QUESTION BANK
S7 CIVIL ENGINEERING

QUESTION BANK
CE 409-QUANTITY SURVEY AND ESTIMATION- S7 CE

MODULE –I

All the question contains 10 marks each

1. List down various types of estimates

2. What is meant by specification, explain about general specification of first class building?

3. Briefly describe about Detailed specification of earth work excavation?

4. Give the detailed specification of plastering of wall

5. Write short notes on analysis of rates and data book

6. Give the detailed specification of plastering of wall with CM 1:3 mix.

7. Give the detailed specification of brick work

8. What is the deference between preliminary estimate and detailed estimate ?

9. Write short notes on importance of specification

10. Work out the specification for the following items

   a. Earth work for road in embankment

   b. Painting of three coats

MODULE -II

1. Work out unit rate for the following work   10 marks

Material	Quantity	Rate
Broken stone	0.90 cu.m	450/cu.m
Sand	0.45 cu.m	500/cu m
Cement	330 kg	3300/ton
Mason	0.20	450/no
Men	4.50	350/no

2. Calculate the quantities of materials required for the
   Work in cement concrete 1:3:6 for 2010 m^3.   10 marks

3. Work out unit rate for the following work   10 marks

RR masonry in cm 1:3:10 cum for basement

Material	Quantity	Rate
Rubble	10 cu.m	200/cu.m
Sand	3 cu.m	500/cu m
Cement	15 bags	450/ton
Mason	3.5 men	750/men
Men	8	550/no

4. Work out unit rate for RR masonry for foundation in cement & motor 1:6

For 1 cum, rubble $1m^3$@ 600/ m^3, river sand 0.3 m^3@1200/ m^3, cement 72 kg@ 5000/ton, mason 0.7/ m^3@ 450/person, man 0.35 m^3 250/no.   10 marks

5. Work out unit rate for PCC 1:4:8 using broken stone.

For 1 cum, broken stone $1m^3$@ 1100/ m^3, river sand 0.48 m^3@1200/ m^3, cement 172 kg@ 5000/ton, mason 0.7/ m^3@ 450/person, man 0.35 m^3 250/no.   10 marks
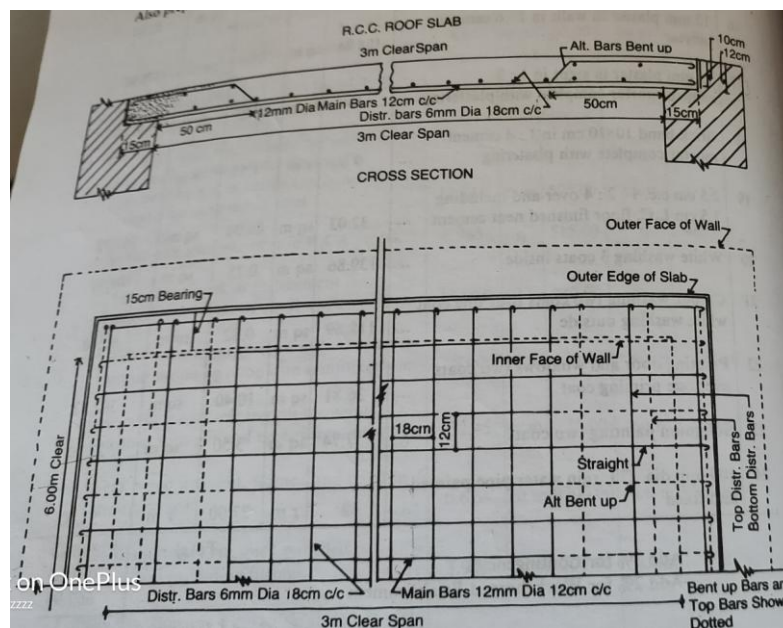
MODULE –III

1. Estimate the quantities of the items of the following items of a residential building

   a. Earth work excavation in foundation

   b. First class brick work in foundation

   c. Lime concrete in foundation

   d. Brick work in super structure

   e. Dam proof course

   f. Plastering in walls   20 marks
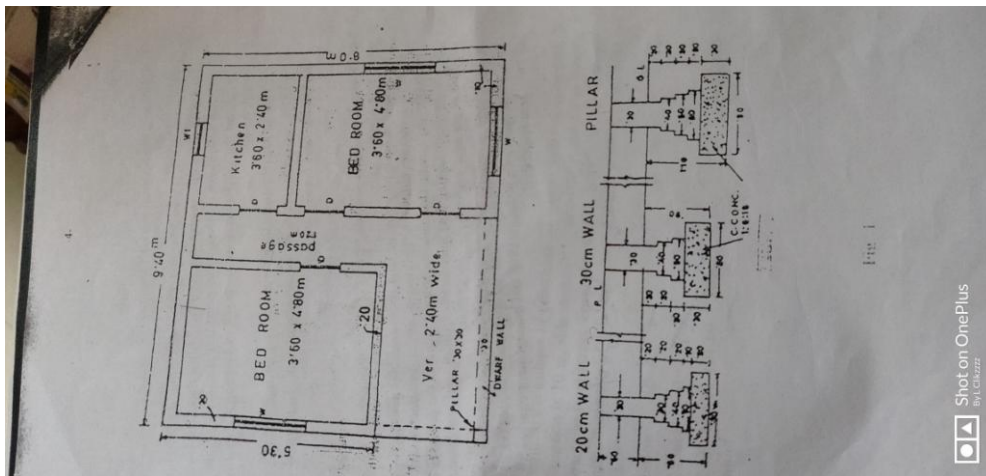
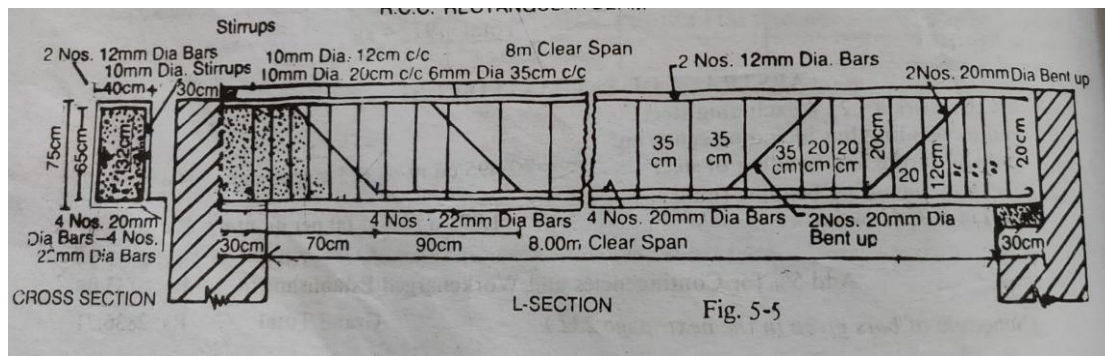2. Work out the quantites of steel in a RCC roof slab shown in figure. Also prepare bar bending schedule   20 marks
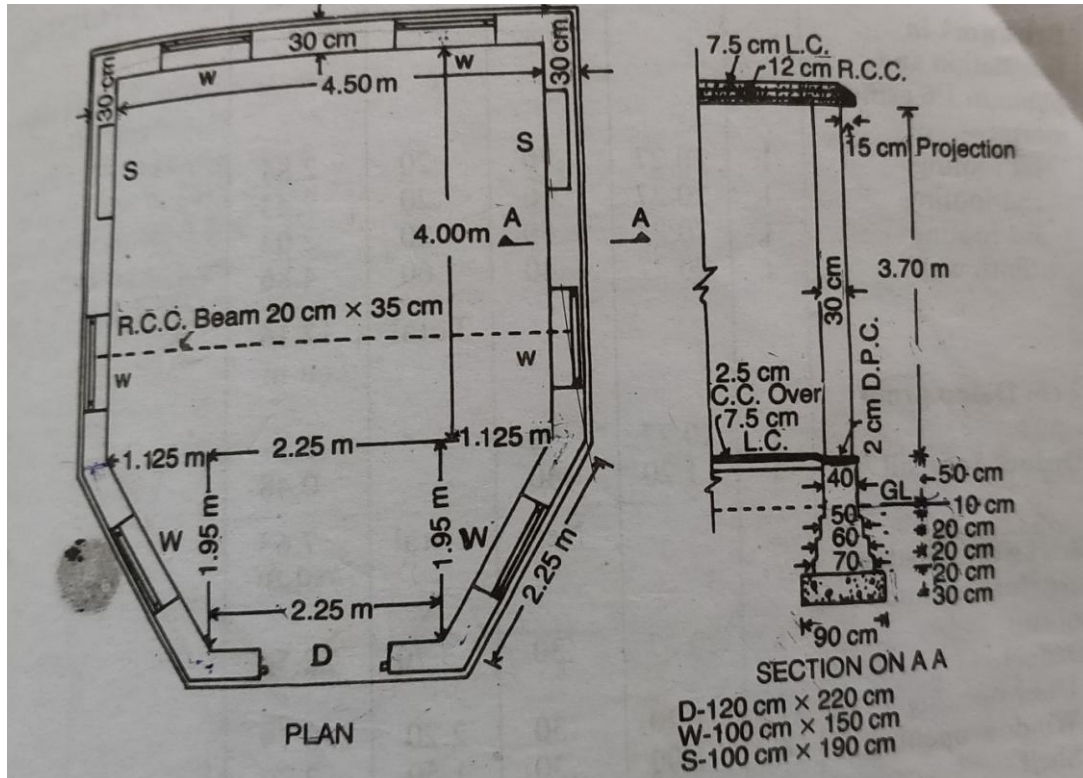
3. Prepare the detailed estimate of RCC beam of 8m clear span and 75x40 cm in section from the given figure. Also prepare a schedule of rates   20 marks
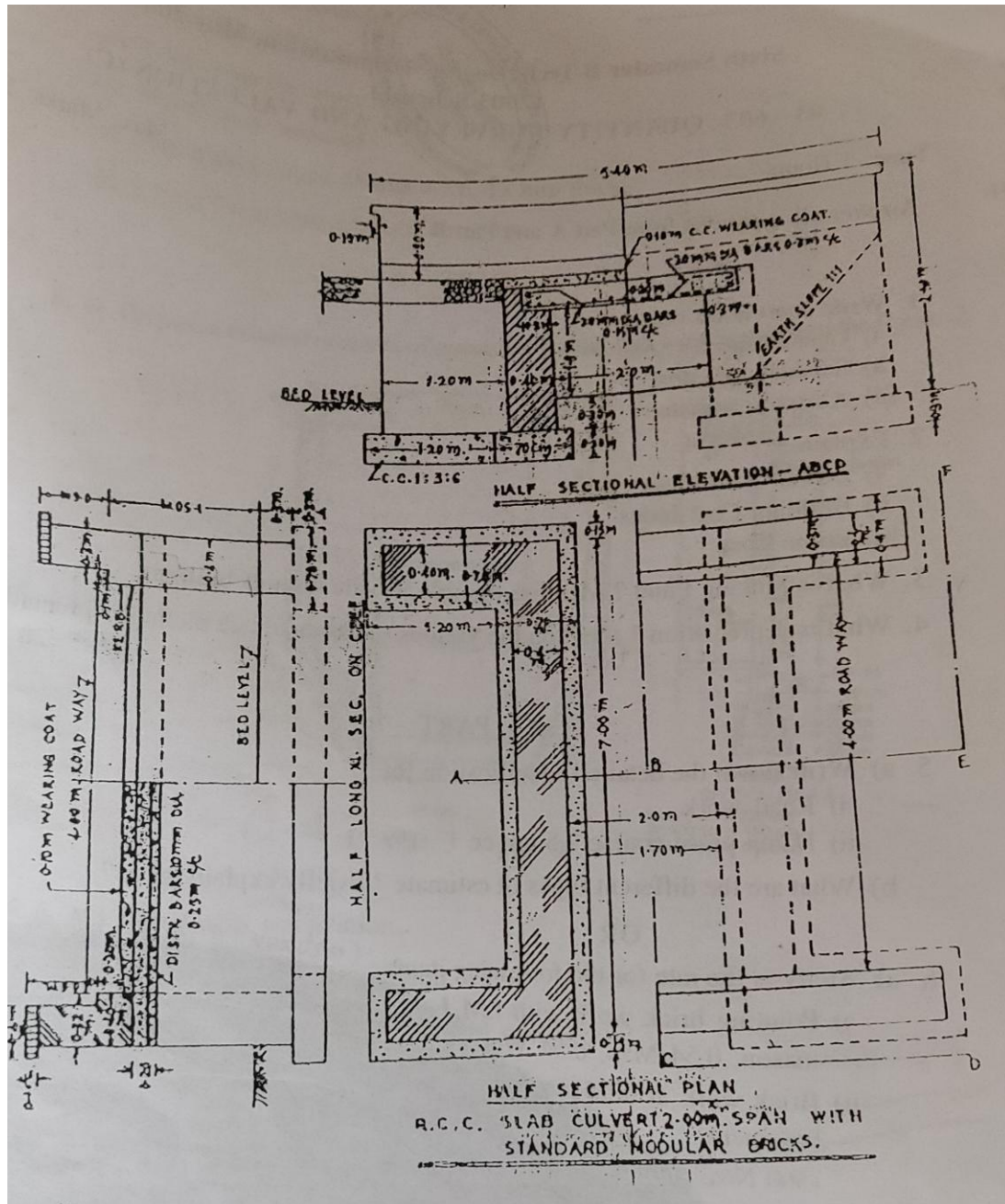

