Total No. of Questions : 8]   [Total No. of Printed Pages : 3

Roll No. ....

CE–602

B. E. (Sixth Semester) EXAMINATION, June, 2009

(Civil Engg. Branch)

IRRIGATION ENGINEERING

(CE – 602)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *five* questions. Suitable data can be assumed wherever necessary. All questions carry equal marks.

1. (a) Describe the sprinkler method of irrigation with its merits and demerits.   10

   (b) Find the time required to cover an area of $2 \cdot 0$ hectare when a tube well is discharging at the rate of $0 \cdot 03$ cumecs for irrigating Rabi crops. Average depth of flow is expected to be $10 \cdot 0$ cms, Average infiltration rate for the soil may be taken as 5 cm/hour, also find the maximum area which can be irrigated with the available discharge.   10

2. (a) Name different crop seasons and crops under them. What is crop rotation ? Describe briefly.   5, 5

   (b) After how many days will you supply water to soil in order to ensure efficient irrigation of the given crop if

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field capacity of soil is 37%, permanent wilting point is 20%, density of soil is 2 gm/cm^3, effective depth of root zone is 100 cm and daily consumptive use of water for the crop is 10 mm.   10

3. (a) Describe various method of determination for reservoir capacity using inflow and demand data.   10

   (b) Describe in detail the various surveys to be conducted for collecting data and the drawings to be prepared using those data.   10

4. (a) Explain the procedure for the design of a vertical drop weir.   10

   (b) Name different river training works. Describe any *one* in detail with design specifications.   10

5. (a) Using Kennedy's theory design a channel section for the following data :   10

   Discharge Q = 14 cumecs

   Value of N = 0·0225

   Critical velocity ratio *m* = 0·8

   Side slopes : $\frac{1}{2}$: 1, Bed slope 1 in 5000.

   (b) Design a trapezoidal shaped concrete lined channel to carry a discharge of 100 cumecs at a slope of 30 cm/km. The side slopes of the channel are 1·5 : 1. The value of N may be taken as 0·016. Assume the limiting velocity as 1·0 m/sec.   10

6. (a) Name various canal falls. Describe any *one* in detail. 10

   (b) Name various cross drainage works and describe with neat sketches.   10

7. (a) State and discuss assumptions and limitations of Dupuit theory. 5

   (b) A gravity well has a diameter of 50 cm. The depth of water in the well is 35 metres before pumping is started. When pumping is being done at the rate of 25000 litres per minute, the drawdown in a well 10 metres away is 3·0 metres and another well 25 m is 2·0 metres. Determine : (i) Radius of zero drawdown (ii) Coefficient of permeability (iii) Drawdown in the well (iv) Specific capacity of the well (v) Maximum rate at which water can be pumped from the well. 15

8. Write short notes on any *four* of the following : 5 each

   (i) Standards of water for irrigation

   (ii) Well losses

   (iii) Canal losses

   (iv) Weirs and Barrage

   (v) Reservoir sedimentation

   (vi) Drip irrigation

   (vii) Duty and Delta

   (viii) Launching aprons

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