

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations February-2024

TRACTOR DESIGN AND TESTING

(Agricultural Engineering)

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- | | | | | |
|---|--|-----|----|----|
| 1 | a Explain about classification of tractors. | CO1 | L1 | 6M |
| | b Write about global variations in tractor design. | CO1 | L2 | 6M |

OR

- | | | | | |
|---|---|-----|----|------|
| 2 | Write about hierarchical development in tractor design. | CO1 | L1 | 12 M |
|---|---|-----|----|------|

UNIT-II

- | | | | | |
|---|--|-----|----|----|
| 3 | a Determine the maximum, minimum and average pressure in plate clutch when the axial force is 4 kN. The inside radius of the contact surface is 50 mm and the outside radius is 100 mm. Assume uniform wear. | CO2 | L3 | 6M |
| | b single plate clutch, with both sides effective, has outer and inner diameters 300 mm and 200 mm respectively. The maximum intensity of pressure at any point in the contact surface is not to exceed 0.1 N/mm ² . If the coefficient of friction is 0.3, determine the power transmitted by a clutch at a speed 2500 r.p.m. | CO2 | L3 | 6M |

OR

- | | | | | |
|---|---|-----|----|-----|
| 4 | Explain about the different tractor transmission types. | CO2 | L2 | 12M |
|---|---|-----|----|-----|

UNIT-III

- | | | | | |
|---|---|-----|----|----|
| 5 | a Explain about the steering system of tractor. | CO3 | L2 | 6M |
| | b Write about good steering qualities of tractor. | CO3 | L1 | 6M |

OR

- | | | | | |
|---|--|-----|----|-----|
| 6 | Explain about mechanical steering system of tractor with components. | CO3 | L2 | 12M |
|---|--|-----|----|-----|

UNIT-IV

- | | | | | |
|---|---|-----|----|----|
| 7 | a A four-stroke cycle diesel engine of a tractor is developing a mean effective pressure of 10 bars. It develops a power of 25 kW while running at a speed of 2200 rpm. Take stroke bore ratio as 1.2; calculate the bore and stroke of engine. | CO4 | L3 | 6M |
| | b A four-stroke cycle diesel engine has stroke bore ratio of 1.25. The mean effective pressure recorded was 0.8 MPa. The engine is producing indicated power of 23.5 kW while running at 2000 rpm. Determine the dimensions of engine. | CO4 | L3 | 6M |

OR

- | | | | | |
|---|---|-----|----|-----|
| 8 | Explain about the cylinder and cylinder head in tractor engine. | CO4 | L2 | 12M |
|---|---|-----|----|-----|

UNIT-V

- | | | | | |
|---|--|-----|----|----|
| 9 | a The indicated horse power of a SI engine is 30 hp and brake horse power of the engine is 20 hp. Calculate the frictional horse power | CO5 | L3 | 6M |
| | b Calculate the brake power of a 2-cylinder 4 stroke cycle IC engine 12×15 cm. The mean effective pressure is 700 kPa and speed of crankshaft is 1200 rpm. The mechanical efficiency is 75%. | CO5 | L3 | 6M |

OR

- | | | | | |
|----|--|-----|----|-----|
| 10 | Define testing and evaluation. Explain about the procedure of testing. | CO5 | L1 | 12M |
|----|--|-----|----|-----|

*** END ***