Fig. 5-5

4. Estimate the quantities of the items of the following items of a residential building
   a. Earth work excavation in foundation
   b. First class brick work in foundation
   c. Lime concrete in foundation
   d. Brick work in super structure
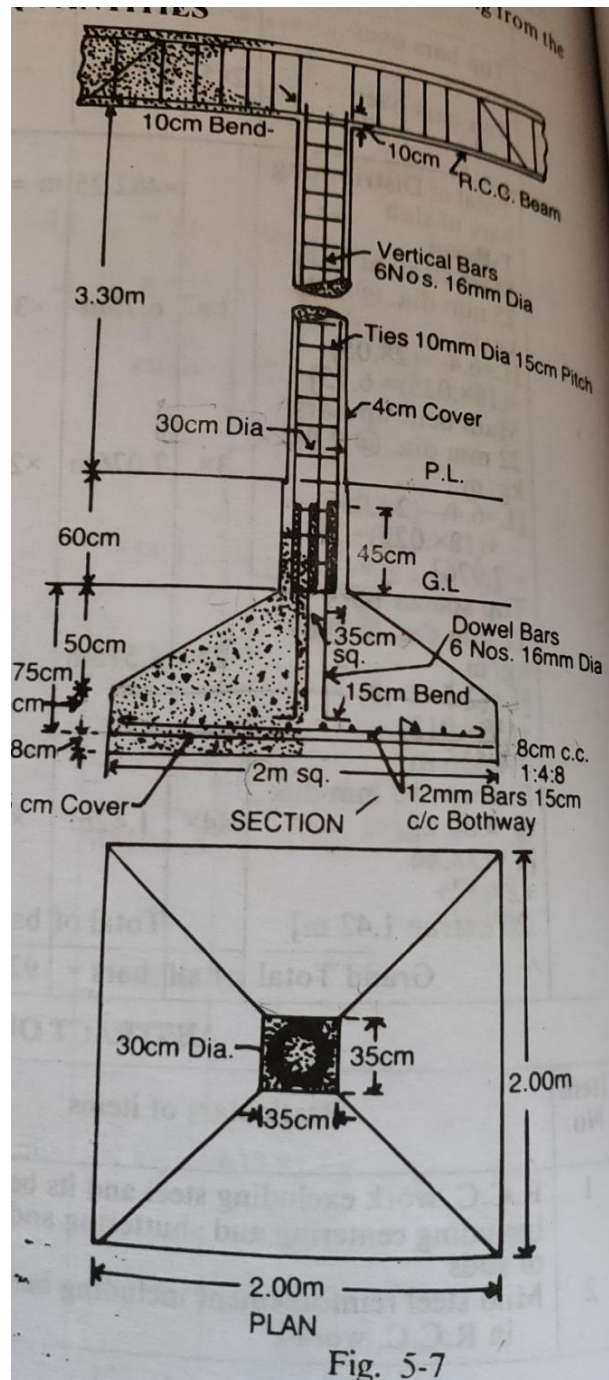   e. Dam proof course
   f. Plastering in walls   20 marks

PLAN

SECTION ON A A

D-120 cm × 220 cm
W-100 cm × 150 cm
S-100 cm × 190 cm
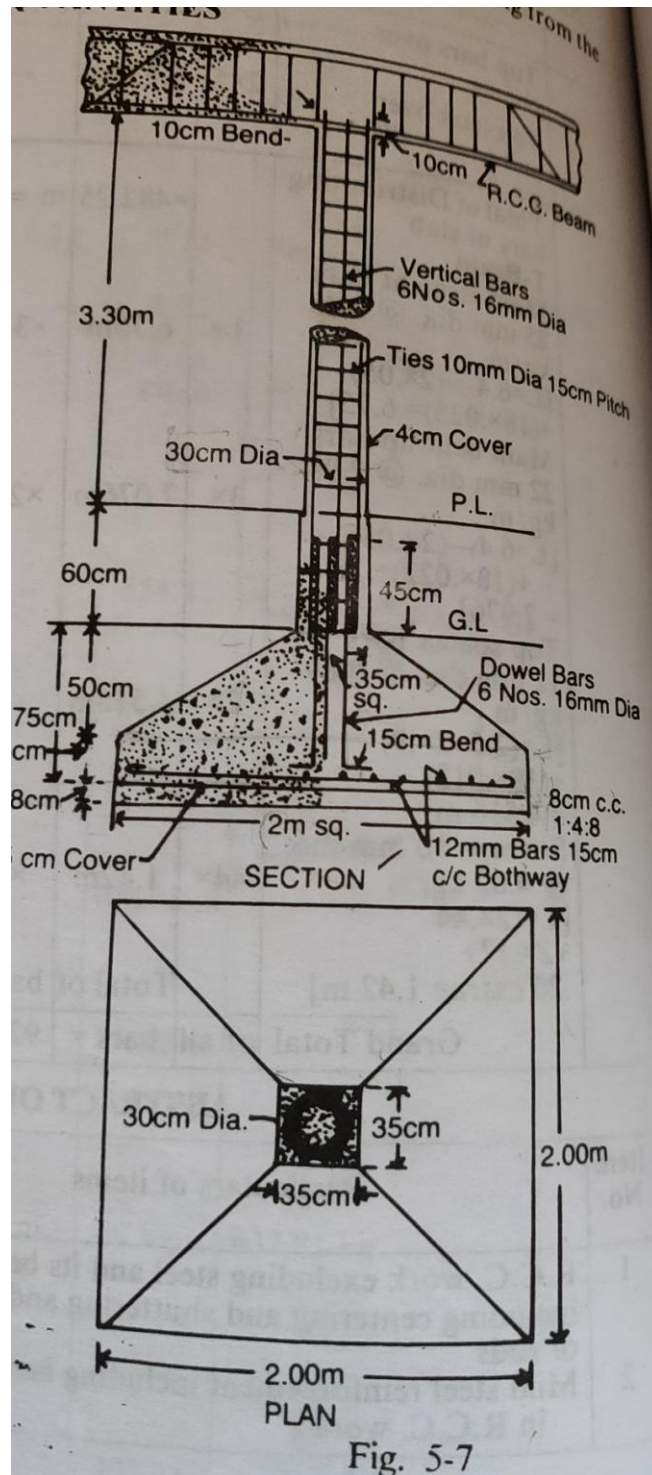
5. Calculate the quantities of following items of work for a single span RCC slab culvert as shown in figure   20 marks

