GANPAT UNIVERSITY

B. Tech. Semester: VII (CIVIL)

CBCS Regular Theory Examination – Nov-Dec, 2016

2C1709 WATER RESOURCE ENGINEERING - I

Time: 3 Hours   Total Marks: 70

Instructions: 1   Answer to the two sections must be written in separate answer books.
2   Assume suitable data if required.
3   Figures to the right indicate full marks

Section-I

Q No	Question	Marks
Q-1(a)	What is meant by 'Water Resources Engineering'? State the importance of the Water Resources Engineering.	6
Q-1(b)	State the different sectors of Water Management. Briefly state the functions of each of them.	6
	OR	
Q-1(a)	Define a "Pump". Narrate the characteristics of pump with a typical Characteristic curve of a Centrifugal Pump.	6
Q-1(b)	Define the term 'Specific Energy'. State its equation and describe each terms. Draw a typical specific energy curve stating the information it gives.	6
Q-2(a)	What we mean by 'Unsteady Flow'? State the causes of 'unsteady flow' in a pipeline. State the adverse effects caused by 'Unsteady Flow' in a pipeline.	6
Q-2(b)	A booster pump is installed in the pipeline, which joins two reservoirs A and B at the elevations 100 m and 84.75 m respectively. The dia of pipe is 300 mm, length of pipe is 2000 m and f=0.20. If the energy added is 20 m, determine the flow rate in the pipe line. [Neglect minor losses]	5
	OR	
Q-2(a)	Briefly describe the techniques deployed to avert adverse effects of possible pressure extremities in a pipe line. .	6
Q-2(b)	Find the rate of flow and conveyance for a rectangular channel 8.5 m wide for uniform flow at a depth of flow 2.50 m. The channel is having bed slope as 1 in 1000. Take Chezy's constant C=55 State whether the flow is tranquil or rapid.	5
Q-3	Answer any **three** of the followings:	12

(1)   Write a short notes on 'Hydraulic jump'.
(2)   Write a short note on 'Stilling Basin'.
(3)   Briefly describe the 'Air Chamber' with a neat sketch, showing the details.
(4)   Describe the 'Generalized Open Channel hydraulic Models'.
(5)   Write a short note on 'Flood Plain Management'.

Section-II

Q No	Question	Marks
4(a)	Derive the Dupit's equation for discharge through an unconfined aquifer	6
4(b)	A well having dia of 30 cm fully penetrates a confined aquifer of 20 m. If coefficient of permeability k= 45 m/d, and under steady state of pumping, the drawdown at the well is 3.0 m and radius of influence is 300 m; Calculate the discharge Q in lpm.	6

OR

Q No	Question	Marks
4(a)	Define [i] Confined Aquifer [ii] Unconfined Aquifer [iii] Water table [iv] Perched Water table [v] Effluent stream [vi] Influent stream.	6
4(b)	Define the flood? Describe Hydraulic and hydrologic method of flood routing.	6
5(a)	What are probability functions? Enumerate all functions and explain any two in detail.	6
5(b)	What is Stochastic Hydrology? Give applications of stochastic hydrology in the field of water resources engineering.	5

OR

Q No	Question	Marks
5(a)	Obtain the sample estimates of mean, standard deviation, coefficient of variation, coefficient of skewness for the following observed data of daily maximum rainfall (mm) for 20 years	6

Year	1	2	3	4	5	6	7	8	9	10
Daily rainfall(mm)	116	39	99	65	90	153	95	72	62	58
Year	11	12	13	14	15	16	17	18	19	20
Daily rainfall(mm)	52	32	76	84	93	114	108	132	88	48

Q No	Question	Marks
5(b)	What is Hydraulic and hydrologic method of flood routing? Write down the basic equations used in both methods.	5
Q-6	**Answer any <u>three</u> of the following:-**	12
(1)	Probabilities (objective and subjective)	
(2)	Complementarity and Conditional probability	
(3)	Prism storage and wedge storage	
(4)	Write a short note on the 'Pumping Test'.	
(5)	Write a short note on 'Ground Water Resources'	

END OF PAPER