DESIGN OF CONCRETE STRUCTURES

UNIT – I

1) Write a note on requirements of good concrete.

2) What are the various types of cement

3) What precautions should be taken while storing cement for a long time?

4) What do you mean by specific surface of a sample of cement

5) What do you mean by consistency of a cement paste

6) Describe the Vicat apparatus

7) How do you determine the initial and final setting times of cement

8) How are aggregate classified

9) What do you mean by fineness modulus?

10) What do you mean by grade of concrete? What are the grades recommended by the I.S.code?

11) Describe the slump test for concrete. What are the slump requirements for various situations?

12) What do you mean by equivalent concrete area of a reinforced concrete member?

13) What are the basic assumptions in the analysis of reinforced concrete members?

14) A 300mm*300mm R.C. member reinforced with 2032mm square of steel supports an axial compression load of 750kn.calculate the stresses in concrete and steel. Take m=18

15) A 400mm*400mm R.C. member has to support an axial compressive load of 425kn.if the stress in concrete is not to exceed 4N/mm square. Calculate the area of steel required. Take m=18

16) Describe about compacting factor test.

17) Describe about workability of concrete.

18) Describe about buckling of sand.

19) The cross section of a singly reinforced concrete beam is 300mm wide and 500mm deep to the centre of the tension reinforcement which consists of four bars of 16mm diameter. if the stresses in concrete and steel are not to exceed $7N/mm^2$and $140N/ mm^2$ respectively. Determine the moment of resistance of the beam. Take m=13.33

20)Find the percentage of tensile reinforcement necessary for a singly reinforced balanced rectangular section if the permissible stresses in concrete and steel are c and t $Newton/mm^2$respectively and the modular ratio is m.

UNIT –II

1)A doubly reinforced rectangular beam is 300mm wide and 500mm deep to the centre of tension steel.it is reinforced with four bars of 18mm diameter as compressive steel at an effective cover of 40mm and with four bars of 20mm diameter as tensile steel.if the stresses in concrete and steel are not to the exceed $7n/mm^2$ and $230n/mm^2$respectively,find the moment of resistance of the section.Take m=13.33 adopt revised elastic theory

2) A doubly reinforced rectangular beam is 300mm wide and 500mm deep to the centre of tension steel.it is reinforced with four bars of 20mm diameter as compressive steel at an effective cover of 40mm and with four bars of 25mm diameter as tensile steel.if the stresses in concrete and steel are not to the exceed $7n/mm^2$ and $230n/mm^2$respectively,find the moment of resistance of the section.Take m=13.33 adopt revised elastic theory

3)A reinforced concrete section is subjected to a bending moment of 150KNm which may be positive or negative.if the permissible stresses in concrete and steel are 7N/mm^2 and 230N/mm^2 and m=13.33 .design the section

4) What do you mean by equivalent concrete area of a reinforced concrete member?

5) What are the basic assumptions in the analysis of reinforced concrete members?

6) A 300mm*300mm R.C. member reinforced with 2032mm square of steel supports an axial compression load of 750kn.calculate the stresses in concrete and steel. Take m=18

7) A doubly reinforced rectangular beam is 250mm wide and 550mm deep to the centre of tension steel.it is reinforced with four bars of 16mm diameter as compressive steel at an effective cover of 40mm and with four bars of 20mm diameter as tensile steel.if the stresses in concrete and steel are not to the exceed 7n/mm^2 and 230n/mm^2respectively,find the moment of resistance of the section.Take m=13.33 adopt revised elastic theory

8)A singly reinforced beam 250mm wide and 380mm deep to the centre of reinforcement is reinforced with 3 bars of 18mm diameter.Determine the depth of netural axis and the maximum stress in concrete when the stress in steel is 150N/mm^2 .Take m=13.33

9)Find the permissible of tensile reinforcement necessary for a singly reinforced balanced rectangular section if the permissible stresses in concrete and steel are c and t Newton/mm^2 respectively and the modular ratio is m.

