Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R3A06

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Third Semester

Agricultural Engineering

R21UAG306 FARM MACHINERY AND EQUIPMENT

(Regulations R2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. How much percent of farm holding belong to small and marginal farmers? CO1 -U

   (a) 75% (b) 25% (c) 64% (d) 36%

2. The methods of ploughing on which the plough works round the strip of ploughed land is _____ CO1 -U

   (a) Gathering (b) Headland (c) Casting (d) None of these

3. Which seed metering device mechanism in a planter brushes out excess seeds from the cells of the feed mechanism? CO1 -U

   (a) Edge drop (b) Cut off (c) Knock out (d) Flat drop

4. What is the field capacity of a potato planter (semi-automatic)? CO1 -U

   (a) 0.15-0.25 ha/hr (b) 0.10-0.14 ha/hr (c) 0.40-0.55 ha/hr (d) 0.09-0.14 ha/hr

5. Which sprayers are operated usually with Internal Combustion engines? CO1 -U

   (a) Power sprayer (b) Hydraulic sprayer (c) Commercial sprayer (d) Foot sprayer

6. Most of the hydraulic sprayers are equipped with _____ CO1 -U

   (a) Positive displacement pump (b) Reciprocating pump

   (c) Centrifugal pump (d) Rotary pump

7. In flail type mower, cutting section has CO1 -U

(a) Fixed knives (b) Swinging knives (c) Reciprocating knives (d) Rotating knives

8. A multi-crop thresher is used for threshing CO1 -U

(a) Wheat (b) Paddy (c) Soyabean (d) All are correct

9. _____ are the testing enters that have published standards on machine/components for different agricultural machines. CO1 -U

(a) ISO (b) BIS (c) NCAM (d) all the above.

10. How much weight is put on the seat of the driver to replace the driver to determine centre of gravity CO1 -U

(a) 100 kg (b) 75 kg (c) 25 kg (a) 55 kg

PART – B (5 x 2= 10Marks)

11. Define the field efficiency. CO1 -U

12. List out the different types of sowing methods CO1 -U

13. State the points of care and maintenance of sprayer. CO1 -U

14. How many hectares per day of 10 hours can be cut by a combine with 4 m cutter bar, when it is running at 4km/hr. CO4-App

15. Explain the quality system standard ISO 9000. CO1 -U

PART – C (5 x 16= 80Marks)

16. (a) A farmer purchased a tractor of 25kW power at a total cost of Rs. 3,00,000/- and a three-bottom plough of 30 cm bottom width at Rs. 12000/- only. The fuel consumption of the tractor was 6 liters/hr. at the ploughing speed of 5 km/hr. CO2 -App (16)

i) Calculate the area ploughed per hour

ii) Determine the cost of ploughing per hectare. Make necessary assumptions if any.

Or

(b) (i) Total Draft of 4 bottom 40cm MB plough when ploughing 17.5cm deep at 5.5km/hr speed is 1700kg and field efficiency is 75% calculate: i)Unit draft ii)actual power required iii) area covered/hr CO2 -App (8)

(ii) Calculate the seed rate/hectare of 7x17 cm seed drill, whose main drive wheel is 124cm diameter and total weight of grain collected in 20 revolutions is 0.423kg. CO2 -App (8)

17. (a) Explain seed drill and seed cum fertilizer drill and describe the process of calibration of seed and seed cum fertilizer drill? CO1 -U (16)

Or

	(b)	Explain the working of a) Fluted feed type b) Internal double run type c) Cup feed mechanism with neat sketch	CO1 -U	(16)
18.	(a)	How would you effectively use a knapsack motorized mist blower cum duster and a power sprayer to manage pest control and fertilization? Include a neat sketch to illustrate the application of each tool in different parts of the farm.	CO2 -App	(16)
		Or		
	(b)	With the help of a neat sketch, briefly explain the working of a bucket-type and foot-pedal-type sprayer. Based on their working principles, suggest which type of sprayer would be more suitable for a specific crop or spraying task	CO2 -App	(16)
19.	(a)	Explain mower and discuss about classification of mower.	CO1-U	(16)
		Or		
	(b)	Discuss elaborately the combine harvester and thresher types its construction and working	CO1-U	(16)
20.	(a)	You are tasked with designing a tractor cab for use in extreme weather conditions. How would you address operator exposure to environmental factors such as heat, cold, dust, and noise? Outline the specific features and materials you would incorporate to protect the operator and ensure their comfort and safety.	CO2 -App	(16)
		Or		
	(b)	Describe the role of BIS (Bureau of Indian Standards) in the testing and quality assurance of tractors. How do BIS testing procedures ensure the quality and reliability of tractors in the market?	CO2 -App	(16)