

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (CE) (Sem.-6)**  
**BRIDGE ENGINEERING**  
Subject Code : PECE-603F-18  
M.Code : 79405  
Date of Examination : 07-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Write briefly :**

- a) Mention various site selection factors for concrete bridge.
- b) List various code used while designing a bridge.
- c) What are the advantages of elastomeric bearing over other types of bearings?
- d) What do you mean by prefabricated construction material?
- e) Differentiate between shallow and deep foundation?
- f) How is contact pressure distributed for a flexible footing?
- g) What is a box girder bridge?
- h) What is incremental launching.
- i) What do you mean by superstructure?
- j) When is expansion joints provided in bridge?

**SECTION-B**

2. What are various types of bearing used for bridge construction?
3. How is a tower constructed? Discuss the construction procedure for a tower.

4. Discuss in detail design procedure for a truss bridge.
5. Differentiate between cable stayed bridge and suspension cable bridge
6. What are the advantages and disadvantages of free cantilever bridge?

### SECTION-C

7. What is a box girder system? Discuss detailing of box girder systems.
8. What do you mean by caissons foundation? What are various types of caissons foundations.
9. Design elastomeric bearing with the help of given data.

$L =$  expandable span length = 40 m

$R_{DL} =$  DL reaction girder = 690 kN

$R_{LL} =$  LL reaction (without impact)/girder = 220 kN

$\theta_s =$  bearing design rotation at service limit state = 0.0025 rad

$\Delta_T =$  maximum temperature change = 21-degree celcius

$\Delta_{PT} =$  girder shortening due to concrete shrinkage = 2 mm

$G =$  shear modulus of elastomer = 0.9 to 1.38 MPa

$\gamma =$  load factor for uniform temperature = 1.2

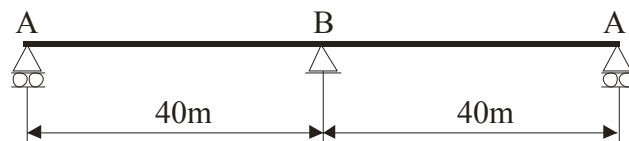
$\Delta F_{TH} =$  constant amplitude fatigue threshold for Category A = 165 MPa

Using 60 durometer reinforced bearing:

$F_y =$  yield strength of steel reinforcement = 350 MPa

Use sliding bearing.

(Assume data, if required)



**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**