HALF SECTIONAL ELEVATION - ABCD

HALF SECTIONAL PLAN

R.C.C. SLAB CULVERT 2·00m. SPAN WITH STANDARD MODULAR BRICKS.

6. Prepare the detailed estimate of RCC column with foundation footing from the given figure. Also prepare bar bending schedule   20 marks

10cm Bend-
10cm R.C.C. Beam
3.30m
Vertical Bars 6Nos. 16mm Dia
Ties 10mm Dia 15cm Pitch
30cm Dia
4cm Cover
P.L.
60cm
45cm
G.L
50cm
35cm sq.
Dowel Bars 6 Nos. 16mm Dia
75cm
15cm Bend
8cm
8cm c.c.
2m sq.
1:4:8
cm Cover
SECTION
12mm Bars 15cm c/c Bothway

30cm Dia.
35cm
2.00m
35cm
2.00m
PLAN

Fig. 5-7

7. Prepare the detailed estimate of RCC retaining wallof 30m span from the given figure. Also prepare bar bending schedule   20 marks

10cm Bend-

10cm R.C.C. Beam

3.30m

Vertical Bars
6Nos. 16mm Dia

Ties 10mm Dia 15cm Pitch

30cm Dia-

4cm Cover

P.L.

60cm

45cm

G.L

50cm

75cm

35cm sq.

Dowel Bars
6 Nos. 16mm Dia

cm

15cm Bend

8cm

8cm c.c.
1:4:8

2m sq.

12mm Bars 15cm
c/c Bothway

cm Cover

SECTION

30cm Dia.-

35cm

2.00m

35cm

2.00m

PLAN

Fig. 5-7

8. Prepare the detailed estimate of septic tank with soak pit from the given figure

20 marks

MODULE –IV

1. a. What do you understand by the following

   1. Out goings

   2. Year's purchase   (5 marks)

   b. An old building has been purchased by a person at a cost of 30000 excluding the cost of the land. Calculate the amount of sinking fund at 4% interest assuming there further life of the building as 20 years and the scrap value of the buildings as 10% of the cost of purchase (15 marks)

2. It is estimated that the capitalised value of a property is 10 lakhs including water supply, sanitary, electrical installations and the value of the land. if the rate of interest is 6% what shall be the net return from the property? Assume the outgoing to be 10% of the gross income, find the expected rent of the property per month.   20 marks

3. a. What are out goings enumerate the different types of out goings?   15 marks

   b. Write short notes on

      1. sinking fund

      2. Scrap value   5 marks

4. What is depreciation? Explain the various methods to calculate depreciation?   20 marks

5. Write short notes on

   a. Salvage value

   b. Obsolescence

   c. Freehold and lease hold property

   d. Book value

   e. Gross income and net income   20 marks

6. a. What you meant by valuation. What is the purpose of valuation?   10 marks

   b. Explain briefly about the types of valuation of a building   10 marks

7. Cost of a plot is RS. 60000 and a building costing 250000 have been constructed over it. The building consist of two flats. The owner of the flats expects 12% return on the cost of construction and 8% on the cost of the land. Work out the standard rent for each flat of the building. Life of the building is 75 years. Assume

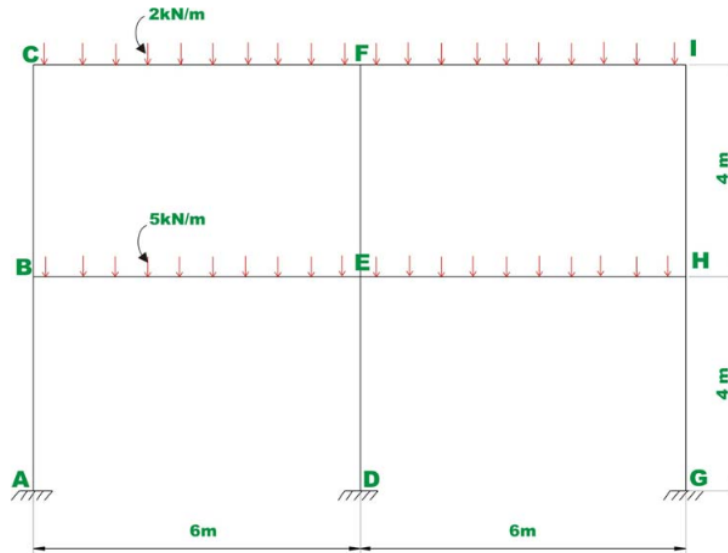   a. Cost of annual repair 1.5% of the cost of construction

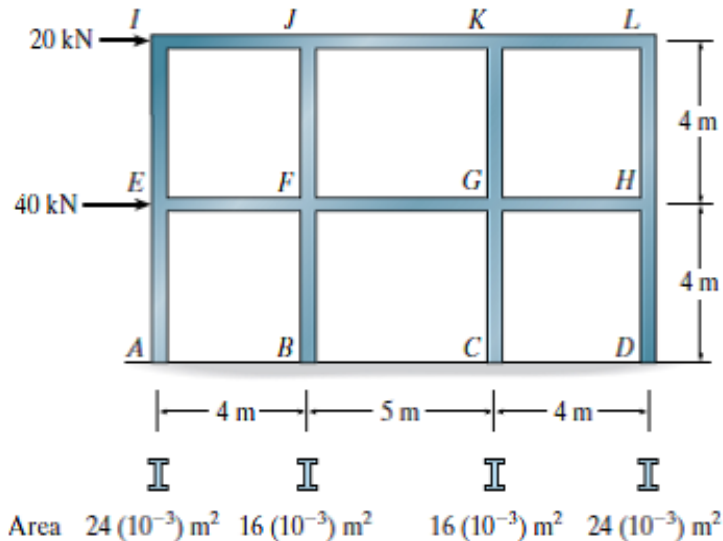   b. Other outgoings 25% of the net return on the building

   c. Sinking fund interest 4%.   20 marks

# CE 403 : STRUCTURAL ANALYSIS III

MODULE 1

1. Analyse the building frame shown in figure using substitute frame method.

2. Solve the problem using cantilever method .Eachb column has the column area as indicated.


3. Differentiate between cantilever method and portal method for lateral load analysis.

4. What are the assumptions of cantilever method

5. Explain approximate methos for analysis of multi story frames.

6. What are the assumptions in cantilever method of analysis?

7. Analyse the frame shown in figure using cantilever method. Cross-sectional area of members are shown in figure.
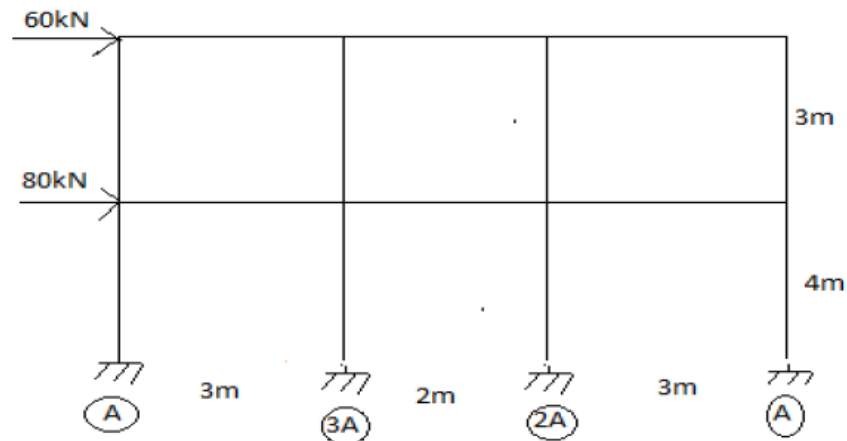
8. What are the assumptions in portal method of analysis?

