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

030255/0241

5th Sem. / Arch Asstt.

Subject : Structural System And Design

Time : 3 Hrs. M.M. : 100

SECTION-A

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

Q.1 Define/ Explain the following terms:-

a) Reinforcement
b) Deformed bars
c) Modular ratio
d) Lever arm
e) Critical neutral axis
f) Diagonal Tension
g) Shear reinforcement
h) Bond stress
i) Doubly reinforced beam
j) Distribution steel
k) One way slab
l) Effective length of column

Q.4 Calculate the strength of 8mm fillet weld, of 10mm effective length when the permissible shear stress in the weld is 108N/mm^2

Q.5 A laterally restrained beam ISMB 400 @604.3N/m is simply supported over an effective span of 8m. Find the sale uniformly distributed load which the beam can carry. Take permissible bending stress as 165N/mm^2 and modulus of section of the beam is 1022.9x10^{3}mm^3

Q.6 A Reinforced concrete column 5m long (effective) and 500 mm in diameter is reinforced with 6 bars of 25 mm diameters. Find the safe load the column can carry. Use M-20 grade of concrete and fe 415 steel.

Q.7 An R.C.C beam 300 mm wide and 500 mm effective depth is reinforced with 4 bars of 16 mm diameter find the moment of resistance if the stresses in steel and concrete are not to exceed 230 N/mm^2 and 7 N/mm^2 respectively

m) Transverse reinforcement

n) Pitch of rivet

o) Butt joint

p) Rivet value

q) Size of weld

r) Roof truss.

SECTION-B

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

Q.2 i) Explain i) Size of weld ii) Throat thickness for fillet weld.

ii) How the strength of butt weld is determined.

iii) Differentiate between lap and butt joint.

iv) Explain Gauge of rivets and diagonal pitch.

v) Differentiate between air supported and air inflated structure.

vi) What are column bases?

vii) Explain buckling and effective length for a steel column.

viii) Distinguish between short and long column as per BIS:800.

ix) Enlist the assumptions made in the theory of simple bending.

x) Why steel is provided in R.C.C structures?

xi) What do you understand by balanced section?

xii) What is the function of transverse reinforcement in a column.

xiii) Explain the difference between one way slab and two way slab.

xiv) What is the necessity of providing shear reinforcement.

xv) What is the purpose of providing longitudinal reinforcement in R.C.C. column.

SECTION-C

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

Q.3 Calculate the value of a 20mm diameter power driven field rivet in a double cover butt joint. The thickness of main plate is 16mm and that of cover plates 8mm each.

What will be the effect on the strength of the rivet if the thickness of cover plate is increased to 9mm each.

Assume 2_{xf}=90N/mm^2, y_{pf}=270N/mm^2