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3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) What is meant by mechanical power in farm operations?

b) State the function of the steering system in a tractor.

c) Name two types of tractor braking systems used in tractors.

d) State the function of a transmission system in a tractor.

e) State the necessity of cooling system in tractors. Name types of cooling systems used in tractors.

f) State the function of a clutch in a tractor?

g) State two necessities of tractor controls.

Marks

2. Attempt any THREE of the following : **12**

a) Differentiate between SI engine and CI engine with at least four points.

b) Explain the role of each component in a 4 - stroke engine : piston, cylinder, camshaft, crankshaft and flywheel.

c) Explain the working cycle of a 4 - stroke C.I. engine with a simple diagram.

d) Describe the properties of a good fuel in tractors.

3. Attempt any THREE of the following : **12**

a) Explain the function of the following tractor system : braking and hydraulic with sketch

b) Explain the classification of tractors based on design with suitable examples

c) A farmer needs a tractor primarily for irrigation pump operation. Which type of tractor should you recommend based on power and utility? Justify your answer.

d) A tractor used for frequent braking in hilly areas starts showing brake failure. Suggest possible causes and solutions based on the braking system.

4. Attempt any THREE of the following : **12**

a) Explain the working of any one starting system used in tractors.

b) Explain the different types of tractor power outlets with examples.

c) A farmer needs to operate a threshing machine using his tractor. Which power outlet should he use and why? Explain with technical justification.

d) Describe the working principle of hydraulic brakes and compare in briefly with mechanical brakes.

e) A tractor operator is facing difficulty in maneuvering and controlling different functions during field operations. Which tractor controls would help improve the situation? Explain how.

Marks

5. Attempt any TWO of the following : **12**

a) Explain the importance of lubrication system in a tractor engine. State different types of lubrication systems used in tractors.

b) What are the types of lubricants used in tractors? Explain their properties.

c) Choose a suitable lubricant for a tractor engine used continuously in high-temperature environments. Justify your selection with relevant properties.

6. Attempt any TWO of the following : **12**

a) Describe the function and types of ignition systems in an tractor.

b) State the role of a differential unit in a tractor. Explain its necessity and working.

c) Explain how improper functioning of the differential unit can affect tractor movement during turning. How would you check and rectify it?

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