

Roll No.

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 :

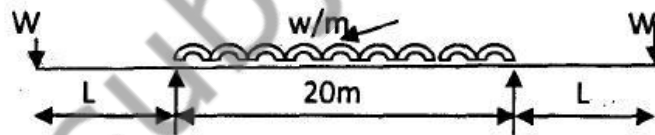
- a) Define strain energy
- b) Give the expression for bending stresses when the beam is subjected to pure bending.
- c) What do you understand by the terms '*Column*' and '*Strut*'.
- d) Differentiate between working stress and ultimate stress.
- e) Define poisson ratio.
- f) Define bending and shear 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 $AB = 2\text{m}$, $BC = 1\text{m}$ and $CD = 2\text{m}$. 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/mm^2 , while these planes also carry a tensile stress of 35 N/mm^2 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.