



**KERALA AGRICULTURAL UNIVERSITY**

**B. Sc. ( Hons.) C & B 2016 Admission**

**IV Semester Final Examination- July-2018**

**Farm power and equipment (1+1)**

**Engg.2201**

**Marks: 50**

**Time: 2 hours**

**(10x1=10)**

**I Fill in the blanks:**

- 1 The ratio of effective field capacity and theoretical field capacity is known as .....
- 2 The horizontal component of pull in the direction of travel is called .....
- 3 The capacity of a thresher is expressed in .....
- 4 While ploughing 1 ha of land by a 15 cm country plough, the farmer has to walk..... km
- 5 Walk behind tractors are commonly known as .....
- 6 The average horse power that can be generated by a farm worker is .....
- 7 Bukhari, Kothar and Morai are structures used for .....
- 8 The process of filling the casing and suction pipe of a centrifugal pump before starting is called .....
- 9 In disc plough the angle at which the plane of the cutting edge of the disc is inclined from the vertical is called .....
- 10 The size of a combine harvester / reaper is normally expressed by .....

**II Write Short notes on ANY FIVE of the following**

**(5x2=10)**

- 1 What is tillage? How is tillage implements classified?
- 2 What is vertical suction of mould board plough? What is its importance?
- 3 What is registration of cutter bar assembly? What is its importance?
- 4 What are border and check basin methods of irrigation?
- 5 Where is straw walker used? What are its functions?
- 6 How do centrifugal pumps work?
- 7 Define threshing and cleaning efficiencies of threshers.

**III Answer ANY FIVE of the following**

**(5x4=20)**

- 1 Explain any four types of seed metering mechanisms.
- 2 What is depreciation? Explain any three methods of calculating depreciation.
- 3 Neglecting wheel slippage, calculate the seed rate per hectare of a 7 x 20 cm seed drill whose main drive wheel diameter is 120 cm. The total weight of grain collected from all furrow openers in 20 revolutions was 0.415 kg. Also calculate the theoretical time required for covering one ha, if the operating speed is 4.2 kmph.
- 4 With a neat diagram, explain the main components of drip irrigation system.

**P T O**

- 5 What is silo? Explain different types of silos.
- 6 What is sprayer calibration? Explain the procedure for calibrating manually operated sprayers.
- 7 An electric motor driven centrifugal pump has to be installed in a field, where the static suction and delivery heads are 6 and 8 m respectively. Other head losses are estimated as 25% of total static head. If the required pumping capacity is 1200 lpm and efficiency of pump and motor are 70% and 95% respectively, compute the size of the motor.

IV

**Write an essay on ANY ONE of the following**

**(1x10=10)**

- 1 With the help of neat diagram, describe the basic function, components and working of a grain combine harvester.
- 2 Determine the cost of operation per hour of a 35 hp tractor with 8 x 30 cm seed drill. The costs of tractor and seed drill are ₹ 5.4 lakhs and ₹ 22,000. The recommended operating speed is 4 kmph. Assume the following:

Salvage value	:	10% of Purchase cost
Insurance, tax and housing	:	3% of purchase cost (1% each)
Interest rate per annum	:	12%
Useful life of tractor	:	10 years
Working hours of tractor per year	:	1000 hours
Useful life of seed drill	:	8 years
Working hours of seed drill per year	:	150 hours
Operator / Labour wage	:	₹ 450 per day of 8 hours
Fuel consumption (Diesel)	:	4.25 l/h
Cost of diesel	:	₹ 70 per liter
Lubrication cost	:	20% of fuel cost
Repair and maintenance cost	:	6% of purchase cost per annum

Also find what should be hiring charges per ha, if the field efficiency of this unit is taken as 80%.

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