**B.Tech Odd Semester (CBCS) Exam.,
December—2017**

AGRICULTURAL ENGINEERING

(3rd Semester)

Course No. : AECC–05

(Farm Machinery)

Full Marks : 50
Pass Marks : 15

Time : 2 hours

Note : 1. Attempt _any_ **five** questions.

2. Begin each answer in a new page.

3. Answer parts of a question at a place.

4. Assume reasonable data wherever required.

5. The figures in the margin indicate full marks for the questions.

1. _(a)_ What is tillage? Distinguish between primary tillage and secondary tillage. 3

_(b)_ Draw a neat diagram of any primary tillage implement. 3

_(c)_ Calculate the size of a tractor to pull a 4-bottom 35 cm MB plough through a depth of 8 cm. The soil resistance is 0.8 kg/cm^2. The speed of the tractor is 5.5 km/h, transmission and tractive efficiency of the tractor being 80% and 30% respectively. 4

2. _(a)_ Draw a neat diagram of any secondary tillage implement. 3

_(b)_ What is the difference between disc angle and tilt angle? 3

_(c)_ An indigenous plough has a 20 cm wide furrow at the top and 10 cm depth. Calculate the volume of soil handled per day 8 hours, if the speed of working is 2.5 km/h. 4

3. _(a)_ What are the functions of seed drill? Explain the working of a seed drill with neat sketch. 7

_(b)_ Two bullocks weighing 400 kg each, are pulling an implement with a speed of 3 km/h. Find the power to be developed by the bullocks. 3

(3)

4. *(a)* Explain the relationship between the following with examples with respect to spraying : 4

   (i) Droplet size and Number of droplets

   (ii) Droplet size and Surface area covered

   (iii) Droplet size and Pressure requirement

   (iv) Pressure on liquid chemical and Flow rate

   (b) Explain various types of nozzle used in a sprayer along with their specific applications. 6

5. *(a)* What is application rate? Determine the application rate of a sprayer, if the nozzle flow rate is 350 mL/minute. The row spacing of the crop is 60 cm and speed of operation is 3 km/h. 4

   (b) Explain the construction and working of a lever operated knapsack sprayer with a neat diagram. 6

6. Write short notes on the following : 5+5=10

   (a) Vertical conveyor reaper windrower

   (b) Thresher

(Turn Over)

(4)

7. Explain the construction and working of a combine harvester with neat sketch. 10

8. A tractor costing ₹ 6,50,000 is expected to have useful life of 10 years and trade-in value of 10 percent of the initial cost. Calculate the depreciated value after 6 years by different methods. 10

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