10)Describe the analysis of a doubly reinforced section-conventional elastic theory

11)What are the effect of reinforcement in concrete

12)Describe about over reinforced section

13)Design a singly reinforced beam section subjected to a maximum bending moment of 55.35knm.The width of the beam may be made two third the effective depth.Use M20 anf Fe415 steel.

14) A singly reinforced beam 300mm wide and 450mm deep to the centre of reinforcement is reinforced with 4 bars of 16mm diameter.Determine the depth of netural axis and the maximum stress in concrete when the stress in steel is 150N/mm^2 .Take m=13.33

15) The cross section of a singly reinforced concrete beam is 300mm wide and 500mm deep to the centre of the tension reinforcement which consists of four bars of 16mm diameter. if the stresses in concrete and steel are not to exceed 7N/$mm^2$and 140N/ mm^2 respectively. Determine the moment of resistance of the beam. Take m=13.33

16)Find the percentage of tensile reinforcement necessary for a singly reinforced balanced rectangular section if the permissible stresses in concrete and steel are c and t Newton/mm^2respectively and the modular ratio is m.

17)Fine the moment of resistance of the beam section ,safe stresses in concrete and steel are 7N/mm^2 and 230N/mm^2 Take m=13.33

18)The beam section is subjected to a bending moment of 150kNm.Determine the maximum compressive stress in concrete and the tensile stress in steel .Take m=13.33

19)What are the properties of balanced sections for various grades of concrete with various types of steel.

20)What are the types of bars used in R.C.C

UNIT –III

1)Describe about shear distribution in a beam of rectangular section

2)Describe about shear stresses in homogeneous sections

3)What are the design processes if vertical striuuups-conventional method

4)Abeam 200mm wide ,500mm effective depth and 6 metres span supports a total load of 190,500 Newtons including its weight.Find the maximum shear stress and determine the spacing of 10mm stirrups by conventional method,Allowable shear stress is 0.50N/mm^2

5)Describe about lattice girder effect(Truss theory)

6) What is the revised theory recommended by the I.S.CODE?

7) A reinforced concrete section is subjected to a bending moment of 150KNm which may be positive or negative. if the permissible stresses in concrete and steel are 7N/mm^2 and 230N/mm^2 and m=13.33 .design the section

8) What are the recommendations development lengths?

9) Describe the necessity of bending reinforcement

10) Describe about Bond (Detailed examples with limit state design method)

11)A beam 300mm wide and 500mm effective deep of 5m span supports a total load of 20000N including its weight. Determine the maximum shear stress in concrete and the spacing of 10mm diameter stirrups by conventional method .Allowable shear stress is 0.50 N/mm^2 .Take c=7N/mm^2 .t=230N/mm^2 ,a=0.90d.

12) What do you mean by equivalent concrete area of a reinforced concrete member?

13) What are the basic assumptions in the analysis of reinforced concrete members?

14) A 300mm*300mm R.C. member reinforced with 2032mm square of steel supports an axial compression load of 750kn.calculate the stresses in concrete and steel. Take m=18

15) Describe about shear distribution in a beam of rectangular section.

16) What are the concept of Equivalent Shear and Moments?

17) A reinforced rectangular beam of span 5m is 300mm wide and 550mm deep to the centre of the tensile reinforcement which consists of four bars of 22mm diameter .The beam carries a load of 20kn/m inclusive of its weight. Design the shear reinforcement. Use M20 concrete and Fe415 steel.

18) The cross section of a singly reinforced concrete beam is 300mm wide and 500mm deep to the centre of the tension reinforcement which consists of four bars of 16mm diameter. if the stresses in concrete and steel are not to exceed 7N/$mm^2$and 140N/ mm^2 respectively. Determine the moment of resistance of the beam. Take m=13.33

19) What do you mean by equivalent concrete area of a reinforced concrete member?