9. Analyse the frame shown in figure 1 using portal method
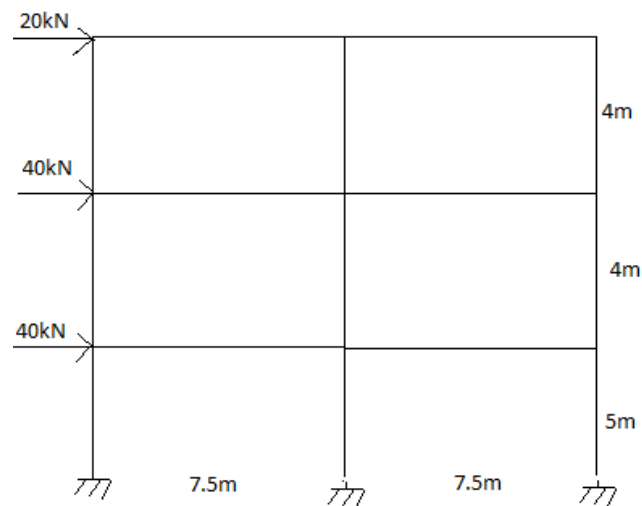
10. Explain the concept of physical approach.

MODULE 2

1. Define and explain with examples kinematic indeterminacy of structures.

2. Explain external redundancy and internal redundancy with suitable example.

3. Define the flexibility influence coefficient and stiffness influence coefficients with suitable examples.

4. Find the external and internal indeterminacies of the following structures.
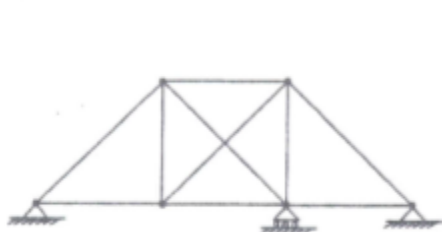
5. State and prove the relation between force transformation matrix and displacement transformation matrix.

6. Explain the formulae to find out the kinematic indeterminacy of pin-jointed and rigidjointed frames.

7. What is the relationship between stiffness and flexibility matrix

8. Compare nodal degrees of freedom and joint degrees of freedom.

9. Define stiffness influence coefficients. Illustrate with suitable examples

10. Explain the general procedure followed in displacement method of analysis

11. Define equilibrium and compatibility.

12. Define kinematic indeterminacy. Compute the kinematic indeterminacy of a rigid jointed frame of column height 'h' and beam span 'l' with one end fixed and other end hinged, if only the beam axial deformations are neglected.

MODULE 3

1. Derive the element flexibility matrix for a cantilever beam of span L . The free end is subjected to a downward vertical load V and an anticlockwise moment M.

2. Develop the flexibility matrix for the structure shown in figure 1 with reference to the given cordinates
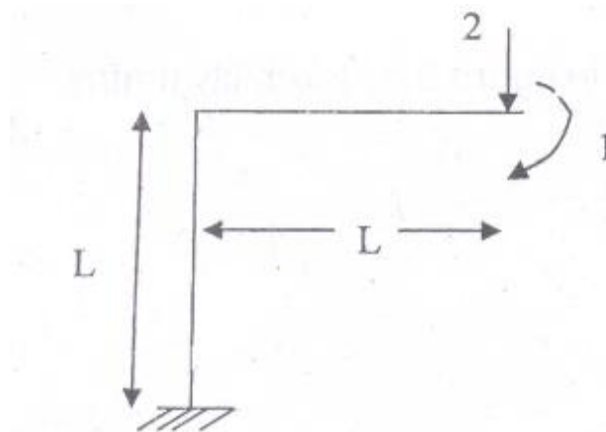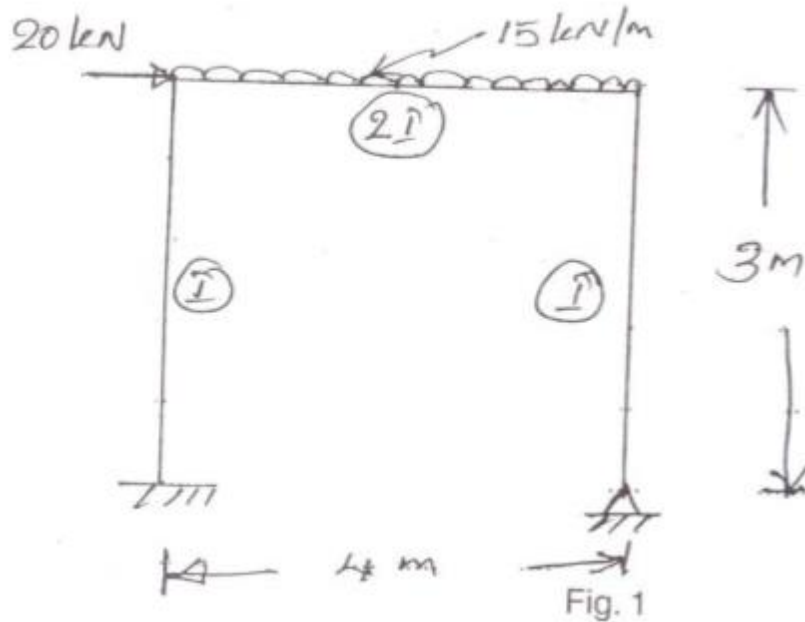

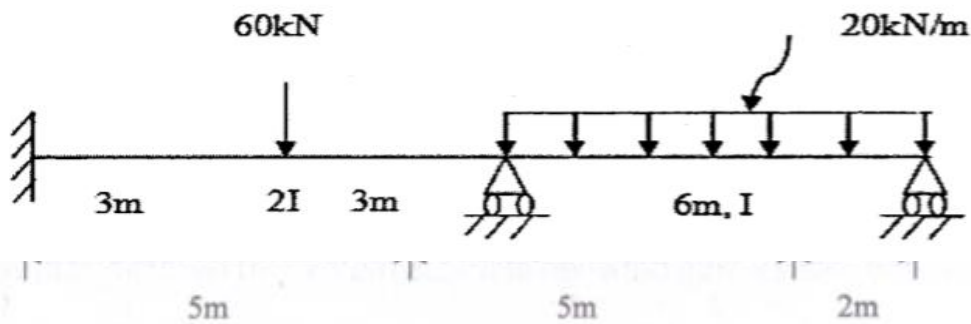3. Develop the force transformation matrix for the co-ordinates shown in figure
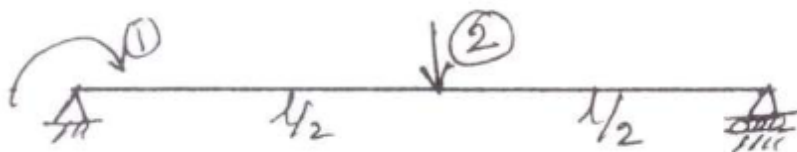
4. Find the deflection and rotation at the free end of the cantilever shown by flexibility approach
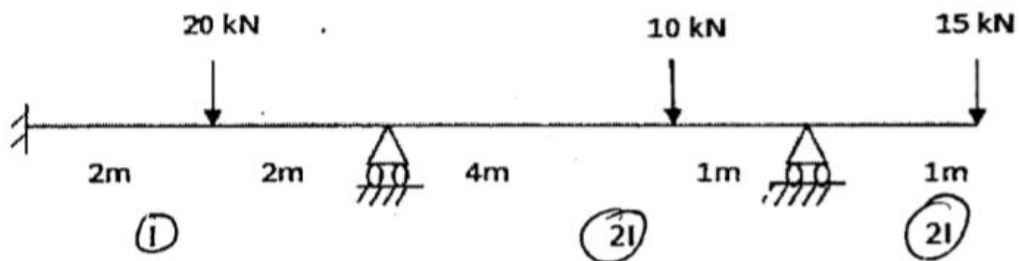
l, EI with load W at free end
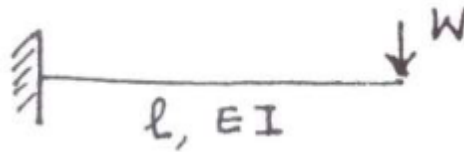
5. Analyse the frame using flexibility method and draw the BMD

20 kN

15 kN/m

2I

I   I

3m

4 m

Fig. 1

6. Analyse the continuous beam using flexibility method and draw the BMD

60kN   20kN/m

3m   2I   3m   6m, I

5m   5m   2m

7. Analyse the continuous beam using flexibility method and draw the BMD and SFD

20 kN   10 kN   15 kN

2m   2m   4m   1m   1m

①   2I   2I

8. Find the deflection and rotation at the free end of the beam shown by flexibility approach

200kN

1m, I   100kNm

2m, 2I
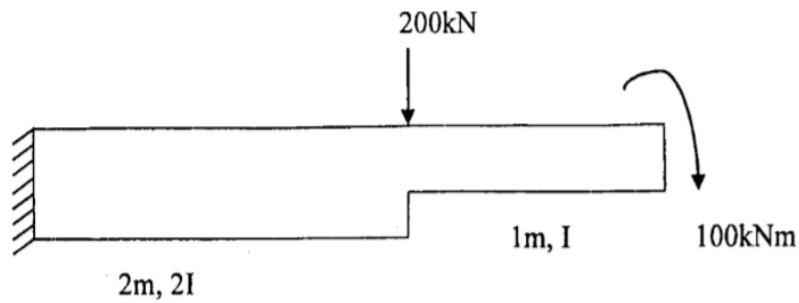
9. Explain the load transformation matrix approach in flexibility method

