IDE

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: IV (New)	**Term** : II	**Academic Year**	: 2013-14
Course No.	: IDE 242	**Title** : **Irrigation Engineering**		
Credits	: 3 (2+1)			
Day & Date	: Friday, 02.05.2014	**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.
5. Assume necessary assumptions if required.

SECTION "A"

Q.1   a) Explain in brief the major sources of water for crop plants.

b) Write in brief how irrigation is beneficial to agriculture. What are the harmful effects of excess irrigation?

Q.2   a) Classify the methods of irrigation to crops.

b) State the adaptability and limitations of check basin irrigation method.

Q.3   a) A Persian wheel discharges at the rate of 11,000 liters per hour and works for 8 hours each day. Estimate the area commanded by the water lift if the average depth of irrigation is 8 cm and irrigation interval is 15 days.

b) Enlist the equipments for land grading and field layout. Explain in brief any one.

Q.4   a) What are the different methods of water measurements? Describe velocity-area method in detail.

b) Compute the discharge of rectangular weir 45 cm long with a head of 12 cm under the following conditions.
(i) With no end contraction, (ii) With one end contraction, (iii) With two end contractions.

Q.5   a) Enlist different methods of estimating evapotranspiration. Discuss Thonthwaite method in detail.

b) Discuss the factors affecting the infiltration characteristics of soil.

Q.6   a) Assume an earth channel on a grade of 0.10 per cent, 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.

b) Define land leveling. State and describe the criteria for land leveling.

Q.7   Write short notes on (Any Two)
1) Tensiometer
2) Border irrigation
3) Irrigation scheduling

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.

(P.T.O.)

b) Explain in brief different kinds of water.

Q.9 a) Determine the mean depth of irrigation in a furrow 75 m long and spaced 60 cm
apart with an initial flow of 1.5 1ps for a period of 40 minutes. The flow was th
reduced to 0.5 1ps after reached the tail end of furrow and the irrigation was co
for another 45 minutes.

b) Explain in brief different soil moisture constants.

Q.10 a) Differentiate between following.

    1) Irrigation frequency and Irrigation period.

    2) Gross irrigation requirement and Net irrigation requirement

b) Discuss different irrigation efficiencies.

SECTION "B"

Q.11 State True or False.

    1) The arrangement of individual soil particles with respect to each other in to a
pattern is called as soil structure.

    2) Sprinkler irrigation is not suitable for very fine textured soils such as heavy cla

    3) The depth of water flowing over the weir crest is measured at some point in the
pond.

    4) The specific surface area of clay is smaller than silt and sand.

    5) Transpiration ratio is the amount of water transpired by a crop in its growth to
produce unit weight of dry matter.

    6) A current meter is a device to measure velocity of flowing water.

    7) Capillary porosity is the percentage of pore space filled with air after the soil h
drained to field capacity.

    8) When the channel flow is steady and the mean velocity is the same at each
succeeding cross-section, the flow is non-uniform.

Q.12 Fill in the blanks

    1) The moisture tension of soil at the permanent wilting point ranges from _____
to _____atmospheres.

    2) _____ is a vertical section through the soil mass.

    3) The capillary water is held between tensions of about _____and_____
atmospheres.

    4) _____ is the ratio of crop yield to the amount of water depleted by the c
the process of Evapotranspiration.

    5) _____ is the actual area irrigated in a year from an outlet.

    6) The horizontal distance from the ends of the weir crest to the sides of the weir
called as _____.

    7) The movement of water from the surface into the soil is termed as _____

    8) The mineral between 2 cm and 2 mm in diameter is called_____.

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