Q.4 Find the moment of resistance of a R.C.C beam 350mm x 550mm (effective) reinforced with 3 bars of 20mm diameter. The permissible stresses in steel and concrete are 230N/mm^2 and7N/mm^2 respectively. Take m= 13.33.

Q.5 A short column 500mm x 500mm is reinforced with 4-25mm diameter bars. Find the ultimate load carrying capacity of the column if the minimum eccentricity is less than 0.05 times the lateral dimensions. The material used are M20 grade concrete and HYSD Fe 415 grade reinforcement.

Q.6 An R.C.C beam 250mm x 500mm (effective carries a U.D.L of 100 KN/m over a clear span of 5m. The beam is reinforced with 1.5 % steel on tension side.

Calculate the nominal shear stress and shear strength of concrete. Also find whether shear reinforcement is required for this beam. Use M20 grade concrete.

Q.7 Write the design steps for a simply supported R.C.C beam.

No. of Printed Pages : 4
Roll No. ....565.....

120745

4th Sem. / Civil Engg.

Subject : R.C.C Design

Time : 3 Hrs. M.M. : 100

SECTION-A

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

Q.1 a) Define reinforced cement concrete.

b) Explain M-20.

c) Explain H.Y.S.D bars.

d) Define a beam.

e) Define neutral axis.

f) Define moment of resistance.

g) Define economical section of beam.

h) Define development length.

i) Define nominal cover to reinforcement.

j) Define modular ratio.

k) Define singly reinforced beam.

l) Define one way slab.

m) Define effective length of a column.

n) Define prestressing.

o) Define T-beam.

p) Define nominal shear stress.

q) What is the maximum % of tensile reinforcement?

r) Define pitch of lateral ties.

SECTION-B

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

Q.2 i) Write the assumptions made in the theory of simple bending for R.C.C. beams.

ii) Write the properties of neutral axis.

iii) Differentiate between under-reinforced and overreinforced beams.

iv) Write the purpose of providing vertical stirrups in R.C.C. beams. Write the formula for spacing of vertical stirrups.

v) Write the criteria for maximum and minimum tensile reinforcement in R.C.C beams.

vi) Why nominal cover to reinforcement is provided.

vii) Differentiate between one way slab and two way slab.

viii) Why distribution reinforcement is provided in one way slabs?

ix) Write the code specifications regarding minimum reinforcement in slabs.

x) What is the difference between short column and long column?

xi) Write the functions of longitudinal reinforcement in a column.

xii) Write the code specifications regarding helical reinforcement.

xiii) Which types of steel reinforcement is provided in a column?

xiv) Write the different types of losses in prestress.

xv) What are the advantages of R.C.C.

SECTION-C

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

Q.3 Find the design constants and percentage of steel for a balanced section of a singly reinforced R.C.C beam using M20 concrete and Fe 415 steel.