SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of pages:02
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May 2018
Reappear.
2011 Batch onwards

B.Tech. || CIVIL || 7th Sem

HYDROLOGY AND DAMS

Subject Code: BTCE- 817

Paper ID:

Time allowed: 3 Hrs

Max Marks: 60

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (10x 2marks)

Q. 1. Short-Answer Questions:

(a)What are the component of hydrologic cycle?
(b)What are Arch and Buttress Dam?
(c)What is the limitation of Unit Hydrograph?
(d)Enlist the methods of determining the average depth of precipitation over the basin.
(e)What is intensity Duration frequency curves?
(f)What are the Various advantages of buttress dam?
(g)What are the advantages of the gate spillway.
(h)Write down the various forces that are to be considered in design of gravity dam.
(i)What is the formula for optimum number of Rain gauges?
(j)What are the modes of failure of the dam? Write down the formula to avoid sliding failure of the dam.

PART B (5×8marks)

Q.2. From the 4h unit hydrograph derive 12h unit hydrograph for same basin. Also sketch this unit hydrograph. What is peak value of discharge. CO1

Time (hour)	Ordinates of 4h unit hydrograph
0	0
4	20
8	80
12	130
16	150
20	130
24	90
28	52
32	27
36	15
40	5
44	0
48	-

OR

Show that most economical central angle of an arch dam based on thin cylindrical theory is 133°34`.explain the limitation of theory. CO1

Q. 3. A watershed has five rain gauge stations installed in the area and the amount of rainfall is given. Find the required optimum number of non-recording rain gauges for this watershed, assume an error of 10% in the estimation of mean rainfall. CO2

Rain Gauge station	1	2	3	4	5
Annual Rainfall mm	100	120	190	95	125

OR

CO2

The area between the two Isohyets are given in the table. Obtain the equivalent uniform depth.

Isohyets(mm)	70	90	100	125	140	150	165	180
Area b/w Isohyets(mm^2)	60	275	260	150	380	215	215	120

Q. 4. For a data of maximum recorded flood of river, the mean and standard deviation are $4200m^2/s$ and $1705m^2/s$ respectively. using Gumbel's extreme value distribution, estimate the return period of design flood of $9550m^2/s$. Assume an infinite sample size. CO3

OR

Explain the terms CO3

a) Hyetograph
b) Index of wetness
c) Interception and percolation
d) Various Factors affecting Infiltration

Q. 5. A gravity dam is 10m high, its top width and base width are 9m each. The front face is vertical. Assume that weight of concrete is 132400 Kg/m^3 and water is stored to top of the dam. CO4

a) Test the stability of the dam against overturn.
b) Determine the compressive stress and principle stress at Toe and Heel of the dam.

OR

Explain the elementary profile of the gravity Dam under the following reservoir condition CO4

a) Full condition.
b) Empty condition

Q. 6. Determination of the phreatic line by graphical method with diagram. CO4

OR

Explain the components of the Earthen dam with details? CO4