

(Following Paper ID and Roll No. to be filled in your Answer Books)

PAPER ID :

Roll No.

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B.TECH.

Theory Examination (Semester-VIII) 2015-16

TRACTOR DESIGN PRINCIPLE

Time : 3 Hours

Max. Marks : 100

SECTION-A

1. Attempt all parts:

(10×2=20)

- What is gear train?
- Write the function of clutch.
- Write the name of at least five tractor manufacturing companies.
- What is the function of steering system?
- What factors should be needed in farm machinery/tractor design from human point of view?
- Define tractive efficiency.
- What do you mean by rolling resistance and coefficient of traction?
- What is difference between power steering and mechanical steering?
- What is gross tractive efficiency?
- Define ergonomics.

SECTION-B

(10×5=50)

2. Attempt any five parts of the following:

- Discuss design consideration of seat and control of tractor system.
- What is the traction? Which of the material improve traction and explain Mohar Coulomb Failure criteria?
- What is meant by automatic hydraulic control in tractor?
- What do you mean by operator-machine interface?
- Explain steering system in tractor with different component also explain Akerrman steering system.
- What is the lateral stability discuss different parameter require for the lateral stability of tractor and also so with neat sketch diagram.
- What do you mean by vibration in tractor?
- What is the optimum vision of tractor operator?

SECTION-C

(15×2=30)

Attempt any two questions of the following:

- Attempt the following
 - A traction wheel having 600 mm diameter was tested in soil bin and following data were recorded as Angular speed of wheel = 10 rpm, Input torque of wheel Axel = 60 Nm, Drawbar pull = 150 N, Normal load on wheel axel = 500 N, Wheel forward speed = 0.25 m/sec. Calculate Co-efficient of traction, wheel slippage and tractive efficiency.
 - Discuss performance of tractor engine with all parameter and graph.
- Attempt the following
 - What is the relation between torque-slip for the wheel on soil. Also explain the condition of Towed wheel and Driving wheel.
 - Explain the mechanism of tractor chassis and find out the draw bar pull when tractor becomes unstable.
- Attempt the following
 - Discuss design consideration of hitching system for mounted type implements.
 - Define human factor engineering. How it help to designing of a tractor?