JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- OCTOBER 2018
B.Tech V Semester

COURSE CODE: 10B11CE513   MAX. MARKS: 25

COURSE NAME: Water Resource Engineering

COURSE CREDITS: 04   MAX. TIME: 1.5 HR

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required and not provided.

Q.1.   **[2+5]**

(a) Explain the "time invariance" and "linear response" assumptions of unit hydrograph theory.

(b) The ordinates of a flood hydrograph resulting from two successive storms each of 4 hour duration producing rainfall depths of 3.6 cm and 4.6 cm respectively are given below. The average infiltration rate in the catchment is 0.4 cm/hr. Determine the resulting direct runoff from the first storm.

Time(hrs)	0	4	8	12	16	20	24	28	32	36	40	44	48
Discharge(m^3/sec)	05	45	125	185	240	275	275	210	160	110	50	05	05

Q.2 During the passage of a flood, the data estimated at two sections 500 m apart are given. The eddy loss coefficients for contraction and expansion are 0.1 and 0.35 respectively. Manning's n=0.022. Find the flood discharge. **[6]**

Section	Water Surface elevation(m)	Area of flow(m^2)	Hydraulic mean depth(m)
Upstream, P	85.233	91.746	2.835
Downstream, R	85.176	84.354	2.917

Q.3 Annual maximum flood data in a river at a station have been processed to estimate the maximum flood for different return periods using Gumbel's method which yielded the maximum floods for 100 and 50 years return period as 450 m^3/sec and 400 m^3/sec respectively. Estimate the flood discharge for return period of 500 years. **[5]**

Q.4 Write short notes on the following:

    (a) Any two snow gauges   **[3]**

    (b) Factors affecting shape of a hydrograph   **[4]**