No. of Printed Pages : 4 120331/031731

Roll No. .....

3rd Sem. / Auto,Mech,Prod.,MT, GE,CNC,Plastic,CAD/CAM

Subject : STRENGTH OF MATERIALS

Time : 3 Hrs. M.M. : 100

SECTION-A

Note: Very Short Answer type questions. Attempt any 15 parts. (15x2=30)

Q.1 a) Define Hooks law.

b) Define Poisson's ratio.

c) Enlist various loading modes.

d) Define point of contra flexture.

e) What is factor of safety?

f) What is strain energy?

g) Define radius of gyration.

h) Write torque equation for circular shaft.

i) What is slenderness ratio?

j) Enlist causes of failure of columns.

k) Explain crippling load.

l) Define proof resilience.

m) What are springs?

n) Define neutral axis.

o) How are Helical srings classified?

p) Write an equation to find out instantaneous stress produced due to impact loading.

q) Differentiate between Cantilever and simply supported beam.

r) Define buckling load.

SECTION-B

Note: Short answer type questions. Attempt any ten parts 10x4=40

Q.2 i) Draw S.F. and B.M. diagrams of a cantilever of length 6m and point load of 5KN is applied at free end.

ii) Differentiate between long column and short column.

iii) Define neutral axis in beam and state from where it passes.

iv) What is laminated spring? State where it is used.

v) Define theorem of perpendicular axis.

vi) Explain volumetric strain and lateral strain.

vii) Write equations for maximum stress induced in body if load is applied gradually.

viii) Explain various types of Beams.

ix) Differentiate between point load and uniformly distributed load.

x) Draw S.F. and B.M. diagrams for cantilever of length L carrying point load W at the free end.

xi) Define point of inflection and where it occurs in over hanging beam?

xii) A rectangular section is of breadth 12.5cm and depth 25cm. Find section modulus?

xiii) Find maximum torque transmitted by solid shaft if its diameter is 150mm and maximum shear stress is 45N/mm^2.

xiv) Enlist various factors effecting strength of column?

xv) Explain various loading modes.

SECTION-C

Note: Long answer type questions. Attempt any three questions. 3x10=30

Q.3 Explain the terms elasticity, elastic limit, limit of proportionality.

Q.4 Find the diameter of the steel wire if given load is 4000N and stress is 95MN/m^2.

Q.5 An axial pull of 50KN is suddenly applied to a steel rod 2m long and 1000mm in cross section , calculate the strain energy that can be stored if E= 200x10^{3}N/mm^2

Q.6 A leaf spring carriers central load of 3000N. Determine the length of spring if leaf spring is made of 10 steel plates 5cm wide and 6mm thick, given bending stress 150N/mm^2.

Q.7 Find the moment of inertia of T section with flange25cmx2.5cm and web 15cmx2.5cm about an axis passing the C.G. of the section and parallel to XX axis.