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

Total No. of Questions : 09

B.Voc. (Building Construction and Technology) (Sem.-5)

STRUCTURAL ENGINEERING-I

Subject Code : BVBCT-502-20

M.Code : 92439

Date of Examination : 23-12-22

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) Explain about various tests required to be conducted during inspection of fresh concrete.

b) Discuss curing of concrete.

c) List various errors in concrete construction.

d) What are partial safety factors?

e) What are the various modes of failure which could occur due to combination of shear and bending moment?

f) Briefly write the terms 'Balanced', 'Over Reinforced' and 'Under Reinforced' sections in bending.

g) Distinguish between one way and two way slabs.

h) What do you understand by diagonal tension? In what way shear stress and diagonal tension are related to each other?

i) Define Modulus of Rupture and how is it calculated for concrete.

j) Define development length.

SECTION-B

2. Explain the importance of anchorage of reinforcing bars in flexure and shear.

3. Write down various types of cement with their chemical composition. Also discuss their hydration and setting process.

4. A T beam has flange dimensions 1500 × 120 mm. The width of rib is 250 mm and rib depth is 350 mm. If the beam is reinforced with 1900 mm^2 of steel in tension zone with an effective cover of 40 mm, determine the maximum allowable udl inclusive of selfweight over a simply supported span of 6m. M20 grade concrete and Fe 415 steel is used.

5. Explain the various types of shear failures and shear design of R.C.C beams

6. Design a flight of stair is to be supported by beams on both edges. The effective span of the stair is to be taken by 1.5m. Live load on stair is 3KN/m^2. Use M20 concrete and HYSD steel

SECTION-C

7. Explain the three design philosophies of reinforced concrete structural elements

8. Design a reinforced concrete slab of size 6m × 4m whose one short edge is discontinuous and corners are restrained at supports. The slab has to carry a live load of 3 KN/m^2 and a floor finish of 1 KN/m^2. Use M20 concrete and Fe415. Sketch the details of reinforcements.

9. Describe the various characteristics of aggregates which affect the properties of concrete both in its fresh and hardened state.

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.