10. Explain analysis of plane trusses by flexibility method

11. Analyse the plane frame shown in figure 2 by flexibility matrix method and draw the SFD and BMD. The bottom support is fixed and top is made roller.
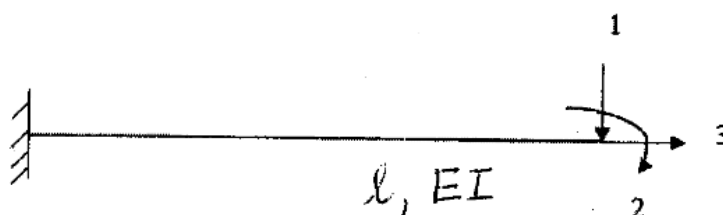

$20KN/m$

2m

40kN

4m

6m
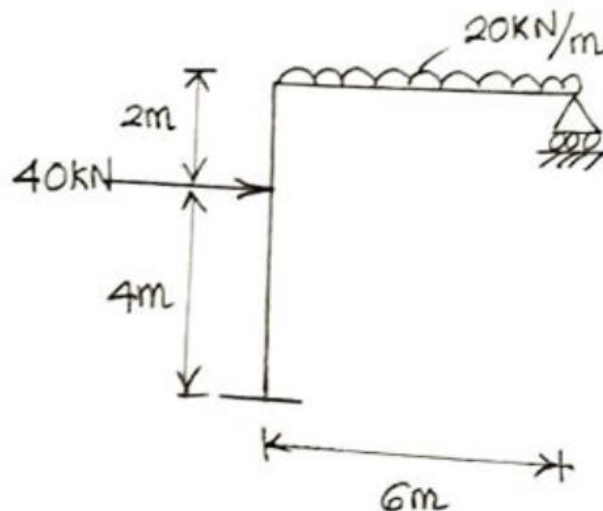
12. Discuss the formation of flexibility matrix for frame element

13. Discuss basic concepts of flexibility method

MODULE 4

1. a) Derive the stiffness matrix for the element shown in figure

1

3

ℓ, EI 2

b) Analyse the frame using stiffness method and draw the BMD
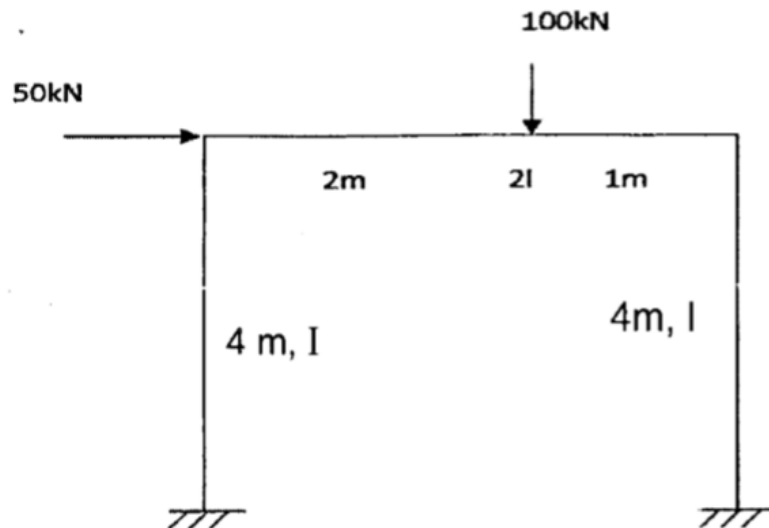
100kN

50kN

2m   2I   1m

4m, I

4 m, I

2. Analyse the continuous beam using stiffness method and draw the BMD and SFD

10 kN/m

30 kN

2m

2I

1

5 m   5 m

3. Analyse the continuous beam using stiffness method and draw the BMD and SFD

16kN

4kN/m   4kN

A   I   B   C   D   E

I   2I   2I

1m   6m   1m   3m   2m
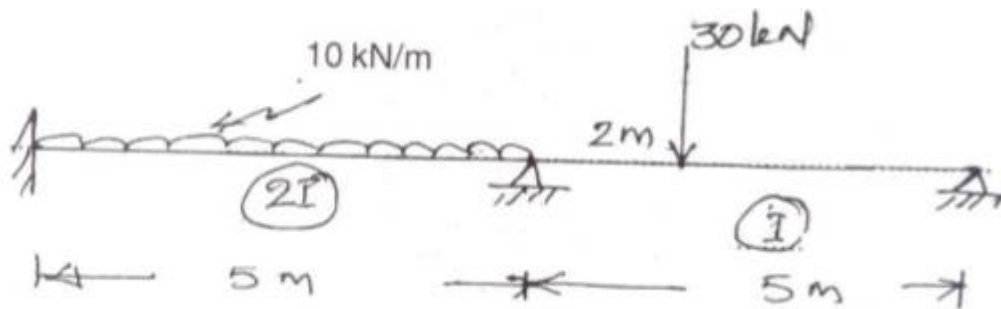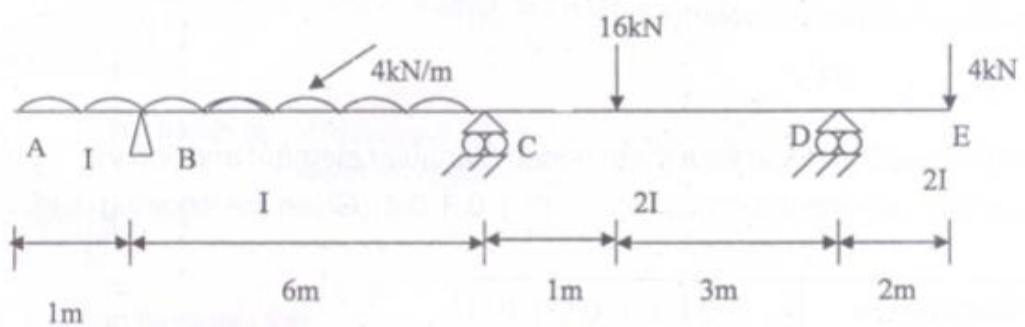
4. Analyse the frame using stiffness method and draw the BMD
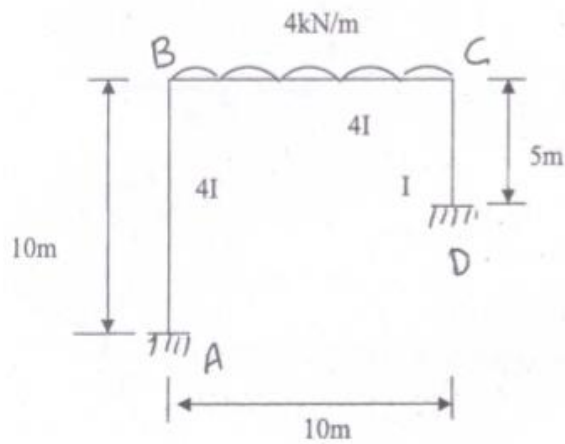
5. a. Discuss the advantages of stiffness method over flexibility method.

    b. Show that the flexibility and stiffness matrices are inverse to one another
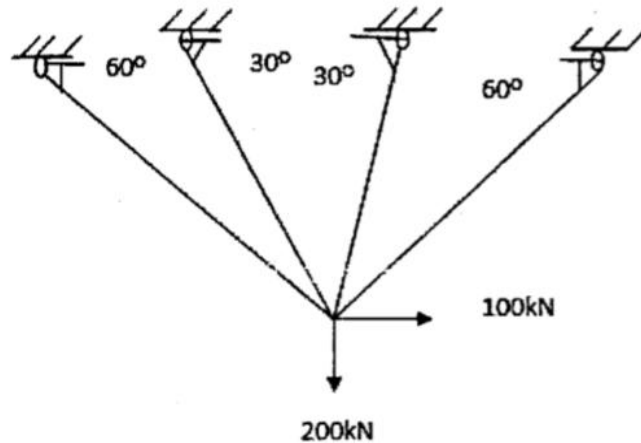
6. Analyse the pin jointed frame by stiffness method. Take AE/L constant for all the members.

7. Generate the stiffness matrix for the structure with the given co-ordinates and properties.
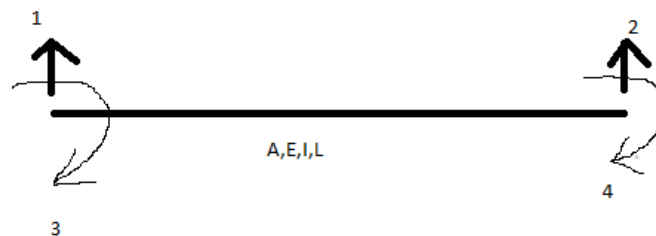
8. Define kinematic indeterminacy. Determine the kinematic indeterminacy of the following structures

a.   b.

c.

