Total No. of Questions : 8]

SEAT No. : ____

P3771

[Total No. of Pages : 2

[4760]-78

M.E. (WREE) (Civil Engineering)

HYDROLOGY AND GROUNDWATER

(2012 Course) (Elective-I) (Semester-I)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of electronic pocket calculator is allowed.***
6) ***Assume suitable data if necessary.***

SECTION-I

Q1) a) With the help of meteorological phenomenon explain the process of rainfall. **[6]**

b) The ordinates of a 3-hr unit hydrograph of a basin are as follows. Derive the flood hydrograph due to a storm of 3-hr producing a rainfall excess of 4 cm. Assume a constant base flow of 3 cumec. **[10]**

Time (hours)	0	3	6	9	12	15	18	21	24	27
3hr UGO (m^3/s)	0	1.5	4.5	8.6	12	9.4	4.6	2.3	0.8	0

Q2) a) Write a note on basics of time series models. **[8]**

b) Write a short note on Risk, Reliability and Safety Factor. **[8]**

Q3) a) What is meant by 'Return Period'. Give few formulae to determine it. **[8]**

b) Explain Lognormal distribution. **[8]**

P.T.O.

Q4) Write short note on: **[18]**

a) Minimum density of rain gauge stations.

b) Gumbel's method.

c) Envelop curve.

SECTION-II

Q5) a) Briefly explain experimental verification of Darcy's law. **[8]**

b) A well with a radius of 0.5m penetrates completely a confined aquifer of thickness 40m and permeability 30 m/day. The well is pumped so that the water level in the well remains at 7.5m below the original piezometric surface. Assuming that the radius of influence is at 500m, compute the steady state discharge from the well. **[8]**

Q6) a) Write a note on sea water intrusion. **[8]**

b) Enlist and briefly explain types of wells. **[8]**

Q7) a) Explain methods of artificial recharge. **[8]**

b) Write a note on ground water budget. **[8]**

Q8) Write short notes on: **[18]**

a) Ground water movement.

b) Groundwater resource of India.

c) Method of images.

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