

Note: (i) Carrying of mobile phone during examinations will be treated as case of unfair means.
 (ii) IRC-6 is allowed also 1 page one sided hand written note is allowed.

Q1. A T-beam bridge (section given in Figure-1) has to be provided across a channel with the following data.

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| <ul style="list-style-type: none"> • Flood discharge: $30 \text{ m}^3/\text{s}$ • Bed width: 12 m • Side slope: 1:1 • Bed level: 50 m • HFL: 51.25 m • Maximum allowable afflux: 1.5 cm | <ul style="list-style-type: none"> • Road: National highway (2-lane) • Footpath: 1 m wide on either side • Loading: IRC Class A • Materials: M40 concrete Fe415 steel • No. of longitudinal girders: 3 |
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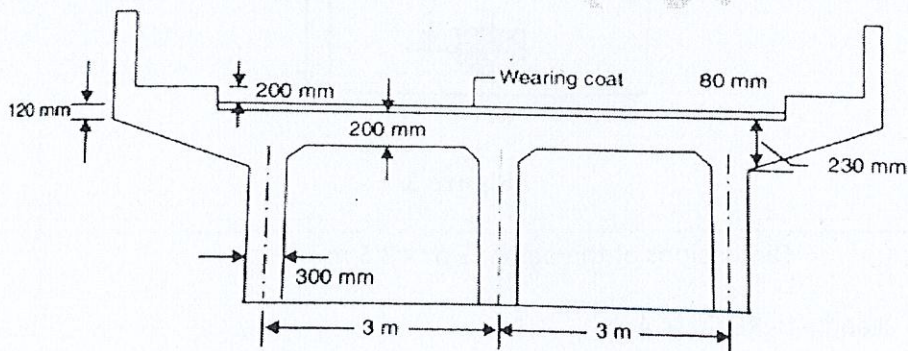


Figure-1

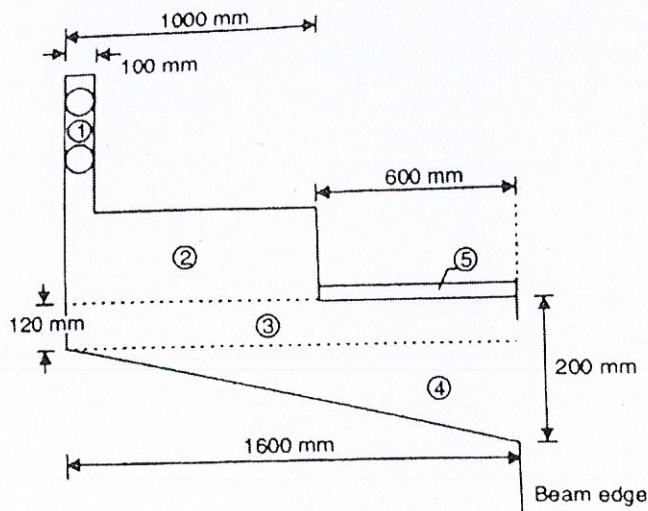


Figure-2

(a) Design the linear waterway, and (b) for the cantilever slab portion of the bridge given in Figure-2, calculate the design moment and design shear only. **CO-1, CO-2 [6 + 9 Marks]**

Roll No.....

- Q2. For the longitudinal girder of T-beam Bridge in Figure-1, calculate the design moment for IRC Class A loading. **CO-2 [10 Marks]**

OR

- Q3. Obtain the values of short-span and long-span bending moments in case of an interior panel of a T-beam road bridge (given in Figure-3 with the following details).

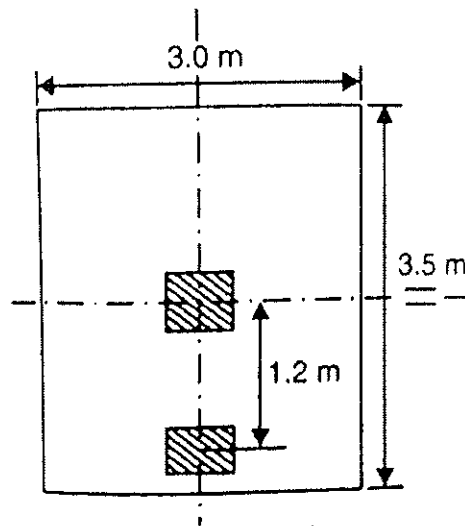


Figure 3

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- Dimensions of the panel: 3 m × 3.5 m
 - Loading: IRC Class A
 - Loading pattern: One wheel (57 kN) at the centre of the panel.
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CO-3 [10 Marks]