9. Analyse the truss shown in figure (with active global coordinates, as shown) and find the joint displacements, support reactions and bar forces. The truss is subjected to direct loads F1 = 50 kN; F2 = 30 kN, and a lack of fit due to bar AC being too long by 5 mm. Assume all bars to have same axial rigidity AE = 6000 kN. Use stiffness matrix method.

10. Derive the stiffness matrix for the structure with coordinates as shown in figure.

11. Analyse the rigid frame loaded as shown in Fig.3. using stiffness method.
    E = 200 × 10^6 kN / m²; I = 500 × 10-6 m4

12. Explain how the effect of calibration error or temperature changes is considered in the

analysis of trusses by matrix displacement method

13. Find the forces in the members of the truss loaded as shown in Fig.4. using stiffness method. Take axial rigidity AE = unity for all members.
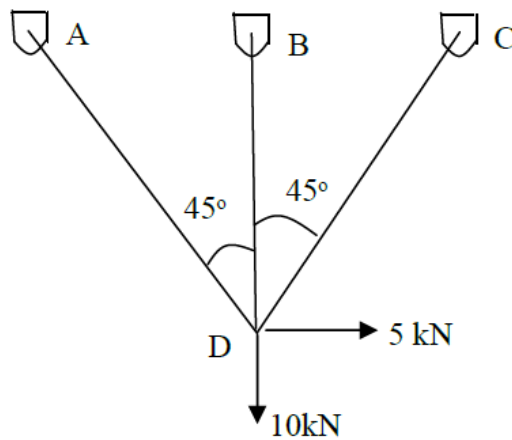
MODULE 5

1. a. What is meant by rotation matrix or transformation matrix in direct stiffness method?

    b. Briefly explain the direct stiffness method?Write the direct stiffness matrix for a truss element

2. a Differentiate between local and global coordin ate systems

    b. Analyse the beam as shown in figure by direct stiffness method?
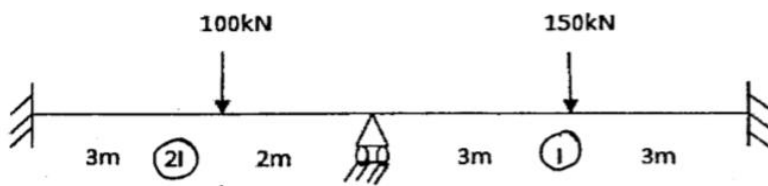
3. Analyse the frame using direct stiffness method and draw the BMD

4. Analyse the frame using direct stiffness method and draw the BMD
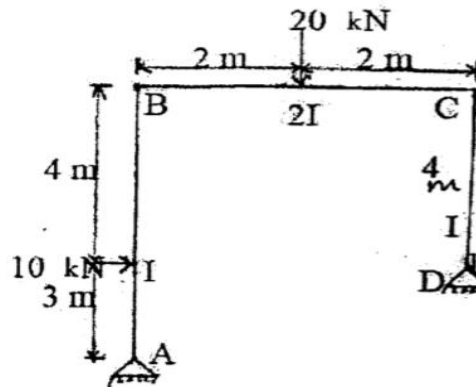
5. Discuss the procedure of Direct Stiffness Method in the matrix analysis

6. Analyse the continuous beam shown in figure using Direct Stiffness Method shown in figure and develop the BMD.
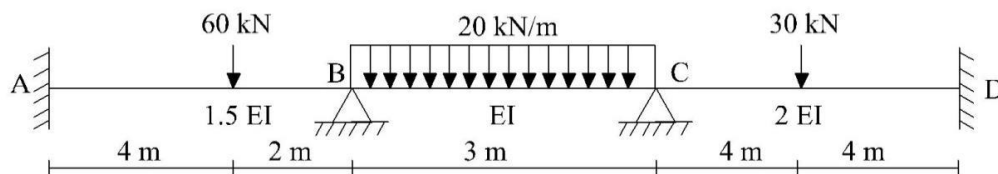
7. Explain Direct Stiffness Method in the matrix analysis

8. Analyse the beam shown in figure 6 using Direct Stiffness Method shown in figure and determine the member forces and moments

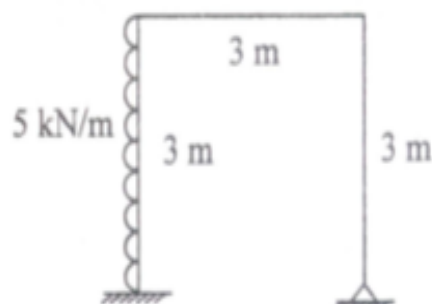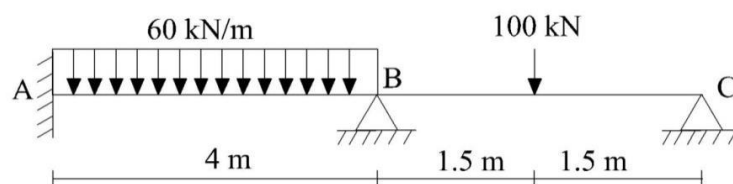
9. Describe the stiffness matrix of elements in global coordinates from element coordinates

10. Explain the rotation of axes in 2 Dimensions

MODULE 6

1. a. Explain negative damping with a suitable example
   b. A vibrating system consists of a mass of 5 kg and a spring of constant 15 kg/cm.The amplitude decreases to one fifth of the initial value after six consecutive cycles.

Determine the logarithmic decrement, ratio of successive aplitudes, damping ratio and damping coefficient.

2. Derive the equation of motion of sinfle degree of freedom system for free vibration and hence find the solution for under damped system, over damped system, critically damped system.

3. A mass of 5 kg is suspended on a spring and set oscillating. It is observed that the amplitude reduces to 5% of its initial valueafter 2 oscillations. It takes 0.5 seconds to do them. Calculate the following.

   i) The damping ratio

   ii) The natural frequency

   iii) The actual frequency

   iv) The spring stiffness

   v) The critical damping coefficient

   vi) The actual damping coefficient

4. A rigid uniform beam as shown in figure has a total mass m and length l. It is hinged at one end and restrained by a viscous damper of damping coefficient 'c" at the other end. A spring of constant k is connected to the beam at a distance "a" from the hinged end. If the bar moves in the vertical plane, formulate the equation of motion and derive an expression for the critical damping coefficient.

$$mass = m \ , \ length = l$$
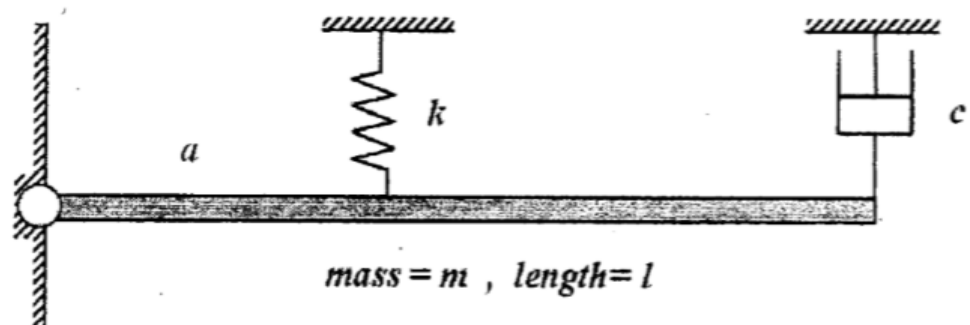
5. A mass m is suspended on a massless beam of uniform bending stiffness EI as shown. Derive the differential equation of motin for the system.
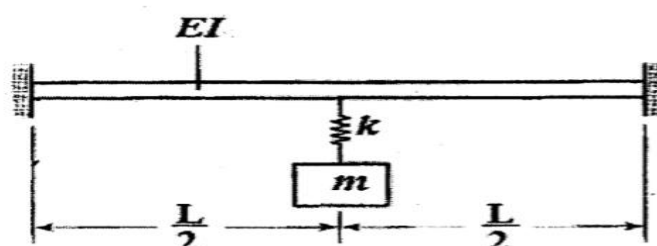
6. The main span of a bridge is considered as a SDOF system for calculation of its fundamental frequency. From preliliminary vibration tests, the effectivemass of the structure was determined to mbe40000tonnes and the effective stiffness to be 40000kN/m. The ratio of successive displacement amplitude from a freev vibration trace was measured to be 1.25 . Calculate the values of the structural damping coefficient and the equivalentviscous damping coefficient.

7. Write the equation of motions corresponding to the damped and undamped free and forced vibration.

8. Derive the equations for response of SDOF system subjected to damped free vibration in 'x' direction with inertia constant m, spring constant k and damping constant c. Draw the response diagram also.

9. Explain logarithmic decrement.Derive the equation for logarithmic decrement.
   Derive the response of the free vibration system with damped case and calculate the free vibration response of a SDOF system at time t=0.20 sec. for the following data
   Natural frequency ω= 12 rad/sec
   Damping coefficient ξ =0.15
   Initial velocity=10 cm/sec
   Initial displacement=5 cm

CE 405: ENVIRONMENTAL ENGINEERING –I (S7CE)

Module 1

1. Define the term "per capita demand". Write the factors affecting "per capita demand" and state the reasons for variations in demand.

