BE/CE/OLD/Sem-VII/ IE/ 19/5/16

QP Code : 29753

(3 HOURS) TOTAL MARKS:100

Note: [1] Q.No.1 is compulsory.
[2] Attempt any four questions out of remaining six questions
[3] Assume any data if required and mention clearly.

Q.No.1 [a] Define irrigation. What is the necessity of irrigation ? [5]

[b] Explain the terms : aquifer, aquiclude and aquifuge. [5]

[c] Describe various methods of computing average rainfall over a basin. [5]

[d] Explain the term 'storage coefficient' and 'coefficient of transmissibility'. [5]

Q.No.2 [a] Explain various method of Irrigation with neat sketches. [10]

[b] Explain various types of Rain-gauge with neat sketches. [10]

Q.No.3 [a] A canal takes off a reservoir to irrigate the areas given below. 40% of the water required for irrigation is assumed to be available directly for precipitation. Channel conveyance losses are 15%. Reservoir losses are 10%. What would be the capacity of reservoir needed? (The reservoir to be filled only once a year) [10]

Crop	Base period (days)	Duty at the field (ha/cumec)	Area under crop (ha)
Wheat	140	1700	400
Sugarcane	320	800	600
Rice	120	900	300
Cotton	220	1200	1200
Bajra	100	1200	600

[b] What is hydrograph ?. Draw a single peaked hydrograph and explain its components. [10]

Q.No.4 [a] Explain various factors affecting Run-off . [10]

[b] Find the ordinates of a storm hydrograph from a 3hr storm with rainfall of 2, 6.75 and 3.75 cm during subsequent 3 hr intervals. The ordinates of hydrograph are given in the following table:

Hours	3	6	9	12	15	18	21	24	3	6	9	12	15	18	21	24
Ordinates of Unit hydrograph {cumec}	0	110	365	500	390	310	250	236	175	130	95	65	40	22	10	0

Assume an initial loss of 5 mm, infiltration index of 2.5 mm/hr and base flow of 10 cumecs. [10]

[TURN OVER]

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Q.No.5 [a] Derive an equation for discharge from a well in an unconfined aquifer. [10]

[b] Explain various types of reservoirs. What do you understand by multipurpose reservoir?. [10]

Q.No.6 [a] A rectangular dam is 3m at the base. Compute the maximum permissible height H (a) when no tension is permissible, and (b) when the factor of safety against sliding is 1.5. Given the following :

(i) μ =0.5, (ii) density of masonry =24 times the of water, and (iii) c=1. What will be corresponding values of H if uplift is neglected. [10]

[b] Discuss the causes of failure of earth dams. [10]

Q.No.7 Write short notes on following: [5x4]

(a) Lined and Unlined Canal

(b) Silt extractor and silt ejector

(c) Cross Drainage Work

(d) Reservoir Planning