KERALA AGRICULTURAL UNIVERSITY
B.Sc (Hons.) Ag. Programme
IInd Semester Re- Examination- July/August -2015

Cat. No: Engg.1202   Marks: 80
Title: Farm power & Machinery (1+1)   Time: 3 hours

I. State True or False: (10 x 1= 10 marks)

1. The horse power of a tiller varies between 15 to 20
2. The air fuel ratio of carburetor in a spark ignition engine is usually in the range of 15:1 to 17:1
3. Governor unit is a special arrangement of gears to permit one of the rear wheels of the tractor to rotate slower or faster than the other
4. Rocker arm is a unit of the starting system
5. Clutch is a component of the power transmission system of the tractor
6. Cultivator is used for tilling the soil between standing rows of crops.
7. Jointer is the part of plough bottom to which the share, the mould board and the landside are attached tightly.
8. When the soils are loose and sticky, slat type mould boards are preferred.
9. Single action disc harrows are used to work close to the trunk of trees beneath overhanging branches.
10. A mower knife is said to be in good registration when the knife section stops in the centre of its guard on every stroke.

II. Write short notes/answers etc. on ANY TEN   (10 x 3 = 30 marks)

1. List the parts of a carburetor and differentiate between choke and spark plug
2. Differentiate between otto cycle and diesel cycle with PV diagrams
3. What are the differences between four stroke and two stroke cycle engines
4. Describe the combustion process in spark ignition engine and list the functions of the flywheel
5. What are the components of the fuel supply system of a diesel engine? Differentiate between flash point and pour point
6. What are the main components of a tractor? Explain the working of a power tiller
7. Distinguish between horizontal suction and vertical suction of a mould board plough.

8. Describe the adjustments of a disc plough.
9. List the different types of secondary tillage implements.
10. Briefly explain the working principle of a rocker sprayer with the help of a line sketch.
11. Distinguish between a seed drill and a planter.
12. Calculate the time required to harvest 2 ha of paddy by means of a 2m reaper operated at 4KMPH. The field efficiency of the reaper is 80%.

III. Write short essays/Answer on ANY SIX of the following   (6x 5 = 30 marks)

1. A Four cylinder four stroke diesel engine has a cylinder diameter of 20 cm, stroke-bore ratio is 1.45, clearance volume 4508 cm^3, engine speed 250 rpm, mean effective pressure 6.8 kg/cm^2 and mechanical efficiency is 75%. Calculate (i) IHP, (II) BHP (iii) Compression ratio and (iv) Swept volume.

2. Explain with the help of neat sketches the principle of operation of a four stroke cycle diesel engine.

3. Explain the different system of IC engines. Explain the connecting rod crank mechanism of a tractor.

4. What is the function of Governor in a tractor? Draw the valve timing diagram of a typical tractor engine.

5. Explain the functions of different components of a mould board plough.

6. List the different types of disc harrows. What are the adjustments of a disc harrow for obtaining higher penetration?

7. Briefly explain the different types of metering mechanisms in a seed drill.

8. Explain the different types of dusters and the care and maintenance of dusters.

IV. Write short essays/Answer on ANY ONE of the following   (1 x 10 = 10 marks)

1. Explain the different sources of farm power, its advantages and disadvantages. Discuss the scope of mechanization, constraints and suggestions for improving mechanization in Kerala.

2. a). Calculate the size of tractor to pull a 4 bottom 30 cm MB plough through a depth of 10cm. The soil offered a resistance of 0.5 kg/cm^2. Transmission and tractive efficiencies being 80% and 40% respectively.

b).Explain the functions of a seed drill with the help of a neat sketch.