No. of Printed Pages : 4 220331
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3rd Sem / Automobile, Mechanical Engg.

Subject:- Strength of Materials

Time : 3Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 The unit of Longitudinal stress is (CO-2)

a) N/mm^2 b) N/mm^3

c) N/mm^4 d) N/mm^5

Q.2 Modulus of resilience is the ratio of (CO-3)

a) Resilience to volume

b) Proof resilience to the modulus of elasticity

c) Proof resilience to the strain energy

d) Proof resilience to unit volume of the body

Q.3 The neutral axis of the cross-section a beam is that axis at which the bending stress is (CO-6)

a) Zero b) Minimum

c) Maximum d) Infinity

Q.4 The point of contraflexture occurs in case of (CO-4)

a) cantilever beams

b) simply supported beams

c) over hanging beams

d) all type of beams

Q.5 Unit of torque in S.I. system is (CO-4)

a) kgm b) kgcm

c) Nm d) N/m^2

Q.6 In case of thin walled cylinder the correct ratio of hoop stress so longitudinal stress is (CO-2)

a) 2 b) 1/2

c) 4 d) None of the above

SECTION-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 The neutral axis of the cross-section a beam is that axis at which the bending stress is _____ (CO-6)

Q.8 The property of a material by virtue of which a body returns to its original, shape after removal of the load is called _____ (CO-1)

Q.9 Define moment of inertia. (CO-4)

Q.10 What is the unit of stress? (CO-1)

Q.11 Define stiffness. (CO-5)

Q.12 Full form of U.D.L. (CO-5)

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Explain- (CO-1)

a) Hook'e law b) Poisson's ratio

Q.14 Explain beam. How the beams are classified? (CO-4)

Q.15 A rod 2m long @30mm diameter is subjected to an axial pull of 30KN. If the Young's modulus of material of the rod is $2^* (10)^5$ N/mm^2, determine- (CO-1)

a) Stress b) Strain

Q.16 State theorem of Parallel axis and perpendicular axis. (CO-4)

Q.17 Write any five assumptions made in the theory of simple bending. (CO-6)

Q.18 State the factors on which strength of the column depends. (CO-8)

Q.19 A solid shaft is to transmit a torque of 40KNm. If the shear stress is not to exceed 64N/mm^2, find the minimum diameter of the shaft? (CO-7)

Q.20 Name various types of spring. Explain anyone. (CO-8)

Q.21 Write down the difference between Buckling load & safe load. (CO-3)

Q.22 Explain stress & strain diagram for brittle materials. (CO-5)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Draw SFD and BMD for a cantilever beam of 4m long carries a udl of 2KN/m and a traditional point load of 3 KN at a distance of 3 m from its free end. (CO-5)

Q.24 Drive an expression for torque equation for a solid shaft. (CO-5)

Q.25 A hollow cast iron column 100m in external diameter & 10mm metal thickness is subjected to a compressive load of 40KN. Calculate the stress developed in the material of column if it shortens by 1.44mm in a length of 8 metres. Also calculate the young modulus of elasticity. (CO-1)

(Note : Course outcome/CO is for office use only)