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Total No. of Pages : 02

Total No. of Questions : 09

B.Voc. (Building Construction and Technology) (Sem.-4) STRENGTH OF MATERIAL Subject Code : BVBCT-403-20 M.Code : 91639 Date of Examination : 11-07-22

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) Define strain energy
- b) Give the expression for bending stresses when the beam is subjected to pure bending.
- c) What do you understand by the terms 'Column' and 'Strut'.
- d) Differentiate between working stress and ultimate stress.
- e) Define poisson ratio.
- f) Define bending and shear stress.
- g) Discuss the effect of eccentricity on columns.
- h) How materials are classified?
- i) Illustrate Euler's buckling load for column.
- j) Give the relation between load, shear force and bending moment.

SECTION-B

- 2. Write down the important assumptions made in theory of simple bending.
- 3. A simply supported beam ABCD is of 5 m span, such that AB = 2m, BC = lm and CD = 2m. It is loaded with 5 kN/m over CD. Draw shear force and bending moment diagram for the beam.
- 4. Explain the assumptions made in Euler's column theory.
- 5. Two planes AB and BC which are at right angles carry shear stresses of intensity 17.5N/mm², while these planes also carry a tensile stress of 35 N/mm² respectively. Determine the principle planes and principle stresses. Also determine the maximum shear stress and the planes on which it acts.
- 6. What is the significance of statically determinacy of a problem?

SECTION-C

- 7. A beam of length (l+2a) has supports L apart with an overhang 'a' on each side. The beam carries a concentrated load W at each end. Construct shear force and bending moment diagrams.
- 8. a) A simply supported beam with overhang ends carries transverse load as shown below. If W = 20w, what is the overhang length on each side, such that the BM at the middle of the beam is zero? Draw BMD and SFD.



- b) Derive relation between shear force and bending moment at a section.
- 9. Write short notes on the following:
 - a) Hooke's law
 - b) Volumetric strain
 - c) Use of Mohr circle in computation of stress and strains.

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.