407 - 40
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(75)

B.E. Civil VII CBGS
Irrigation Engg

04.12.15

QP Code : 5930

(3 Hours)   Total Marks: 80

N.B (1) Question 1 is compulsory
    (2) Solve **any three** questions out of remaining five questions
    (3) Draw neat sketches wherever necessary
    (4) Assume suitable data if necessary and state it clearly.

Qu.1. Solve any four from following

(20)

    (a) Define irrigation and irrigation engineering and explain the necessity of irrigation in India
    (b) Define hydrology and explain with neat sketch hydrological cycle.
    (c) Explain the terms : aquifer, aquiclude and aquifuge
    (d) What are the various forces that acts on gravity dam, explain each of them.
    (e) What do you understand by canal lining, state its advantages.

Qu. 2

    (a) Derive relation between 'duty' and 'delta'.   (5)
    (b) An irrigation canal has gross command area of 80,000 hectares out of which 85% is culturable command
    area. The intensity of irrigation for Kharif crop is 30% and for Rabi crop is 60%. Find the discharge   (8)
    required at the head of the canal if the duty at its head is 800 hectares/cumec for Kharif and for Rabi is
    1700 hectares/cumec.
    (c) Describe drip irrigation also state what are the favorable conditions to use drip irrigation and sprinkler   (7)
    irrigation.

Qu 3.

    (a) State methods of computing average rainfall over the basin and explain any one of them.   (5)
    (b) What is unit hydrograph and S hydrograph. State significance of each one   (6)
    (c) The ordinates of a 4hr unit hydrograph are given below. Determine the ordinates of 12 hr unit hydrograph.   (9)

Time (hour)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate in m3/sec	0	24	84	159	184	151	103	64	36	17	6	0

Qu.4..

    (a) Derive an equation for discharge from a well in an unconfined aquifer   (6)
    (b) A 40 cm diameter well fully penetrates an unconfined aquifer whose bottom is 75 m below the undisturbed   (9)
    ground water table. When pumped at a steady rate of 1.40 m^3/min. The drawdowns observed in
    observation wells at radial distances of 4 m and 14 m are 4m and 2m respectively. Determine the
    drawdown in the well.
    (c) Explain recuperation test.   (5)

Qu. 5

    (a) What do you mean by reservoir sedimentation. State methods to control sedimentation.   (5)
    (b) Distinguish with neat sketches between   (5)
        (i)   Low gravity dams and high gravity dams
        (ii)   Theoretical and practical profile of gravity dam
    (c) Explain causes of failure of earth dam.   (6)
    (d) Describes usefulness of arch dam and buttress dam   (4)

Qu. 6

    (a) Design an irrigation channel to carry a discharge of 40 cumec. Take N=0.0225 and critical velocity ratio as   (8)
    1. The channel bed slope is 0.20 meters per kilometers.
    (b) Write short note on diversion head works with sketch.   (6)

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