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Register Number:…………..…

M.E DEGREE EXAMINATIONS: DEC 2022

(Regulation 2018)

First Semester

STRUCTURAL ENGINEERING

P18SEE0001: Design of Bridges

Use of IS:456-2000, IRC-6, IRC-21 and Pigeaud's charts are allowed

COURSE OUTCOMES

CO1: Calculate loads for different types of Bridges.

CO2: Design short span and long span bridges.

CO3: Design bearings and substructure for bridges.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions: -

PART A (10 x 1 = 10 Marks)

1. ____ is a part of road which connects the road to the abutment of the bridge.   CO1   [K1]

a)	Approach	b)	Afflux
c)	Approach slab	d)	Bearing

2. ____ is a vertical wall projecting from abutment cap to prevent spill of earth materials   CO1   [K1]

a)	Dirt wall	b)	cofferdam
c)	Channel	d)	Cause way

3. The level that generally prevailing in the river during dry weather is called as   CO1   [K1]

a)	Low water level	b)	Ordinary flood level
c)	Highest flood level	d)	Full supply level

4. A slab bridge can be used upto a span ___ m.   CO2   [K2]

a)	10	b)	12
c)	8	d)	14

5. The minimum clearance between road face of kerb and the outer edge of wheel track "C" shall be   CO2   [K2]

a)	1.2 m	b)	1.1 m
c)	1 m	d)	1.3 m

6. ___ culvert is used for the storage of storm water runoff. CO2 [K2]
   a) Box culvert   b) U shape

   c) Tunnel   d) Multicell box

7. ___ bridges reduce the needs of pier, girder and truss. CO2 [K1]
   a) Suspension bridge   b) Arch bridge

   c) Turss bridge   d) Box girder bridge

8. A group of tendons form a CO3 [K1]
   a) Strands   b) Wire

   c) Cable   d) Bars

9. Structure which sunk through ground or water to exclude water during the process of excavation is CO3 [K1]
   a) cofferdam   b) caisson

   c) well   d) pit

10. Which caisson is opened at top and closed at bottom? CO3 [K1]
    a) well   b) pneumatic

    c) cylinder   d) box

PART B (10 x 2 = 20 Marks)

No.	Question	CO	K
11.	List the uses of bridges.	CO1	[K1]
12.	Mention the uses of bridges based on function.	CO1	[K2]
13.	What are the two aspects that to be considered while construction of slab bridges?	CO2	[K2]
14.	Write the applications of box culvert.	CO2	[K2]
15.	Infer the limitation of Courbons theorey in Tee beam bridges.	CO2	[K2]
16.	Pen down the advantages of balanced cantilever bridges.	CO2	[K2]
17.	Outline the advantages of prestressed concrete bridges.	CO3	[K2]
18.	How the nature of concrete steel interface classified.	CO3	[K2]
19.	Why we use bearing in bridges?	CO3	[K1]
20.	Classify the types of foundation that can be used for bridges.	CO3	[K2]

PART C (10 x 5 = 50 Marks)

No.	Question	CO	K
21.	Describe any three types of bridges.	CO1	[K2]
22.	List and write short notes of collection data of the bridge completion.	CO1	[K2]
23.	Outline the steps that to be carry out for the slab bridge design.	CO2	[K2]
24.	Discuss the design loads that can be considered in box culverts.	CO2	[K2]
25.	Write the steps that to be fallowed in designing the balanced cantilever bridge.	CO2	[K2]

26. Mention the stages of loading in the prestressed concrete bridges. CO3 [K2]

27. Relate the types of prestressing using in the structure. CO3 [K2]

28. Elaborate the losses in prestressing concrete. CO3 [K2]

29. Describe the types and advantages of well foundation. CO3 [K2]

30. Justify the suitable materials that can be used for piers CO3 [K2]

Answer any TWO Questions
PART D (2 x 10 = 20 Marks)

31. Discuss in detail about the planning strategies that following in bridge construction. CO1 [K2]

32. Explain the specification, analysis, applications of box girder bridges. CO2 [K2]

33. Design an elastomeric unreinforced neoprene pad bearing to suit the following data:
Vertical load = 250 kN
Horizontal force = 50 kN
Modulus of rigidity of elastomer: 1 N/mm^2
Friction Coefficient: 0.3 CO3 [K3]

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