Printed Pages : 4

EAG038

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

PAPER ID : 180858

Roll No.

B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15

TRACTOR DESIGN PRINCIPLES

Time : **3** Hours]   [Total Marks : **100**

Note :   Attempt each question. Assume data wherever necessary. The use of calculator is permitted.

SECTION - A

1   Answer the following short answer type   10×2=20
        questions :

(a)   For what purpose air cleaner is used ? Mention its advantages.

(b)   Briefly show the actions performed by a combine.

(c)   What do you mean by specific fuel consumption of a tractor?

(d)   What do you mean by hitching? What are the types of hitching ?

(e)   What is the function of Thermostat valve?

(f)   What do you mean by agricultural tractor? Name any six tractors commonly used in India?

(g) Define primary tillage. Mention the objectives of primary tillage.

(h) Give main specifications of any five tractors manufactured in India.

(i) What is the,difference between I.H.P. and B.H.P.?

(j) How performance of a Rasp-bar cylinder of wheat thresher depends?

SECTION-B

2 Attempt any three questions : 10×3=30

(a) A Massey Ferguson 1035 diesel tractor has a three cylinder, four stroke engine (one power stroke for two revolutions)with cylinder bore = 88.9 mm, stroke = 127 mm, compression ratio 16.5 : 1, belt horse power = 32 and engine speed = 2000 rpm, calculate :
  (i) Piston displacement.
  (ii) Displacement volume
  (iii) Piston speed
  (iv) Stroke-bore ratio.

(b) What are the functions of a connecting rod? What are their components ? Design the big end section of a connecting rod for 25 HP Tractor.

(c) What are the modern features of an ideal air cleaner? How will you estimate the quantity of air intake by the engine?

(d) What are the forces acting on tillage implements? Explain with the help of a figure. Also discuss the implements of tillage?

(e) Explain the historical development of agricultural tractors in India.

SECTION - C

3 Attempt all parts of the following :   **10×5=50**

(a) What are the important test conditions of a tractor? How belt performance test differ from drawbar performance test?

OR

Explain the principle of Hydraulic control system with the help of a diagram.

(b) For what purposes the radiator in a vehicle is used. Mention the important parameters of designing of a radiator depends?

OR

A gear pump operating at a speed of 2200 rpm developing a pressure Of 10 MPa requires input power of 10.70 KW. Its torque efficiency taken as 70%. Calculate the oil flow rate of pump in lit/min and its displacement volume/ revolution. Also calculate theoretical disadvantages of pump if its volumetric efficiency is 80%.

(c) What are disc angle and tilt angle ? Design a disc plough for 35 H.P. Tractor. Assume the necessary data.

OR

Explain the design of mechanical power transmission of agricultural tractors.

(d) Design cylinder head and stud for liner for a vertical four stroke diesel engine which has following specifications:

(i) BHP =10

(ii) RPM =1000

(iii) IMEA=3.5 kg/cm^2

(iv) Mech. Efficiency: 0.8

OR

Design a cast iron piston for a four cylinder tractor engine with following specifications:

(i) Cylinder bore = 100 mm

(ii) Stroke = 120 mm

(iii) Speed = 2200 rpm.

(iv) Max. gear pressure = 50 Kg / cm^2

(v) EMEP = 6.5 Kg/cm^2

(vi) Fuel consumption = 0.17 kg/bhp/hr.

(e) Give a procedure foe balanced design for stability of a tractors.

OR

How will you calculate /hour cost of operation of a 35 H.P. Tractor ?

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