

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2023

COURSE CODE (CREDITS): 11M1WCE133 (3)

MAX. MARKS: 15

COURSE NAME: BRIDGE ENGINEERING

COURSE INSTRUCTORS: Mr. KAUSHAL KUMAR

MAX. TIME: 1 Hour

*Note: All questions are compulsory. Marks are indicated against each question.*

Q1. A culvert is proposed at a site to pass the peak flow from a 1.5 sq. km composite catchment.

	Subarea C	Subarea D
Area (sq. km)	0.5	1.0
Runoff coefficient	0.4	0.2
Concentration time (min)	30	60

Assume a return period of 5 years and the following IDF function:

$$I = \frac{100T^{0.2}}{(t_r + 20)^{0.7}}$$

where

$I$  = rainfall intensity in mm/h

$T$  = return period in years

$t_r$  = rainfall duration in minutes

Using the following data, compute the value of peak flood flow.

[5 Marks]

Q2. The approximate cost of one superstructure and one sub structure is given blow. Estimate the economic span.

Span (m)	12	18	24
Superstructure cost (Rs.)	44,000	62,000	165,000
Substructure (Rs.)	52,000	58,000	65,000

[5 Marks]

Q3. Answer/describe the following.

- What is the need of a Bridge? Various characteristics of selecting a site for bridge.
- Types of bridges on the basis of span length with neat sketch.
- Types of load are taken into account for impact effect on road bridges? Write the expression for impact factor for IRC Class A loading.

[5 Marks]

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