Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech., Winter 2017 - 18 Examination

Semester: 1 **Date: 26-12-2017**

Subject Code: 03214101 **Time: 02:00PM to 04:30PM**

Subject Name: Applied Hydrology **Total Marks: 60**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 **A)** Define Base Flow. Explain the methods of separation of base flow. **(05)**

B) Explain the different methods of reservoir routing. **(05)**

C) Define the following: (i) Valley storage, (ii) Bank Storage, (iii) Dead Storage, (iv) Live Storage and (v) Surcharge Storage **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**

A) Define: (i) Recurrence Interval and (ii) Frequency (chance%) of a storm. Explain the procedure to derive 200-year recurrence interval flood.

B) Why change in duration of Unit Hydrograph is required? Explain Superposition Method.

C) What are the factors affecting transpiration?

D) In a 450-ha watershed the CN value was assessed as 80 for AMC-III. Estimate the value of direct runoff volume for the following 4 days of rainfall. The AMC on July 1st was of category III. Use SCS-CN standard equations.

Date	Aug 1st	Aug 2nd	Aug 3rd	Aug 4th
Rainfall(mm)	60	30	35	20

Q.3 **A)** Discuss the procedure to obtain **(07)**

(i) Area- Elevation Curve

(ii) Capacity- Elevation Curve

B) (i) Explain the methods to estimate the average rainfall for a given rainfall data. **(08)**

(ii) The rainfall values at gauging stations and corresponding areas of Theissen's Polygon for a drainage basin are as follows:

Station	A	B	C	D	E	F	G
Area of Theissen's Polygon(km^2)	160	135	92	110	68	75	30
Rainfall (cm)	10.0	13.5	9.1	12.6	11.2	14.0	10.8

OR

B) State various methods to estimate design flood. Explain Unit Hydrograph Method in detail. **(08)**

Q.4 A) Using Sequent Peak Algorithm and using the following data determine reservoir capacity **(07)**

Month	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Inflow(Mm^3)	350	600	650	450	400	400	350	300	400	550	650	700
Outflow(Mm^3)	350	350	400	450	650	600	550	500	450	450	300	350

OR

A) Route the following flood, using Muskingum method, through a reach for which the K= 24 hr and x=0.20. The outflow discharge is 50 m^3/s at time t=0. Also determine the peak lag and attenuation. **(07)**

Time(hr)	0	8	16	24	32	40	48	56	64	72	80	88	96
Inflow(m^3/s)	50	70	165	250	240	200	170	130	110	90	80	70	64

B) What is Infiltration? Explain the factors affecting the rate of infiltration. **(08)**