

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 TEST -3 EXAMINATION- May 2018
 M.Tech IVth Semester

Roll No.....

COURSE CODE: 11MIWCE133
 COURSE NAME: Bridge Engineering
 COURSE CREDITS: 4

MAX. MARKS:35

MAX. TIME: 2 Hrs

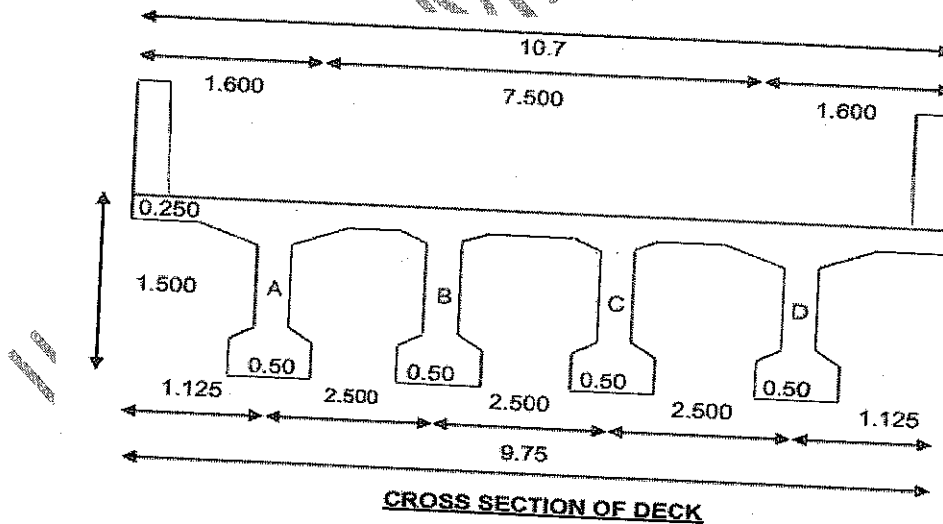
Note: (i) Carrying of mobile phone during examinations will be treated as case of unfair means.
 (ii) IRC-6 and Pigeaud's curves are allowed. Assume necessary Data.

Q1.

CO-1- CO-4 [10 Marks]

- Write the major components of a concrete bridge.
- Why is design discharge important for bridge design?
- What is the condition for the most economical span of a bridge?
- What type of loads are taken into account for impact effect on road bridges? Write the expression for impact factor for IRC Class A loading.
- Why are cross-beams provided in T-beam bridge?
- What are the factors affecting selection of type of prestressing, i.e., pre-tensioning or post-tensioning?
- What is the main advantage of using framed piers over non-framed piers?
- What is the function of bearings in bridges?
- What is expansion bearing? Give its various types.
- List the four classes of quality assurances in maintenance of bridges.

Q2. For the longitudinal girder of T-beam bridge in Figure-1, calculate the design moment for 70 R Tracked Vehicle.
 CO-2, CO-3 [15 Marks]



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| <ul style="list-style-type: none"> Effective Span = 16.000 m Total length of Deck = 8.700 m Carriage way width = 7.500 m Width of Parapet including Kerb = 0.600 m Width of Footpath = 1.000 m | <ul style="list-style-type: none"> Thickness of Footpath = 0.350 m Thickness of Kerb = 0.450 m Thickness of Parapet = 0.200 m Hight of Parapet above Kerb = 0.900 m No of Cross Girder = 5.000 m |
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Roll No.....

<ul style="list-style-type: none"> • Thickness of Slab = 0.250 m • No of Longitudinal Girder = 4.000 m • Hight of Longitudinal Girder = 1.500 m • Spacing of Longitudinal Girder = 2.500 m • Cantiliver Length = 1.125 m • Thickness of Web = 0.250 m 	<ul style="list-style-type: none"> • Spacing of Cross Girder Spacing = 4.000 m • Thickness of Cross Girder = 0.300 m • Hight of Cross Girder = 1.500 m • Density of RCC = 25.000 kN/m³ • Wearing Coat Thickness = 0.080 m • Density of Wearing Coat 22.000 kN/m³
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Q.3. Verify the adequacy of the dimensions of the pier shown in Figure-2. The following details are available.

CO-2 [15 Marks]

<ul style="list-style-type: none"> • Top width of the pier: 1.6 m • Height of the pier upto the springing level: 10 m • C/C of bearings on either side: 1 m • Side batter: 1 in 12 • High flood level: 1 m below the bearing level • Span of the bridge: 16 m • Loading on span: IRC Class AA • Road: Two-lane road with 1 m wide footpath on either side 	<ul style="list-style-type: none"> • Superstructure: Consists of three longitudinal girders of 1.2 m depth with a deck slab of 220 mm depth • Rib width of girders: 300 mm • Material of pier: M15 concrete • Maximum mean velocity of water current: 3 m/s • Pier length: 9.5 m • Dead load from superstructure: 1300 kN • Unit weight of concrete in pier: 24 kN/m³.
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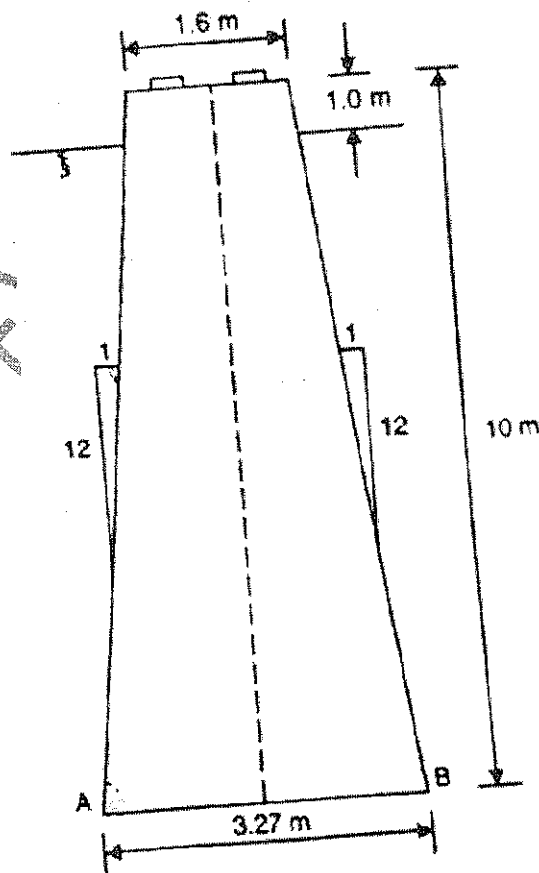


Figure-2