Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

M.Tech.(CTM) (E-I) (Sem.–1)

BRIDGE ENGINEERING

Subject Code : CT-510

M.Code : 35223

Time : 3 Hrs. **Max. Marks : 100**

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**
3. **Use of BIS code is allowed.**

Ql. a) Differentiate between submersible and non submersible bridges. (8)

b) For constructing a bridge over a river, calculate the peak discharge by using the following data :

Length of reach = 1250 m, Fall = 0.34 m.

Manning coefficient n = 0.022

	Upstream	Down steam
Flow area m^2 →	3500	3200
Wetted perimeter m →	650	1.21
Velocity head coefficient	1.17	1.21

(12)

Q2. a) How does magnitude of afflux influences the design of a bridge? (10)

b) What is the need of providing vertical clearance above H.F.L.? State typical values of clearance for arch bridges. (10)

Q3. a) Indicate the importance of soil investigations in deciding the location of a bridge?(10)

b) Write importance of scour depth? How is it calculated? (10)

Q4. a) Discuss the factors to be considered while planning and designing form work for a bridge superstructure. (10)

b) Discuss major causes of bridge failures? (10)

Q5. a) What is the purpose of bearings in bridges? (6)

b) Describe the various types of fixed bearings. (7)

c) How would you provide Kerbs for a submersible bridge? (7)

Q6. a) What are the considerations for the selection of erection plant in steel bridge erection? Discuss. (10)

b) Discuss how the construction method affects the total cost of a bridge. (10)

Q7. a) Draw a schematic diagram of a steel truss bridge and indicate various components. Also explain functions of each component. (12)

b) State why cold drawn wire is specified for suspension cable and not heat treated wire of the same strength? (8)

Q8. A well foundation is to be designed for an abutment of 10m ×15m base foundation. The well is founded on sandy soil.

Data : Height of bearing above maximum scour level = 28 m.

Permissible displacement of bearing level = 50 mm.

Typical vertical load including weight of abutment and well (considering buoyancy effect) = 20 kN.

Total lateral load = 400 kN.

Submerged weight of soil = 9.5 kN/m^3

Design the well and compute the stress in steining. (20)

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.