

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018-19 Examination

Semester: 5
Subject Code: 03110303
Subject Name: Irrigation Engineering

Date: 22/05/2019
Time: 10.30 am to 1.00 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type (All are compulsory) (15)

1. Define Irrigation
2. What is Infiltration?
3. Define irrigation Efficiency.
4. _____ are used to measure evapotranspiration.
 (a) Infitrometer (b) TDS meter (c) Lysimeter (d) Anemometer
5. _____ is used for measurement of flow in rivers and canals.
 (a) Current meter (b) Venturimeter (c) Water meter (d) Orifice meter
6. The water that is not held by the soil but drains out freely under the influence of gravity is called:
 (a) Capillary water (b) Hygroscopic water (c) Irrigation water (d) Gravitational Water
7. The arrangement of individual soil particles with respect to each other into a pattern is called _____.
 (a) Soil Profile (b) Soil structure (c) Soil Texture (d) Soil degradation
8. Infiltration into the soil is determined by the device called _____.
9. The basic formula for calculating discharge through a weir is _____.
10. _____ irrigation is also called as overhead irrigation.
11. Sandy soils are fine textured soil. (True / False)
12. Land leveling is not required for installation of sprinkling irrigation. (True / False)
13. The difference in moisture content between _____ and Permanent Wilting Point is called available water.
14. The minimum land slope required in land irrigated with surface method of water application _____.

15. What is a tensiometer?

Q.2 Answer the following questions. (Attempt any three) (15)

- A) Define irrigation scheduling? What are the advantages?
- B) What is meant by Field Capacity? Explain the field method of determining field capacity.
- C) State five advantages and five disadvantages of sprinkler irrigation.
- D) (i) What is (a) Delta (b) Duty of crop
 (ii) The duty of a crop is 432 hectares/cumec, when delta for the crop is 200 mm. What will be the base period of the crop?

Q.3 A) (i) Discuss area-velocity method of water measurement. (07)

(ii) Find out the discharge in l/s through an orifice 10cm high and 45 cm long in a large tank when the center of orifice is 60cm below the water surface. The coefficient of discharge is 0.61.

- B) What are the criteria on which land levelling depends? Discuss in brief about the laser guided levelling. (08)

OR

- B) Explain the different components of drip irrigation. Give a sketch plan layout of a typical drip irrigation system (08)

Q.4 A) (i) Define the terms Bulk Density, Particle Density and Total Porosity (07)

(ii) A 663cubic cm of soil core taken by a core sampler taken from a field weighed 1.065 kg on oven drying. True specific gravity of soil was 2.65. Determine the total porosity of the soil. How much is the % of pore space in the soil.

OR

- A) (i) How is head loss due to friction in underground pipeline calculated? (07)

(ii) A 500 m long 200 mm diameter pipe is used as underground irrigation water supply system.

The velocity of water flow is 5m/s, the PVC pipe is used which has $\epsilon = 0.00026$ m. Use kinematic viscosity ν as $= 1.007$, Determine the head loss in pipe.

B) (i) Explain in brief crop water requirement.

(08)

(ii) An area of 25ha of crops will be irrigated by a pump working 10hrs a day. Irrigation is desired at 50% soil water depletion. The available water holding capacity of soil is 20cm per meter depth of soil. The mean depth of root zone is 75 cm The conveyance and water application efficiency are 75% and 80% respectively. The mean daily consumptive use rate of the crop is 5mm per day.

Work out the

- (a) Net irrigation requirement
- (b) Gross irrigation requirement
- (c) Irrigation period
- (d) Required capacity of irrigation system.