20) What are the basic assumptions in the analysis of reinforced concrete members?

UNIT IV

1)Discuss about reinforcement of a slab.

2)Discuss about loads on slabs.

3)What are the steps to be followed in the design of a one way slab.

4)Design a simply supported slab supported on masonary walls to the following requirements

a)Clear span=3m

b)Live load=4000N/m^2

c)Use M20 concrete and Fe 415 steel

5)Discuss about slab carrying concentrated load.

6)Discuss about two way slabs(slabs spanning in two directions)

7)Discuss about Rankine-Grashoff Theory.

8)Discuss about Two way slabs with corners held down (Marcus correction)

9)Analysis of two way slabs by I.S.CODE

10)Design a slab over a room 4m*6m as per I.S.code.The edges of the slab are simply supported and the corners are not held down.The live load on the slab is 3000N/m^2.The slab has a bearing of 150mm on the supporting walls.Use M20 concrete and Fe 415 steel.

11) Design a simply supported slab supported on masonary walls to the following requirements

a)Clear span=2.5m

b)Live load=3000N/m^2

c)Use M20 concrete and Fe 415 steel

12)Discuss about disposition of reinforcement.

13)Design a 4m*6m interior panel of a two way continuous slab for a live load of 3000N/m^2 .Use M20 concrete and Fe 415 steel.

14)Discuss about Flat slabs and what are the advantages of flat slab construction.

15)Discuss about Theory of a flat slab.

16)Discuss about bending moment of a flat slab

17)Discuss about Reinforcement in a flat slab.

18)Design an interior panel of a flat slab for a live load of 4000N/m^2.The slab is provided with a floor finish weighing 1000 N/m^2.The panels are 6m*6m.Drops shall be provided .Use M20 concrete and Fe415 steel.

19) What do you mean by equivalent concrete area of a reinforced concrete member?

20) What are the basic assumptions in the analysis of reinforced concrete members?

UNIT V

1)Discuss about Transverse reinforcement.

2)What are recommendation regarding longitudinal reinforcement.

3)Discuss about Axially loaded short columns.

4)A short R.C.C columns 400mm*400mm is provide with 8 bars of 16mm diameter.If the effective length of the column is 2.25m.find the ultimate load for the column.Use M20 concrete and Fe 415 steel.

5)Find the area of steel required for a short reinforced concrete column 400mm*425mm to carry an axial load of 1195kn.Use M20 concrete and Fe 415 steel.

6)Analysis and design of axially loaded columns by the use of charts.

7)Determine the safe axial load for a short column 450mmm in diameter ,Reinforced with 6 bars of 25mm diameter.it is provided with 8mm diameter helical reinforcement at a high of 45mm.Use M20 concrete and Fe 415 steel

8)Discuss about combined axial load and uniaxial bending .

9)Areinforced concrete column section is 250mm*400mm is provided with reinforcement as given.Takingx_u =550mm,find p_u and M_U .Use M15 concrete and Fe415 steel.

10)Discuss about Axial load and Biaxial Bending.

11)Design a short columns subjected to biaxial bending to the following particulars

a)Size of the column=400mm*400mm

b)Factored load=1200kn

c)Factored moment=85kn

d)Use M20 concrete and Fe415 steel

12) Describe about Bond (Detailed examples with limit state design method)

13) What do you mean by equivalent concrete area of a reinforced concrete member?

14) What are the basic assumptions in the analysis of reinforced concrete members?

15) What are the properties of balanced sections for various grades of concrete with various types of steel.

16)What are the types of bars used in R.C.C

17) Describe the analysis of a doubly reinforced section-conventional elastic theory

18)What are the effect of reinforcement in concrete

19)Describe about over reinforced section

20) Determine the safe axial load for a short column 350mmm in diameter ,Reinforced with 8 bars of 20mm diameter.it is provided with 8mm diameter helical reinforcement at a high of 45mm.Use M20 concrete and Fe 415 steel