Printed Pages : 5 | 742 | **ECE-702**

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

Paper ID : 100702   Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VII) THEORY EXAMINATION, 2015-16

WATER RESOURCE ENGINEERING

[Time:3 hours]   [Total Marks:100]

SECTION-A

1. Attempt all question. All questions carry equal marks.:

                                 $(2 \times 10 = 20)$

(a) State various Components of a single peaked hydrograph.

(b) Explain Hydrological system.

(c) Differentiate between PET & AET.

(d) Explain W & ϕ index.

(e) State various types of Precipitation.

(f) List methods of computing runoff from a catchment..

(g) List various methods of Irrigation.

(h) Explain well losses and well shrouding.

(i) Explain synthetic and s hydrograph.

j) What are the various methods of Well development?

SECTION-B

Attempt any **five** of the following. (10×5=50)

2. What is the concept of river training? Explain river training for discharge. depths and sediments. List various types of river trainging works.

3. What are the various factors governing the selection of suitable site of a Tube-well?

4. Differentiate between Kennedy's and Lacey's theory for desigh of alluvium channels. Explain defects in Lacey's theory.

5. Design a channel section using Kennedy's theory for a discharge of 45 cumecs. take Kutter's coefficient, N=0.0225. C.V.R.M=1.05. side slope=0.5H:1V, Bed slope=1in 5000.

6. Write short notes on L-section and X-section of a canal, Garret's diagram, initial and final regime of a channel, aquifer and porosity.

7. Calculate the number of days after which the water has to be supplied to the soil in order to ensure sufficient irrigation if:

    i   Field capacity of the soil is 28%.

    ii.   Permanent wilting point is 13%.

    iii.   Dry density of soil is 1.3gm/cc.

    iv.   Effective depth of root zone is 70cm.

    v.   Daily consumptive use of water for given crop is 12mm. Assume optimum soil moisture as 80% of available moisture.

8. The Base period, Duty at the field and the Area under the crop under a Distributory taking off from a reservoir are given in table below. Taking canal losses as 10% and reservoir losses as 15%, compulte the reservoir capacity.

CROP	BASE PERIOD (days)	DUTY AT THE FIELD (ha/cumecs)	AREA UNDER THE CROP (ha)
Bajri	120	2000	1500
Cotton	200	1400	1400
Rice	120	900	4000
Wheat	120	1800	6800

9. (i) What is an Outlet? Explain various types of outlets with examples and stetches.

   (ii) What are various regulation works in canals? Explain about the location of falls and various types of falls.

SECTION-C

Attempt any **two** parts. $(15×2=30)$

10. (i) Explain water logging and its causes. Explain adverse effects of water logging. What are the various methods adopted as Anti water logging measures.

   (ii) Using Lacey's theory, design an irrigation channel for the following data:

   Discharge, $Q = 50 m^3/sec$

   Lacey's silt factor, $f = 1.1$

   Trapezoidal section

   Side slope = 0.5h:1V

11. Describe an expression for the yield of Tube-wells for the case of an unconfined aquifer two tube-wells each of 20cm diameter and spaced at 100m distance penetrate fully a confined aquifer of 12m thickniss. Calculate the discharge if only one well is discharging under a depression head of 3m. What will be the percentage decrease in the discharge of the well it both the wells are discharging under the same depression head of 3m?

Take R=250m for each well and k=60m/day.

12. (i) Following are the storms hydrograph ordinates of a river draining a catchment area of 425km² due to 6hr isolated storm. derive the ordinate of a 6hr unit hydrograph for the catchment.

Time(hr)	-6	0	6	12	18	24	30	36	42
dicharge(m3/sec)	10	10	30	87.5	115	102	86	71	59

48	54	60	66	72	78	84	90	96	102
47	40	32	28	21	17	15	12	12	12

(ii) Design a conceate lined channel to carry a discharge of 200 cumecs with bed slope of 1 in 4000. The side slope is 2H:1V and manning's coefficient, n=0.014. The limiting velocity in the canal is 2m/sec.

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