Total No. of Questions : 8]

SEAT No. :

**P1332**

[Total No. of Pages : 3

# [5157] -2002
## First Year B. Architecture (End Semester)
## THEORY OF STRUCTURES - II
## (2015 Pattern)

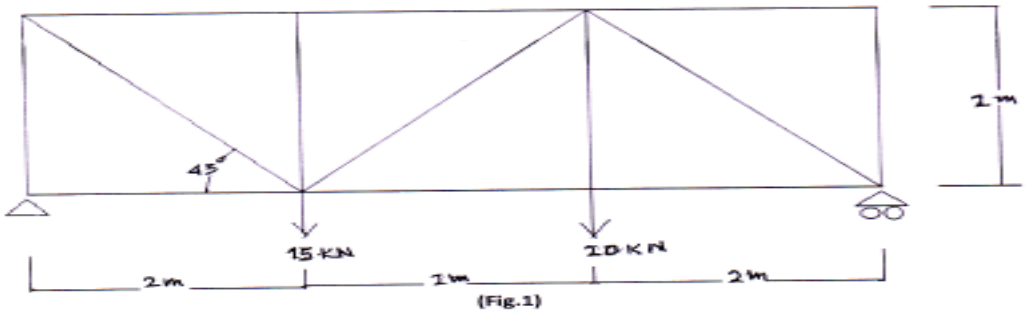
*Time : 3 Hours]* *[Maximum Marks : 70*

***Instructions to the candidates:***

1) *Q.1 and Q.5 are compulsory. Solve any two from Q2/3/4 from Section - I and any two from Q.6/7/8 from Section - II*
2) *Use of scientific calculator is allowed.*
3) *Figures to the right indicates full marks.*
4) *Assume suitable data if any.*
5) *Use separate answer booklet to write Section-I and Section - II.*

## SECTION - I

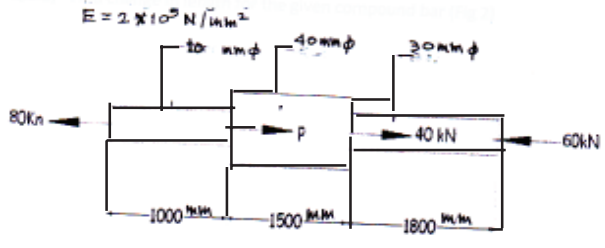
***Q1)*** Analyse the given truss and tabulate forces with their nature in the member. Use method of joint/graphical/section. (Fig1) **[15]**



(Fig.1)

Solve any two from the following.

***Q2)*** a) Find change in length for the given compound bar (Fig 2) **[7]**



(Fig.2)

b) State Hook's Law **[3]**

***P.T.O***

***Q3)*** a) A beam of cross section 300×500 mm simply supported carries a point load of 3kN/m over entire span of 5m. Calculate bending stresses at tension and compression extreme fibres. Also find stress at a distance of 75mm from top and 100mm from bottom and draw bending stress distribution diagram. **[7]**

b) Explain types of stresses. **[3]**

***Q4)*** Define any five: **[10]**

a) Poisson's Ratio

b) Stress

c) Strain

d) Modulus of elasticity

e) Bulk Modulus

f) Shear Modulus

## SECTION - II

***Q5)*** a) A chimney of 15 m height has inside cross sectional dimension 1.5m×1.5m surrounded by a brick masonry of 0.6 m on all four sides, density of brick masonry 19kN/$m^3$.
It is subjected to a wind pressure of 1.6kN/$m^2$. Calculate stresses at the four corners of the chimney. **[12]**

b) Define neutral axis with suitable sketch. **[3]**

***Q6)*** a) Find slope and deflection for a simply supported beam with a point load of 5kN at a distance of 1m from left hand support and a point load of 10kN at a span of 3m from left hand support if entire span is 5m. Take EI = $10^{14}$ $Nmm^2$. **[8]**

b) Draw shear stress distribution diagram for L-section. **[2]**

***Q7)*** a) A rectangular beam section with dimension 250mm×300mm having span of 6m. It carries a UDL of 5kN/m over entire span. Find shear stresses at the necessary points and draw shear stress distribution diagram. **[7]**

b) Write any three assumptions in theory of simple bending. **[3]**

***Q8)*** Attempt any five: **[10]**

a) Write Flexural formula

b) Shear stress distribution diagram for circle

c) Bending stress distribution diagram for I-section

d) Explain perfect frame

e) Define eccentricity

f) Concept of middle third rule

▲ ▲ ▲