|---------------|
| 1.    | Differentiate tracts and tyres in a bull dozer.                                     | BT-2     | Understanding |
| 2.    | What are the mobile sources of farm power?  | BT-2     | Understanding |
| 3.    | How does a bulldozer work? List down its parts.                                     | BT-4     | Analyzing     |
| 4.    | Explain shortly the types of power tillers.   | BT-4     | Analyzing     |
| 5.    | What do you mean by conservation tillage?   | BT-2     | Understanding |
| 6.    | What are the different methods of threshing the food grains?                        | BT-1     | Remembering   |
| 7.    | Draw and mark the parts of any primary tillage equipment.                           | BT-4     | Analyzing     |
| 8.    | Power tiller is advantageous over Tractor. Justify when and how?                    | BT-6     | Creating      |
| 9.    | Name any two applications of Bulldozer in agriculture.                              | BT-1     | Remembering   |
| 10.   | What are the different types of threshers used in agriculture based on power usage? | BT-1     | Remembering   |
| 11.   | Write the two distinct features of power tiller.                                    | BT-2     | Understanding |
| 12.   | List the types of harrows.  | BT-1     | Remembering   |
| 13.   | Write the different types of tillage.   | BT-2     | Understanding |
| 14.   | Write the regular maintenance of tractor after 8 hours of work.                     | BT-2     | Understanding |
| 15.   | What is mulch tillage?  | BT-1     | Remembering   |
| 16.   | What is meant by zero tillage?  | BT-1     | Remembering   |
| 17.   | What are the components of power tiller?  | BT-3     | Applying      |
| 18.   | What are the major parts of combine harvesters?                                     | BT-2     | Understanding |
| 19.   | How the depreciation of machinery is calculated using Straight Line method?         | BT-4     | Analyzing     |
| 20.   | List any two equipment for seeding and planting.                                    | BT-1     | Remembering   |
| 21.   | Explain the types of power tillers.   | BT-2     | Understanding |
| 22.   | How Tractors are helpful in Agriculture?  | BT-1     | Remembering   |

|     |  |      |               |
|-----|--|------|---------------|
| 23. | What is the purpose of Power tillers in Agriculture? | BT-2 | Understanding |
| 24. | What is bulldozer?                                   | BT-2 | Understanding |

| <b><u>PART-B</u></b> |  |                 |                   |
|----------------------|--|-----------------|-------------------|
| <b>Q.No</b>          | <b>Questions</b>   | <b>BT Level</b> | <b>Competence</b> |
| 1.                   | A flywheel type of chaff cutter has 2 cutting blades and flywheel rotates at 600 rpm. The width and the height of the throat are 300 mm and 100 mm respectively. The density of the forage in the throat is 100 kg/m <sup>3</sup> . The desired theoretical length of cut of the chaff is 10 mm. What is the theoretical capacity of the chaff cutter? | BT-4            | Analyzing         |
| 2.                   | Briefly discuss the factors influencing the performance of a thresher.   | BT-2            | Understanding     |
| 3.                   | Discuss the special features of bull dozers and their merits.  | BT-2            | Understanding     |
| 4.                   | Compare and contrast Tractors and Power tillers in various dimensions.   | BT-4            | Analyzing         |
| 5.                   | Explain the disc plough, tilt angle and disc angle with neat sketches.   | BT-4            | Analyzing         |
| 6.                   | Discuss the various forces acting upon a tillage implement?  | BT-2            | Understanding     |
| 7.                   | Discuss the use of power tiller in agricultural operations.  | BT-2            | Understanding     |
| 8.                   | Write about clutch used in power tiller with neat sketch.  | BT-2            | Understanding     |
| 9.                   | Explain the operation principle and components of harvesting equipment.  | BT-4            | Analyzing         |
| 10.                  | Explain the working of a bull dozer with its basic parts.  | BT-4            | Analyzing         |
| 11.                  | What are the different types of bulldozer? Explain their working principle.  | BT-1            | Remembering       |
| 12.                  | Write in detail the special features of power tillers.   | BT-1            | Remembering       |
| 13.                  | Discuss the advantages of power tillers.   | BT-2            | Understanding     |
| 14.                  | a. Explain primary and secondary tillage. (7)  |                 |                   |



|     |    |  |      |               |
|-----|----|--|------|---------------|
|     | b. | List down the implements used for both the tillage and explain them briefly. (6) | BT-1 | Remembering   |
| 15. |    | What are the test carried out while selecting the tractor                        | BT-2 | Understanding |
| 16. |    | Explain the bulldozer parts and their functions.                                 | BT-4 | Analyzing     |
| 17. |    | Write briefly what are the operations performed by the bulldozer.                | BT-4 | Analyzing     |

**PART-C**

|               |    |   |      |               |
|---------------|----|---|------|---------------|
| <b>PART-C</b> |    |   |      |               |
| 1.            | a. | Discuss the principle of operation, components, functions and advantages of a combine harvester. (7)  | BT-2 | Understanding |
|               | b. | A bullock drawn desi plough working at 2.4 kmph cuts soil 10 cm deep and makes 20 cm wide furrow at the top. Calculate the volume of soil handled in 3 hours. (8) | BT-4 | Analyzing     |
| 2.            |    | Explain the importance of periodic maintenance of the tractor.  | BT-3 | Applying      |
| 3.            |    | Write about the common troubles of tractor engine and their remedies.   | BT-2 | Understanding |
| 4.            |    | Discuss in detail about the inter cultural implements and harvesting implements.  | BT-2 | Understanding |
| 5.            |    | Explain the salient features of bulldozer.  | BT-4 | Analyzing     |