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Question Paper Code: U3A06

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Third Semester

Agricultural Engineering

21UAG306– FARM TRACTOR

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The main heart of the tractor is CO1-U
(a) tyre (b) engine (c) steering system (d) all of the above
2. Which one of the following is not a fixed cost? CO1- U
(a) depreciation cost (b) fuel cost (c) Insurance (d) Tax
3. In two stroke engine there is one power stroke for every ____ CO1- U
revolutions of the cranks shaft
(a) carburator (b) governor (c) fuel (d) pre- ignition
4. In most automobiles, which lubrication system is commonly used? CO1- U
(a) Splash system (b) Pressure system (c) Petrol system (d) Gravity system
5. Which of the following is the coefficient of friction of the clutch plate? CO2- App
(a) 1.3 (b) 0.8 (c) 0.4 (d) 0.1
6. What is used to transfer power from gearbox to differential? CO1 -U
(a) Tie rod (b) Suspension (c) Pivot (d) Propeller shaft
7. The force developed in the hydraulic system is high due to CO1-U
(a) high pressure (b) more oil (c) less pressure (d) less oil
8. A tractor seat suspension should have its natural frequency in the range of CO2- App
(a) 0.5 to 2.0 Hz (b) 2.0 to 4.0 Hz (c) 4.0 to 6.0 Hz (d) 6.0 to 8.0 Hz

9. How much weight is put on the seat of the driver to replace the driver to determine centre of gravity CO2- App
- (a) 100 kg (b) 75 kg (c) 25 kg (d) 55 kg
10. At what angle the tractor should be tilted on either side while the air cleaner oil pull-over test? CO2- App
- (a) 20° (b) 45° (c) 30° (d) 15°

PART – B (5 x 2= 10 Marks)

11. Classify the tractor based on the type of drive. CO1- U
12. How to calculate depreciation cost in tractor? CO2-App
13. Specify the purpose of drawing the valve timing diagram. CO1-App
14. List the different types of valve. CO1- U
15. State the purpose of testing of tractors. CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Explain in detail about the power tiller and its components. CO1-U (16)
- Or
- (b) Explain in detail about the fixed and operating cost. CO1-U (16)
17. (a) Evaluate a total cost of a 30 horse power diesel power tiller with a list price of Rs 1, 80,000. An economic life of 10 years is assumed, and the tiller is expected to be used 500 hours per year. Hiring charges per hour is 400 CO2-App (16)
- Assumption
- ✓ Salvage value (SV) : 11%
 - ✓ Interest rate : 11 %
 - ✓ Insurance & taxes : 1.5% of PP
 - ✓ Housing : 1 % of PP
 - ✓ Fuel consumption : 1lit/hour
 - ✓ Fuel Cost : Rs 95 per lit
 - ✓ Lubrication cost : Rs250 per lit
 - ✓ Lubrication consumption : 5% of fuel
 - ✓ Repair and Maintenance : 5-8 %
 - ✓ Labour cost :Rs 100 per hour
- Or
- (b) Appraise and contrast the working principle of air cooled and water cooled engine. CO2-App (16)

18. (a) Draw a neat sketch of differential and its operation. CO2-App (16)
Or
(b) With a neat sketch discuss the construction and working principle of sliding mesh gear box. CO2-App (16)
19. (a) Explain in detail about the basic components of hydraulic system. CO1-U (16)
Or
(b) Explain the three point linkage with neat sketches. CO1-U (16)
20. (a) Discuss about the Optimization of tractor field efficiency to save energy/fuel CO1-U (16)
Or
(b) Explain the test codes for performance testing of tractors CO1-U (16)

