

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester : IV (New)	Term : II	Academic Year : 2015-16
Course No. : IDE 242	Title : Irrigation Engineering	
Credits : 3 (2+1)		
Day & Date : Friday, 29.04.2016	Time : 14.00 to 17.00	Total Marks : 80

- Note :**
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 a) Discuss factors affecting the infiltration characteristics of soil.
b) Enlist different methods of estimating evapotranspiration. Discuss in detail Blaney-Criddle method.
- Q.2 a) Classify the methods of irrigation to crops.
b) Assume an earth channel on a grade of 0.10 percent, depth of water 40 cm, bottom width 60 cm and side slopes 1.5:1. Calculate the velocity of flow and carrying capacity of the channel. Take the value of 'n' as 0.025.
- Q.3 a) Wheat crop requires 45 cm of irrigation water during 120 days irrigation period. How much land can be irrigated with a flow of 20 litres per second for 22 litres per second for 22 hours a days?
b) Enlist the equipments for land grading and field layout. Explain in brief any one of them.
- Q.4 a) What are the different methods of water measurements? Describe in detail velocity area method.
b) Compute the discharge of rectangular weir 45 cm long with a head of 12 cm under the following conditions.
1) With no end contraction
2) With one end contraction
3) With two end contractions
- Q.5 a) Write in brief how irrigation is beneficial to Agriculture. What are the harmful effects of excess irrigation?
b) Explain in brief the major sources of water for crop plants.
- Q.6 a) State the adaptability and limitations of check basin irrigation method.
b) Define land leveling. State and describe the criteria for land leveling.
- Q.7 Write short notes on.
1) Current meter
2) Furrow irrigation

(P.T.O.)

- Q.8 a) Determine the discharge capacity of an underground concrete pipe line from the following data.
- | | |
|--|---------|
| Diameter of pipe | : 15 cm |
| Length of pipe line | : 150 m |
| Difference in elevation between water levels at pump stand and discharge point | : 2 m |
- Assume value of 'f' as 0.009

- d) Discuss different irrigation efficiencies.
- Q.9 a) Furrows 90 m long and spaced 75 cm apart are irrigated by an initial furrow stream of 2 lps. The initial furrow stream reached the lower end of the field in 50 minutes. The size of the stream was then reduced to 0.5 lps. The cut back stream was continued for 1 hour. Estimate the average depth of irrigation.
- b) Explain in brief different soil moisture constants.
- Q.10 a) Differentiate between.
- 1) Irrigation frequency and Irrigation period
 - 2) Gross irrigation requirement and Net irrigation requirement
- b) Explain in brief different kinds of water.

SECTION "B"

- Q.11 State True or False.
- 1) The useful limit of most tensiometers is at about 0.85 atmospheres.
 - 2) The capillary water is held between tensions of about 31 and 1/3 atmospheres.
 - 3) When the channel flow is steady and the mean velocity is the same at each succeeding cross-section, the flow is non-uniform.
 - 4) The specific surface area of clay is smaller than silt and sand.
 - 5) 1 ha-cm = 10000 litres.
 - 6) A current meter is a device to measure velocity of flowing water.
 - 7) Furrow irrigation requires proper land grading.
 - 8) The depth of water flowing over the weir crest is measured at some point in the weir pond.

- Q.12 Fill in the blanks.
- 1) The mineral between 2 cm and 2 mm in diameter is called _____.
 - 2) The size of Parshall flume is determined by _____.
 - 3) Sprinkler irrigation is not suitable for _____ soils.
 - 4) _____ is the ratio of crop yield to the amount of water depleted by the crop in the process of evapotranspiration.
 - 5) _____ is the actual area irrigated in year from an outlet.
 - 6) The vertical distance from the weir crest to the bottom of the weir pond is called _____.
 - 7) The movement of water from the surface into the soil is termed as _____.
 - 8) The moisture tension of soil at the permanent wilting point ranges from _____ to _____ atmospheres.