2. The population figures of a town during the four decades i.e. 1960, 1970, 1980 and 1990are 25,000, 30,500, 35,500 and42, 000 respectively. Predict its population in the year 2000 and Compare the results through Arithmetical progression. Geometrical progression,Incremental increase method and Decreasing Rate method. (KTU Dec2018, June 2019)

3. Define Design period. What are the factors governing the design period?

4. In two periods each of 20 years a city has grown from 50000 to 110000 and 160000 find the population expected in the next 20 years and also the saturation population.

5. Determine the daily water demand of the city in 2031, if the per capita water demand is 135 Lpcd and the city population records is as given below.

6. What do you understand by the term 'Design Period'? (KTU May 2019)

Year 1961 1971 1981 1991 2001

Population 25000,52000,94000,164000,247000

7. a) Explain the various factors affecting consumption (10 marks)

b) What are various type of water demand, explain (10 marks) (KTU Dec2018)

Module 2

1. What are the requirements of potable water for domestic use?

2. Discuss the various Physical, characteristics of water. (KTU Dec2018)

3. Discuss the various Chemical characteristics of water.

4. What are the factors be considered for locating a pumping station?

5. Draw a neat sketch of canal intake and explain the working principle. State its merit and demerits.

6. a) What factors are required to be considered in the selection of the type of pump? (10 marks)

7. Discuss the situations under which the following types of may be used. A) Reciprocating pumps b.centrifugal pumps c.Air lift pumps. (10 marks)

8. Prepare a standard chart giving the drinking water quality standards for any 10 parameters as per BIS. (KTU May 2019)

Module 3

1. a) Explain the treatment processes carried out for the removal of impurities in water? (10 marks)

b) Sketch the layout plan of water treatment plan. (10 marks) (KTU June 2019)

2. Water has to be purified for a town whose daily demand is 9 x 106 litres/day. Design a suitable sedimentation tank of the water works fitted with sludge remover. Assume the velocity of flow, in the sedimentation tank as 22cm/min and the detention period as 8 hrs. (KTU Dec2018)

3. What should be the size of a rectangular sedimentation tank to treat 1.0 MLD with 2 hours detention and overflow rate less than 40,000 litres per day per sq.m. of the surface areas?

4. The following data are corresponding to a clariflocculator find the volume of a flocculation and its diameter Detention time: 30 min, Depth: 3 m, Outer diameter of the inlet shaft = 0.9 m, water to be treated: 10 ML/d (KTU Dec2018)

5. Derive stokes law

6. Find the settling velocity of a particle of 0.06mm diameter, having a specific gravity of 2.65 in water at a temperature of 20 oC .Take kinematic viscosity as 1.007*10-6 m2/sec.

7. Design a continuous flow rectangular sedimentation tank for a population of 20,000 persons with an average per capita demand of 120 litres per day. Assume detention period of 6 hours.

8. Design a clariflocculator for treating 3 MLD of water. Make suitable assumptions. Prepare a neat sketch.(KTU May 2019)

Module 4

1. Distinguish between the slow sand filter and rapid sand gravity sand filter (KTU Dec2018)

2. With the help of the diagram, explain the process of Rapid sand filter.

3. Design a rapid sand filter for a town having a population of 80,000 with an average rate of demand180lpcd. Assume suitable data

4. Explain the various filter troubles (KTU June2019)

5. Design a slow sand filter for atown of population60000,p provided water supply at the rate of 160 lpcd. Take rate of filtration as 2.5l/min, L/B ratio as2, maximum demand as 1.8 times avg. demand.

6. Explain pressure filter (KTU Dec2018)

7. With a neat sketch, explain the working of a slow sand filter.(KTU May2019)

Module 5

1. What is disinfection? List the commonly used disinfectants (KTU Dec2018)

2. Discuss the use of chlorine as disinfecting agent. What are the different types of chlorination? (KTU May2019)

3. Mention the type of aerators used in the water treatment

4. Explain lime-soda process and zeolite process (KTU Dec2018)

5. Explain electrodialysis

6. What is adsorption? What are the factors affecting adsorption

7. Give an account on Ion Exchange Process. Explain its advantages also. (10 marks) (KTU May2019)

8. How can you remove permanent hardness by Lime Soda Process?(10 marks) (KTU May2019)

Module 6

1. What are the components of a water supply system? Explain (KTU Dec2018)

2. What is different system of distribution networks? Explain (KTU May2019)

3. What are various methods of water distribution

4. What are the different method of analyzing a given distribution system? Explain Hardy Cross method of pipe network analysis. (KTU Dec2018, June 2019)

5. Mention any three pipe appurtenances with neat sketches.

6. What are the different types of Distribution reservoirs

7. Explain the equivalent pipe method with neat sketch. (5marks) (KTU Dec2018, may 2019)

8. Explain the theory of chlorination. (6marks) (KTU Dec2018, may 2019)

CE407 – TRANSPORTATION ENGINEERING I

MODULE 1

1a. What special methods would you adopt to make track alignment if heavy gradient are unavoidable in a particular region? *(Nov, 2011) (10)*

1b. Draw the cross section of a double line broad gauge track in cutting on a straight track.

2a. List the requirements of an ideal permanent way.　　　　　*(Nov, 2014), (Dec, 2015)(10)*

2b. What are obligatory points?　　　　　　　　　　*(Nov 2014)(10)*

3a. Briefly discuss various types of sleepers used in railways. *(Nov, 2014)(10)*

3b. Explain the various systems of railways.　　　　　　　*(Nov, 2014)(10)*

4. Explain the role of rail transportation in the development of a country. *(VTU,2010)(20)*

5a. Write any two track modernisation techniques used in present days. *(ANNA, 2014)(10)*

5b. What is the significance of 'Uni-gauge' in railway planning? *(ANNA, 2014)(10)*

6. Explain the classification of Indian railways.　　　　　　*(May, 2012)(20)*

7. Explain the term ballast less track and its advantages　　　　*(KTU, DEC 2017)*

MODULE 2

1a. What are the different types of fish plates in use? Illustrate with sketches. *(Nov, 2011)(10)*

1b. Write down the appropriate formula for the speed in curves for broad gauge in terms of radius of curve, with or without transition curve.*(Nov, 2011)(10)*

2. A 9° degree branch curve diverges out from a 8° main curve in opposite direction in a M.G. yard layout. If the speed restriction is 25kmph on main line and permissible cant deficiency in 5.1 cm. What would be the speed limit on branch line? *(Nov, 2011)(20)*

3. Explain the necessity of widening of gauge on curves. If wheel base of a vehicle moving on

   a broad gauge track is 1.5 m and depth of flange below top of rail is 3.2 cm. Determine extra width required to be provided on gauge, if curve is 5°. *(Nov, 2011)(20)*

4. Derive the expression for super elevation for a railway track.*(Nov, 2014)(20)*

5a. A 6° curve branches off a 3° main curve on a broad gauge track. If the speed on the main line is 60 kmph, find the restricted speed on the branch line.*(Nov, 2014)(10)*

5b. What is meant by coning of wheels, tilting of rails and adzing of sleepers? *(Nov, 2014)(10)*

6a. What is meant by coning of wheels? Why is it necessary?*(Dec, 2015)(10)*

6b. What are the functions of ballast in a railway track? *(KU, 2013)(10)*

7 . Explain the different types of grades used ? whats is grade

   compensation and its advantages   *(KTU, DEC 2017)*

MODULE 3

1a. Draw a neat diagram of a simple left hand turnout and show its component parts.

                                                                   (Nov, 2011)(10)

1b. Find out crossing angle of 1 in 8.5 number of crossings using right hand method and centre line method. *(Nov, 2011)(10)*

2a. Describe loops and sidings by means of sketches. *(Nov, 2011)(10)*

2b. Explain track circuiting. *(Nov,2011)(10)*

3. Determine the required elements for laying the 1 in 12 turnout when it springs from the heel of switch a an angle of 1°8'0" from a broad gauge track and ends at theoretical nose of crossing keeping the curve tangential to the tongue rail. Assume the heel divergence as

   13.33 cm. *(Nov, 2011)(20)*

4. What is meant by a level crossing? Discuss in detail how the level crossings are classified in

   India. *(Nov,2011)(20)*

5a. Describe with sketches the layout of a wayside station on a double line. *(Nov, 2011)(10)*

5b. Explain the terms : a) diamond crossing b) cross over*(Nov, 2014)(5)*

5c. Define "number of crossing". How is it calculated*? (Nov, 2014)(5)*

6. Design the elements of a single cross over on broad gauge track as per Indian Railway method for the following data: a) 1 in 12 crossing b) the two parallel tracks are 7m centre to centre. *(Nov, 2014)(20)*

7a. Explain the methods of controlling train movements? Discuss any two in detaiL

(Nov, 2014)(10)

7b. What are Marshalling yards? Explain the different types of Marshalling yards with sketches. *(Nov, 2014)(10)*

8a. Write short notes on scissors cross over and three throws. *(Dec, 2015)(10)*

8b. How are railway signals classified according to their location? *(Dec, 2015)(5)*

8c. Explain basic principles of interlocking of points and signals. *(Dec, 2015)(5)*

MODULE 4

1a. What is meant by a rail closure? *(Nov, 2014)(10)*

1b. How is creep explained by wave theory? *(Nov, 2014)(10)*

2a. Explain the factors contributing to the development of creep. Also mention the method of measurement and correction of creep. *(Dec, 2015, Dec 2016)(10)*

