3rd Sem / Branch : Civil
Sub.: Structural Mechanics

Time : 3Hrs.   M.M. : 60

SECTION-A

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

Q.1   Basic of perfect frame is   (CO3)

a)   Hexagon   b)   Pentagon

c)   Square   d)   Triangle

Q.2   If n > (2j - 3), then the frame is a   (CO3)

a)   Perfect frame   b)   Deficient

c)   Redundant frame   d)   None of the above

Q.3   A column fails due to direct stress is called   (CO5)

a)   Short column   b)   Long column

c)   Medium column   d)   Composite column

Q.4   Rankine formula holds good for   (CO5)

a)   Short column   b)   Long column

c)   Medium column   d)   Composite column

Q.5   The rate of change of bending moments is equal to _____.   (CO4)

a)   Shear force   b)   Slope

c)   Deflection   d)   None of the above

Q.6   Shear stress of section in a beam various along its _____.   (CO4)

a)   Depth   b)   Width

c)   Perimeter   d)   Remains constant

SECTION-B

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

Q.7   For long column buckling load is _____ crushing load.   (CO6)

Q.8   A material which is drawn in to wires without rupture is called_____.   (CO1)

Q.9   S.I. Unit of stress is _____.   (CO1)

Q.10 Ratio of lateral strain to longitudinal strain is _____.   (CO2)

Q.11 In a beam, maximum BM a occurs at a point of _____ S.F.   (CO4)

Q.12 The negative bending moment is called_____ moment. (CO4)

SECTION-C

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

Q.13 Discuss the concept of perfect redundant and deficient frame. (CO3)

Q.14 State the relationship between maximum and average shear stress for circular section. (CO6)

Q.15 State theorem of parallel axis & define point of contraflexure. (CO5)

Q.16 A circular steel bar of 20mm diameter carries a tensile load of 30 KN. Find tensile tress in a bar and the elongation in the length of 300 mm if young modulus of elasticity "E" = 2×10^5 N/mm^2. (CO2)

Q.17 What is section modulus of rectangular section & circular section. (CO5)

Q.18 Write the condition for stability of the dam. (CO3)

Q.19 Draw Shear force and bending moment diagrams of cantilever being carrying a point load at free end. (CO4)

Q.20 Differentiate between load and stress. (CO2)

Q.21 Write the expression for slope and deflection in case of simply supported beam with central point load. (CO4)

Q.22 Write the Rankine formula relation to column. (CO5)

SECTION-D

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

Q.23 A cantilever beam of length 6mtr. Carries load of 25 KN at the free end. The width and depth of beam are 200mm and 300 mm respectively. Calculate maximum slope and deflection in a beam when young modulus of elasticity "E" = 2×10^5 N/mm^2. (Co4)

Q.24 Using Euler formula calculate the crippling stress for a series of struts having selenderness ratio of 40, 80, 120 under following condition. (CO6)

a) Both end hinged   b) Both end fixed

Q.25 What are the assumptions are made in the theory of simple bending. (CO6)