Roll No. ....

3rd Sem / Automobile Engineering
Subject:- Strength of Material

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1   The unit of strain is- (CO1)
a)   Newton b) N/m^2
c)   N/cm d)   unit less

Q.2   Modulus of resilience is equal to- (CO2)
a)   1/2 *stress* strain
b)   1/2 *stress* strain*volume
c)   1/2 *stress* volume d)   None of above

Q.3   Unit of section modulus is- (CO1)
a)   m b) m^2
c) m^3 d) m^4

Q.4   The point of contraflexture occurs in case of- (CO4)
a)   cantilever beams
b)   simply supported beams
c)   over hanging beams
d)   all type of beams

Q.5   Effect of compressive force is to _____ the length of body. (CO1)
a)   Decrease b)   Increase
c)   same d)   None of above

Q.6   A beam whose one end is fixed & other is free is called- (CO3)

a)   cantilever beam
b)   simply supported beam
c)   over hanging beam
d)   None of above

Q.7   Which of the following shows strain- (CO1)
a)   P/A b)   SI/I
c)   A/P d)   None of above

Q.8   Unit of load is_____ (CO1)
a)   N b)   Nm
c) N/m^2 d)   None of above

Q.9   _____Are the elastic bodies which absorb energy due to resistence. (CO2)
a)   springs b)   plastic bodies
c)   over hanging beam d)   None of above

Q.10 Unit of torque in S.I system is- (CO4)
a)   kgm b)   kgcm
c)   Nm d) N/m^2

SECTION-B

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

Q.11 Define strain. (CO1)
Q.12 Define proof stress. (CO1)
Q.13 Explain factor of safety. (CO2)
Q.14 What is shear load. (CO1)
Q.15 What is creep. (CO3)
Q.16 What do you mean by young's modulus of elasticity? (CO1)

Q.17 Define moment of Inertia? (CO4)
Q.18 Define strut. (CO5)
Q.19 What is the unit of stress? (CO1)

Q.20 Explain Ductility. (CO1)

SECTION-C

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

Q.21 Explain temperature stresses. (CO1)

Q.22 Draw the SFD & SMD diagrams for a simply supported beam carrying a point load at the mid plan. (CO3)

Q.23 Explain assumptions made in theory of simple bending. (CO5)

Q.24 Calculate the strain energy in a bar which is 8 m long & 60mm in diameter when it is subjected to a tensile load of 200 KN. Take Young's modulus of elasticity = 250 Gpa. (CO2)

Q.25 Explain - (CO4)
a) radius of gyration   b) section modulus

Q.26 Explain Euler's theory for long columns. (CO6)

Q.27 A Closed coil helical spring carries a load of 200N & a mean coil diameter is 10 times the wire diameter. Calculate the wire diameter, if the maximum stress is 70 N/mm2. (CO6)

Q.28 Derive an expression for extension of a uniform bar due to tensile load. (CO1)

Q.29 Explain beam. How the beams are classified? (CO6)

Q.30 Define springs. Also explain different types of springs in brief. (CO5)

Q.31 A rod 2m long @ 30mm diameter is subjected to an axial pull of 30 KN. If the young's modulus of material of the rod is 2*(10)5 N/mm2, determine- (CO1)

a) stress   b) strain
c) elongation of the rod

Q.32 Derive an expression for strain energy stored due to gradually applied load. (CO2)

Q.33 Write down the difference between Buckling load & safe load. (CO3)

Q.34 Explain- (CO1)
a) yield point   b) modulus of rigidity

Q.35 Explain- (CO1)
a) Types of stresses
b) Different types of strains

SECTION-D

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

Q.36 Explain SFD & BMD diagrams of simply supported beam carrying a uniformly distributed load over the whole spam. (CO3)

Q.37 A hollow cast iron column 100m in external diameter & 10mm metal thickness is subjected to a compressive load of 40 KN. Calculate the stress developed in the material of column if it shortens by 1.44 mm in a length of 8 metres. Also calculate the young modulus of elasticity. (CO1)

Q.38 Drive an expression for torque equation for a solid shaft. (Co5)

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