

Enrolment No. _____

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Date: 21-06-2014

Total Marks: 70

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- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

Q.1	(a)	Discuss briefly factors affecting runoff.													07
	(b)	Using Gumbel's method estimate 150 year flood for the river, having other data as per table given below,													07
		Return period(years)							Peak flood(m ³ /s)						
		100							525						
		50							465						
Q.2	(a)	The ordinates of unit hydrograph for 3 hour duration are given below. Calculate the ordinates of a 6 hour unit hydrograph and draw a neat sketch.													07
		Time in hours	0	3	6	9	12	15	18	21	24	27	30	33	
		3hr UHO in cumecs	0	9	12	36	72	95	125	80	50	30	15	0	
	(b)	Derive Thiem's formula for unconfined aquifer.													07
		OR													
	(b)	Explain the following terms in respect to ground water: specific yield, permeability and transmissibility, perched aquifer, storage coefficient.													07
Q.3	(a)	Discuss briefly methods of flood control.													07
	(b)	A well is located in a 30m thick confined aquifer of permeability 40 m/day and storage coefficient of 0.004. If the well is pumped at the rate of 1700 litres per minute, calculate the drawdown at a distance of 50 m from the well after 20 hours of pumping.													07
		OR													
Q.3	(a)	List out flood forecasting methods and discuss any one method briefly.													07
	(b)	A 30 cm diameter well penetrates 25 m below the static water table. After 24 hours of pumping @ 6000litres/minute the water level in a test well at 80 m is lowered by 0.57m, and in a well 40 m away the drawdown is 1.15 m. What is the transmissibility of the aquifer?													07
Q.4	(a)	Explain factors affecting evaporation.													07

	(b)	For a catchment area of 40km^2 , the following mass curve of rainfall was recorded.								07	
		Time from start of storm(h)	0	2	4	6	8	10	12	14	
		Accumulated rainfall(mm)	0	8	15	62	70	85	90	100	
		If the volume of runoff due to the storm measured is $1.6 \times 10^6 \text{ m}^3$, estimate the ϕ index of the catchment.									
		OR									
Q.4	(a)	Explain the factors affecting infiltration capacity.									07
	(b)	Determine the optimum number of rain gauges in a catchment using the following data: (1) Number of rain gauge = 6 (2) Mean annual precipitations at gauge(cm) = 32,55,41,50,51,68 (3) Permissible error = 8%									07
Q.5	(a)	Describe 'Hydrological cycle' with neat sketch.									07
	(b)	Explain S-curve hydrograph.									07
		OR									
Q.5	(a)	Explain 'tipping bucket type' recording rain gauge with a neat sketch.									07
	(b)	Define 'unit hydrograph'. Also discuss limitations and uses of unit hydrograph theory.									07
