Roll No. | | | | | | | | | | |

B.E. / B.Tech. (Part Time) DEGREE ARREAR EXAMINATIONS, NOV / DEC 2013

CIVIL ENGINEERING

VI Semester

PTCE 514 Hydrology

(Regulation 2005)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART- A (10 x 2 = 20 Marks)

1. Name the allied sciences wherein hydrology depends on.
2. Give a brief about the orographic precipitation.
3. State the principles used in Penman method.
4. Compare single and double ring infiltrometers.
5. State the assumptions of unit hydrograph.
6. Sketch a typical hydrograph and mention its components.
7. Differentiate sixth tenth method of velocity observation from three point method.
8. Bring out the necessity of the knowledge of lithology in hydrology.
9. Define hydrological drought.
10. Give a brief account about the flood warning signals used in major rivers.

Part – B (5 x 16 = 80 marks)

11. Elucidate the different types of rainwater harvesting measures applicable to urban areas, with neat sketches. (16)

12. a) Hydrologic cycle has no beginning or end – Discuss. (16)

(OR)

b) (i) A two hour rain fell in a catchment of 700 ha. The rate of rainfall is tabulated below. The value of Ø index is 3.5 cm/hr. Find out the (a) total value of surface runoff, (b) total rainfall and (c) W – index. (10)

Time duration (minutes)	0 - 40	40 - 60	60 - 80	80 - 100	100 - 120
Rate of rainfall (cm/hr)	2.0	2.5	6.5	12.0	4.0

(ii) Detail the procedure of measuring the evaportranspiration using a Lysimeter. (6)

13. a) Explain a recording type of raingauge with a neat sketch, bringing out the advantages and disadvantages. (16)

(OR)

b) (i) In a 24 hour storm, rainfall of 15 cm was observed over a catchment area of 2 km^2. Initial infiltration capacity was found to be 1.5 cm/hr which became a constant at 0.5 cm/hr after 12 hours. Horton's constant k = 5 hr^{-1}. A pan installed in the catchment indicated 0.5 cm fall in water level during the period of storm after allowing for rainfall. Determine runoff after assuming other losses are negligible. Pan coefficient is taken as 0.7. (10)
(ii) Discuss about the double mass curve analysis. (6)

14. a) Elaborate on the various methods available for runoff estimation. (16)

(OR)

b) Compute the discharge in a river from the data given below. (16)

Distance (m)		0	1	2	3	4	5	6	7	8
Depth (m)		0	0.5	1.2	2.1	2.5	2.0	1.3	0.7	0
Velocity (m/s)	**0.2d**	0	0.4	0.6	0.84	0.9	0.8	0.62	0.54	0
	0.8d	0	0.2	0.36	0.60	0.62	0.58	0.40	0.3	0

15. a) (i) Elaborate on the non-structural methods of flood mitigation. (8)
(ii) Determine the design flood discharge (allowing an increase of one-third) for a bridge site with the following data. Catchment area = $2x10^5$ ha; duration of storm = 8 hrs; storm precipitation = 3 cm; time of concentration = 2 hrs; Gauged discharge for a past flood with average maximum daily rainfall of 18 cm and 3400 cumecs. (8)

(OR)

b) Write short notes on
(i) NDVI analysis of drought assessment (8)
(ii) Drought Prone Area Programme (8)