

Printed Pages : 4



EAG-501

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

PAPER ID : 180508

Roll No.

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B. Tech.

(SEM. V) (ODD SEM.) THEORY
EXAMINATION, 2014-15

**DESIGN OF
AGRICULTURAL TRACTORS AND MACHINERY**

Time : 3 Hours]

[Total Marks : 100

Note : The question paper is divided into three sections.
Attempt each section.

SECTION-A

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

- (a) For which purposes the units straw walker and header are used?
- (b) What is the main advantage of load sensing system?
- (c) List the operations performed by self propelled combine harvester.
- (d) Name any two machine parts made from cast iron and soft centre steel.

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[Contd...

- (e) On what factor the performance of rasp bar cylinder with open gate depends upon.?
- (f) From which material the seed rollers of seed cum ferti -drill is made up of.?
- (g) Which material is used for piston rings? Show the heat treatment used for it.?
- (h) Name any two most important functions of cooling system.
- (i) Give any two applications of friction clutches.
- (j) Why ground wheel is provided in manually operated seed-cum ferti seed drill?.

SECTION - B

2 Attempt any three parts of the following : $10 \times 3 = 30$

- (a) Describe the step-by-step procedure of cylinder designing.
- (b) Design a seed cum fertilizer drill for 35 H.P. Tractor. Assume necessary data.
- (c) Explain the forces acting on the tillage implements with the help of a neat diagram.
- (d) What are the essential parts and their working of a combine harvester? What design should be kept in mind to minimize grain losses?
- (e) How will you classify hydraulic cylinders? With the help of neat sketch explain the design of single acting type hydraulic cylinder.

SECTION - C

3 Attempt any five questions : **10×5=50**

- (a) Describe the design considerations of vertical conveyor reaper? What are the total forces acting on a standard reciprocating knife cutter bar of a bullock operated VCR. The bullocks are operating at a speed of 3.6 km/hr. Assume any other data required.
- (b) Design a tractor drawn disc plough for 40 H.P. tractor to be operated in medium soil conditions up to a depth of 17.5 cm. Assume the required data.
- (c) Explain the mechanics of hitching of primary tillage machineries from a tractor?
- (d) A two stroke four cylinder engine having bore diameter of 250mm and stroke length 500 mm is working at 150 rpm. The mean effective pressure is 7 kg/cm². The mechanical efficiency is 86%. Calculate IHP, BHP and stroke bore ratio.
- (e) Explain the basic components of fluid power transmission and Automatic draft control system of a tractor.
- (f) Define “Traction”. What are the factors affecting traction? Explain in detail.

- (g) Write short notes on:
- (i) Design of threshing machines..
 - (ii) Annealing and case hardening.
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