No. of Printed Pages : 4
Roll No. .....

170342

4th Sem / Branch : Auto., Mech.

Subject:- Strength of Materials

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 Hook's law holds good up to
- a) Elastic limit
- b) Plastic limit
- c) Limit of proportionality
- d) None of the above

Q.2 A brittle material has
- a) No elastic zone
- b) No plastic zone
- c) Large plastic zone
- d) None of the above

Q.3 Modulus of resilience is equal to
- a) Resiliece/volume
- b) Proof resilience/area
- c) Resilience/area
- d) Proof resilience/volume

Q.4 The unit of moment of inertia is
- a) Meter
- b) $Meter^2$
- c) $Meter^3$
- d) $Meter^4$

Q.5 The polar moment of inertia of a circular section is about
- a) x-x axis
- b) y-y axis
- c) z-z axis
- d) Neutral axis

Q.6 At the point of contra flexure
- a) B.M. is minimum
- b) B.M. is maximum
- c) B.M. is either zero or change sign.
- d) None of the above

Q.7 The strength of a beam is depends upon
- a) Its section modulus
- b) Permissible bending strength
- c) Both (a) and (b)
- d) None of the above

Q.8 The slenderness ratio is the ratio of
- a) Length of column to least radius of gyration
- b) M.O.I. to area of cross section
- c) Area of cross section to M.O.I.
- d) Least radius of gyration to length of column

Q.9 Shaft are designed on basis of
- a) Rigidity
- b) Strength
- c) Both (a) and (b)
- d) None of the above

Q.10 The spring used to absorb shocks and vibration is
- a) Closed coiled helical spring
- b) Open coil helical spring
- c) Spiral spring
- d) Leaf spring

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define thermal stress.

Q.12 Define shear resilience.

Q.13 Define the radius of gyration.
Q.14 Define section modulus.
Q.15 Write the Euler's formula.
Q.16 What is unit of torque?
Q.17 Define buckling load.
Q.18 Define thin cylinder.
Q.19 Define the sagging in a beam.
Q.20 What do you understand by stiffness of spring?

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define the strain and its types.
Q.22 Define Hook's law and various constants.
Q.23 Define and draw stress-strain curve for mild steel.
Q.24 Drive an expression for maximum stress induced, when load is applied suddenly.
Q.25 What do you understand by uniform strength of a beam? On what factors the strength of beam depends?
Q.26 Define the strut and column. What are difference between strut and column?
Q.27 Define equivalent length. Explain various end conditions of column.
Q.28 What assumptions are made in the Euler's theory?
Q.29 What is meant by strength of a shaft? Write the formula for strength of a solid and hollow shaft.
Q.30 Explain the various functions of spring.
Q.31 What is laminated spring? Write its various advantages over the helical spring.

Q.32 Derive the expression for hoop's and longitudinal stress in a thin seamless cylindrical shell.
Q.33 What is physical significance of moment of inertia?
Q.34 Define the beam and its types.
Q.35 Define shear force and bending moment.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 A steel rod of 40mm diameter and 4m long is subjected to a suddenly compressive load of 100kN. Determine the shortening of the bar and the amount of work done. Take E=210GPa.
Q.37 A cantilever beam of length of 4m carries a uniformly distributed load of 2.5kN/m over a whole span and a point load of 4kN at the free end. Draw shear force and bending moment diagram.
Q.38 Derive the Bending equation.