Ref. No.: Ex/CON/PC/B/T/321/2023

B. CONS. ENGG. 3rd YEAR 2nd SEMESTER EXAM.-2023

BRIDGE ENGINEERING

Time : Three hours | Full Marks : 100

(50 Marks for each Part)
Use separate answer script for each Part

PART I (50 Marks)

Answer any Two Questions of the following. Relevant IRC & IS Codes are allowed.
Assume any other relevant data not provided. Draw **Neat sketches** to explain your answer.

1. a) What are the different **classification and selection** of **Bridge types.** 7

   b) What are the Ideal Characteristics for Selection of a **River Bridge** Site? 8

   c) Discuss on Class **70R Wheeled** and **Class A train of vehicles** as per **IRC code.** Comment on the **relevance of these loads** on different spans of the bridge 10

2. Calculate the **Live Load moment** of a Two-lane Culvert due to **70R Wheeled Vehicle** with following data. **25**

   i. Clear span = 10.5 m
   ii. Bearing width = 350 mm
   iii. Thickness of Deck Slab = 360 mm
   iv. Size of kerb = 750 mm X 300 mm
   v. Thickness of Wearing Coat = 75 mm
   vi. Size of Hand Rail = 75 mm X 1000 mm = 1KN/m
   vii. Value of 'α' = 2.90

3. Draw the Cross Section of the Bridge and Calculate the **Design Moment** of the **Cantilever Portion** of the RCC Girder Bridge. **25**

   i. The Effective **Span** of the bridge is **20 m.**
   ii. **Width of Carriageway = 7.5 m;** Size of Kerb = 600 X 300
   iii. Thickness of Deck Slab = 200 mm; Thickness of Wearing Coat = 75 mm
   iv. **No. of Longitudinal girder = 3;** No. of Cross girder = 5
   v. Size of bottom flange of Longitudinal Girder = 600 X 400 mm
   vi. Web thickness of Longitudinal Girder = **250 mm**
   vii. **Centre to centre** distance of Longitudinal Girder = **2750 mm**
   viii. Overall depth of Longitudinal Girder = 2000 mm
   ix. Size of fillets = 150 mm X 150 mm
   x. Thickness of Cross girder = 200 mm
   xi. Overall depth of Cross Girder = 1250 mm

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B. CONS. ENGG. THIRD YEAR 2ND SEMESTER EXAM.-2023

BRIDGE ENGINEERING

Time : Three hours **Full Marks : 100**

Group / Part : PART II

Instructions : Use Separate Answer scripts for each Group
Answer All Questions

No of Questions	Part II (50 Marks)	Marks
Q1	Draw a Sketch of a abutment wall / Supported on Pile foundation, Show different components of it and explain the utility of these different components of bridge?	15
Q2	For large span bridge super structure cable suspension and cable stand bridges are two very popular options, Explain why cable stayed bridge construction methodology is adopted in Kolkata Second Hooghly Bridge construction.	10
Q 3	Write a descriptive note on well foundation design methodology with the help of IRC-4S, 1972 and elastic theory method.	25