KERALA AGRICULTURAL UNIVERSITY

B.Tech (Agrl.Engg) Degree Programme 2013 Admission
VIth Semester-Final Examination- July-2016

Cat. No: Fpme.3216

Title:Tractor Systems and Controls (2+1)

Marks: 50

Time : 2 hours

I. Fill up the blanks
(10 x 1=10)

1. In three-point hitch system, the number of compression links are_____.

2. Thermal efficiency of petrol engines varies from _____ to _____ %.

3. RPM of PTO shaft is measured by _____ instrument.

4. Engine rpm of tractor is automatically controlled by _____.

5. Common firing order of four cylinder engine is _____.

6. The transmission system in tractor is fitted with _____ gears.

7. Dead weight is added on _____ of tractor to compensate for weight transfer.

8. Brake specific fuel consumption of 35 hp tractor is about _____ g/PTO hp/hr

9. Worm gear is used in _____ system of tractor.

10. Useful life of tractor is generally taken as _____ years or _____ hours.

II Answer the following any FIVE
(5 x 2=10)

1. Differentiate BHP and IHP.

2. Function of differential system.

3. Compare between oil immersed brake and dry brake for agricultural operation .

4. Draw a flow diagram for power transmission in power tiller.

5. Three point linkage for hitching implements.

6. Working of engine governor.

7. Describe daily maintenance routine of tractor .

III. Write short notes on ANY FIVE of the following
(5 x 4=20)

1. Differentiate between diesel and petrol engine .

2. Working principle of clutch with diagram.

3. Working principle of constant mesh type gear box.

4. Ackerman steering system used in tractor.

5. Describe working principle of planetary gear reduction unit in tractor.

6. Discuss different power and safety tests of tractor.

7. Explain the working of external hydraulic cylinder of tractor trailer by a hydraulic circuit diagram.

IV. Write essay on ANY ONE of the following   (1 x 10=10)

1. a) Explain position control and draft control by hydraulic system with neat diagrams.

    b) Calculate the torque required to drive a hydraulic pump at 2000 rpm, if change in pressure across the pump is 240 bar. Assume, flow of oil is 0.125 1/minute

2. a) Discuss different braking systems used in tractor

    b) A tractor having a weight of 1500 kgf, is brought to a speed of 5 kmph in 5 seconds by applying uniform acceleration. Calculate force on tractor.