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Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE  
EXAMINATION, APRIL 2015**

CE/PTCE 09 601—HYDROLOGY AND IRRIGATION ENGINEERING

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.*

1. Define hydrograph.
2. Define duty and delta.
3. What is meant by spoil banks ?
4. What is a flow duration curve ?
5. Write about guide banks.

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

6. What are the different types of precipitation
7. Write the factors considered for the selection of site for a reservoir.
8. Draw a typical layout of a diversion head works and discuss the functions of each component
9. What are the advantages and disadvantages of canal lining ?
10. Discuss the various causes of losses in channels.
11. Write about river meandering.

(5 × 4 = 20 marks)

**Part C**

*Answer all questions each question carries 10 marks.*

12. (A) (i) Explain different forms of precipitation.  
(ii) What is runoff ? Explain various factors affecting runoff.

Or

Turn over

- (B) Find the ordinates of a storm hydrograph resulting from a 3 hr. storm with rainfall of 2, 6.75 and 3.75 cm. during the subsequent 3 hr. intervals. The ordinates of unit hydrograph are given in the table :

Time (hr.)	3	6	9	12	15	18	21	24	3	6	9	12	15	18	21	24
Ordinates of unit hydrograph	0	110	365	500	390	310	250	235	175	130	95	65	40	22	10	0

13. (A) (i) Describe in brief the various investigations required for reservoir planning.  
(ii) Explain Khosla's method of independent variables. How do you apply correction for (a) thickness of floors and (b) interference of piles.

Or

- (B) (i) The base period, intensity of irrigation and duty of water for various crops under a canal system are given in table below determine the reservoir capacity if the culturable commanded area is 40000 ha. Canal losses are 20 % and reservoir losses are 10 %

Crop	Base period (days)	Duty (ha/cumecs)	Intensity of irrigation (%)
Wheat	120	1800	20
Sugarcane	360	1700	20
Cotton	180	1400	10
Rice	120	800	15
Vegetable	120	700	15

- (ii) Explain silt excluders.

14. (A) A channel is to be designed for the following data

Discharge  $Q = 5$  cumecs ;

Silt factor  $f = 1$  ;

Side slopes  $\frac{1}{2} H : 1V$

Also determine bed slope. Use Lacey's silt theory.

Or

(B) Determine the dimensions of the irrigation channel for the following data :

$B/D$  ratio = 3.7;  $N = 0.0225$  ;  $m = 1$ ,  $S = 1/4000$  ; side slope = 1/2 H : 1 V.

Also determine the discharge which will be flowing in the channel.

15. (A) The annual flood peak flows recorded at a gauging site for the duration of 17 years in  $m^3/s$  are given below :

3000, 4400, 6000, 3500, 2900, 4800, 3900, 3300, 6700, 5400, 4300, 3700, 4200, 9000,  
4000, 3600, 5100.

Construct a flood frequency curve and find the flood peak for a return period of 100 years and 50 years

*Or*

(B) What is meant by river training works and write about different types of groynes.

(4 × 10 = 40 marks)