



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 100702

Roll No.

B. Tech.

(SEM. VII) (ODD SEM.) THEORY
EXAMINATION, 2014-15

WATER RESOURCE ENGINEERING (Only for Civil)

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt all questions.
 - (2) All questions carry equal marks.
 - (3) If required any missing data, then choose suitably.

1 Attempt any FOUR parts of the following : **5×4=20**

- (a) The rainfall rates for successive 30-minute intervals up to 4 hours are given below. If the surface runoff is 3.6 cm, determine ϕ and W indices :

Time(min)	0	30	60	90	120	150	180	210	240
Rainfall intensity (cm/h)	0	1.3	2.8	4.1	3.9	2.8	2.0	1.8	0.9

- (b) Find out the field capacity of a soil for the following data :
- Root zone depth = 2m
Existing water content = 5%
Dry density of soil = 15 kN/m^3
Water applied to the soil = 500m^3
Water loss due to evaporation and deep percolation = 10%
Area of plot = 1000 sq. meters.

- (c) Write a short note on the following :
- Depth area duration (DAD).
 - Probable maximum precipitation (PMP)
- (d) State the various methods of determination of the mean precipitation over a given catchment area.
- (e) Explain the term :
- Infiltration indices Φ -Index
 - Infiltration indices W-Index
- (f) Explain various methods determining flood discharge in a stream.

2 Attempt any TWO questions : **10×2=20**

- (a) Discuss the various factors affecting runoff from catchment.
- (b) Describe how Snyder's synthetic unit hydrograph is derived.
- (c) Water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 40% and for B is 35% both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the kor depth for crop A is 10 cm and for B is 16 cm.

Attempt any TWO questions :

10×2=20

- (a) Discuss the various advantages and disadvantages of the irrigation.
- (b) Design an irrigation channel on Kennedy's theory, to carry a discharge of 45 cumecs.
Take $N = 0.0225$ and $m = 1.05$. The channel has a bed slope of 1 in 5000.
- (c) Channel section has to be designed for the following data :
Discharge (Q) = 30 cumecs
Silt factor $f = 1.00$
Side slope $S = 0.5 : 1$
Find also the longitudinal slope.

4 Attempt any TWO questions :

10×2=20

- (a) What do you mean by river training ? Describe the method used for river training.
- (b) Describe the working of Gibb's module with neat sketch.
- (c) Sketch the layout of canal head works and describe its components.

5 Attempt any TWO questions :

10×2=20

- (a) A tube well of 30cm diameter penetrates fully in an artesian aquifer. The strainer length is 15m. Calculate the yield from the well under a drawdown of 3m. The aquifer consist of sand of effective size of 2.0 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

(b) Define the following terms :

- (i) Aquifer
- (ii) Aquiclude
- (iii) Aquifuge
- (iv) Aquitard
- (v) Porosity

(c) Define the following terms in brief :

- (i) Well losses
 - (ii) Specific capacity
 - (iii) Well efficiency.
-