Roll No .....

CE-5005 (1) (CBGS)

B.E. V Semester

Examination, December 2017

Choice Based Grading System (CBGS)

Water Resources Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) Parts of the same question should be attempted at one place.

iii) Elaborate your answers with neat sketches wherever necessary.

1. a) What do you mean by duty and delta? What are various factors affecting duty? 7

   b) Briefly explain various methods of irrigation. 7

2. a) What do you mean by lining of canals? What are various materials used in lining? 7

   b) Discuss the salient features of Kennedy's theory for the design of canals. Explain how Kennedy's theory is an improvement over Lacey's theory. 7

3. a) Explain various types of cross drainage works with neat sketches. 7

b) Explain various types of spillways along with neat sketches. 7

4. a) The stream flow data due to 4 hour duration of rainfall which occurred over a drainage area of 75km^2 is given below. Derive a 24 hour unit hydrograph from the given data. 7

Time (h)	0	4	8	12	16	20	24	28	32	36	40
Flow (m^3/s)	30	70	95	145	295	320	210	130	80	67	30

b) Define unit hydrograph. What are various limitations of unit hydrograph theory? How will you derive S-curve hydrograph from a given unit hydrograph? 7

5. a) Explain the significance of IDF curves and DAD curves. The isohyets for annual rainfall over a catchment were drawn. The areas of strips between isohyets are indicated below. Find the average depth of annual precipitation over the basin. 7

Isohyets (cm)	9-10	10-11	11-12	12-13	13-14	14-15
Area between Isohyets (km^2)	34	80	100	90	76	25

b) What do you mean by infiltration capacity and runoff? What are various factors affecting infiltration capacity? Explain the significance of infiltration capacity curve. 7

6. a) What are various empirical methods of flood estimation? Explain various measures to control flood in brief. 7

b) Route the following flood through a river reach for which the Muskingum coefficients K and x are 1.6 day and 0.3 respectively. At time t=0, the outflow discharge is 40m^3/s. 7

Time (h)	0	4	8	12	16	20	24	28	32	36	40
Inflow (m^3/s)	40	103	262	400	476	345	208	172	130	95	65

7. a) What are various types of aquifer? A 25cm diameter well penetrates 18m below the static water table. After 24 hours of pumping at a steady rate of 5400 litres/minute, the water level in attest well at 90m is lowered by 0.5m, and in a well 30m away the drawdown is 1.2m. 7

i) What is the transmissibility of the aquifer?

ii) Also determine the drawdown in the main well.

b) Explain various types of open wells. What do you mean by specific capacity and specific yield of a well? 7

8. a) What do you mean by consumptive use? How will you determine it? 7

b) The ordinates of a 5 hour unit hydrograph for a catchment of 400km^2 are as follows: 7

Time (h)	0	5	10	15	20	25	30	35	40	45
Ordinates (m^3/s)	0	38	74	100	170	90	60	25	12	0

Compute the ordinate of 2 hour unit hydrograph using S-Curve method.

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