2b. Name at least five causes of rail failures.*(JNTU, 2015)(10)*

3a. Define wheel gauge. What are the different wheel gauges used in India? *(JNTU, 2015)(10)*

4. Illustrate various types of rail failures with sketches. *(JNTU, 2015)(20)*

5a. Write shortly the 'track renewal' with its types in track maintenance. *(ANNA, 2014)(10)*

5b. Write shortly on stabilization of track on poor soil. *(ANNA, 2014)(10)*

6a. Which portion of the track are more susceptible to creep? *(KU, 2013)(10)*

6b. What are the causes of buckling of rails? *(KU, 2013)(10)*

MODULE 5

1. Describe various methods of tunnelling in hard works and mention the advantages and disadvantages of each of them. *(Nov, 2011)(20)*

2. Draw typical cross sections of tunnels and mention their applications. *(Nov, 2014)(20)*

3a. List the methods of tunnelling in soft soil. Discuss any two in detail. *(Nov, 2014)(10)*

3b. Explain the principles of tunnel drainage. *(Dec, 2015)(10)*

4. Explain the vertical shaft and pilot tunnel systems of tunnelling. Sketch and explain various shapes of tunnels. *(Dec, 2016)(20)*

5a. Explain the need for tunnel ventilation. Discuss the basic principles involved. *(Dec,2016)(10)*

5b. Mention the objects of tunnel lining. List the materials used for lining. *(VTU, 2009)(10)*

6. Explain with neat sketches the Needle Beam method of tunnel construction. *(VTU, 2009)(20)*

7a. With a neat sketch explain fore poling method of tunnelling in soft soils. *(VTU, 2010)(10)*

7b. Sketch and explain the use of pilot tunnels. *(May, 2012)*

MODULE 6

1a. Explain 'littoral drift' and its effects. *(Nov, 2011)*

1b. What are the different types of docks? List functions of each. *(Nov, 2011)*

2a. Distinguish between a) Transit shed and ware house (Dec, 2015) b) Light house and beacon. *(Nov, 2011)(10)*

2b. List the various types of harbours. *(Nov, 2014)(10)*

3a. What are lock gates used for? *(Nov, 2014)(10)*

3b.   State the factors which influence the height of a water wave at a particular location. Mention any empirical rule for estimating the height of wave. (Nov, 2011)(10)

7.   State the types of dredging devices commonly used in harbour engineering practice. Explain with a neat sketch the operation of a Dripper dredge. (Nov, 2011)(20)

8a.   How are breakwaters classified? Explain. (Nov, 2014)(10)

8b.   Write short notes on a) Stevenson's formula on entrance width b) Dolfins c) Wharf. (Nov, 2014)(10)

9a. What is meant by a floating deck? Explain its working. (Nov, 2014)(10)

9b. Explain any 4: a) Wave parameters b) Littoral drift c) Fenders d) Floating dry dock e) Beacons and buoys. (Dec, 2015)(10)

QUESTION BANK FOR GEO ENVIRONMENTAL ENGINEERING (CE 465) S7CE

MODULE 1

1	A) Enumerate the geotechnical problems due to soil –water environment interaction	KU, Dec 2016	7
	B) How are waste classified? Write short note on geotechnical charecterisation of waste		8
2	A) Explain the different remedial measures for waste dump	KU, Dec 2016	8
	B) Briefly explain physical and chemical characterization of waste		7
3	A) Write note on Waste disposal on Land	KU, Dec 2016	8
	B) What are the different types of waste and explain how they can be disposed		7
4	A) What is a waste dump?. Write the different methods of remediation	KU, Dec 2013	10
	B) What are the changes occurring in a waste dump? Suggest remedial measure for the same		5
5	A) Explain the soil-water-environmental interaction on geotechnical problems	KTU, Dec 2018	8
	B) What are the geotechnical properties of solid waste		7
6	A) With neat sketch, write multiphase behavior of soil	KTU, Dec 2018	3
	B) Explain the environmental impacts of waste dumping		5
	C) List out and explain various waste management strategies		7

MODULE 2

1	A)Write short note on Geotechnical reuse of flyash	KU, May 2016	8
	B)Write the guidelines for selection of site for landfill		7
2	A) Estimate the life of a above land landfill for a user population of 10,000, available area for landfill is 50,000 m2 Water table is at 5m below ground level. Height of landfill restricted to 8m. Assume that soil occupies 20% of the compacted volume. Assume suitable data if required	KU, May 2016	10
	B)Discuss types of landfills and mention the guidelines for selection of land fill		5
3	A)Enlist the key characteristics of an engineered landfill that distinguishes it from an open dump.	MG, May 2016	5
	B)What do you understand by geotechnical reuse of waste material? Explain applications of demolition waste		10
4	A) Explain the different geotechnical applications industrial wastes produced in India	KU, May 2016	5
	B)How will you make ranking of different sites for landfill construction		5
	C) Write short note on MoEF guidelines for selection of site for landfill		5
5	A) Draw a typical section of a landfill and explain the different components.	KU, Dec 2016	5
	B) How will you make a preliminary estimate for the area required for a landfill		5
	C) Write short note on geotechnical properties of fly ash		5
6	A)What do u mean by fly ash? How will you obtain it?	KTU, Dec 2018	5
	B)List out geo technical applications of fly ash		5
	C)Write a short note on municipal solid waste		5

MODULE 3

1	A) Draw a typical cross section of a landfill and explain the functions of each	KU, Dec 2013	5
	B) Explain different types of liners with figures		5
	C) Explain the criteria for selection of soil for clay liner		5
2	A) What is difference between barrier and a liner? Explain different types of barrier material with their functional differences.	KU, May 2016	10
	B) Write short note on selection of clay for compacted clay liner		5
3	A)Explain with figure the different combinations of GCL, geomembrane and CCL	KU, May 2016	5
	B) Explain the different methods for determining the permeability of liners in the field		5
	C) What are the different classification of waste?		5
4	A)What are the major components of a land fill? Explain the function of each component	KTU, Dec 2018	10
	B)How will you evaluate the capacity of a landfill?		5
5	A)What are the basic functions of cover system?	KTU,Dec 2018	8
	B)Explain with neat sketches the classification of landfill liners based on type of material		7

MODULE 4

1	A) Write note on adverse effects of leachates production in sanitary landfill	KU, Dec 2013	7
	B) Explain detection and remedial measures for control of subsurface contamination		8
2	A) Briefly explain the different types of geosynthetics for landfill application	KU, Dec 2016	5
	B) Explain the different testing methods for geomembrane		5
	C) Write short note on post closure monitoring of landfills		
			5
3	A)Write short notes on utilization of landfill gases	KU, Dec 2013	7
	B) Describe with figure the different gases produced at different stages of decomposition of waste in a landfill		8
4	A)What is leachate? How disposal of leachate done?	MG, Dec 2013	5
	B)Expalin the different testing methods for Geosynthetic clay liners		10
5	A)How can we dispose dispose leachate collected from a landfill?	KTU, Dec 2018	5
	B)What are the different properties of geo membrane?		10

MODULE 5

1	A) Explain the process governing the transport of contaminant in saturated soil.	KU, May 2016	8
	B) Compute the total dissolved contaminant transport due to advection and diffusion through a liner of thickness one meter with a coefficient of permeability 1x10-7cm/sec and effective diffusion coefficient 1x10-8cm/sec for total dissolved solids. Porosity of clay is 0.35. Total dissolved solids in leachate above liner is 2500mg/liter and below the liner is negligible. Leachate head above liner is 15cm		12
2	A)Write in detail the different methods of remediation of soil	KU, Dec 2016	10
	B) How will you plan an investigation on a contaminated location?		10
3	Explain the different methods of containment transport in saturates soil media	MG, May 2016	20
4	A) Explain the different methods of soil remediation specifying the advantages and disadvantages	KU, May 2016	10
	B)Write short notes on 1)Soil washing 2)Bio-remediation of soil		10
5	A) Name the law governing the transport of contaminant in saturated soil. Explain the different pathways of contaminant movement.	KU, May 2016	6
	B) Explain how the geotechnical imvestigation of contaminated site is done		6
	C) Explain the methods of phyto remediation and electro-kinetic remediation		8
6	A)Write in detail the approach for planning and implementing a successful remediation process	KTU, Dec 2018	6
	B)Write briefly about bioremediation		6
	C)List out different sampling techniques for contaminated soil		8
7	A)What are the advantages and disadvantages of ex-situ and in-situ remediation techniques?	KTU, Dec 2018	7
	B)Explain method of in-situ thermal desorption		7
	C)Write down difference between thermal desorption and vitrification		6

MODULE 6

1	A) Explain how Atterberg and shear strength of soil varies due to soil contamination	KU, May 2016	10
	B) Explain the effect of exchangable ions on the Atterberg limits of soil with montomorillonite and illite mineral		10
2	Explain the effect of change in environment on swelling and consistency of soil	KU, May 2016	20
3	A) Explain any two engineering properties of soil due to change in environment.	KU, May 2016	10
	B) Explain the variation in liquid limits with changes in pore fluid		10
4	Describe the effects of pollutants in soil on A)Index properties B)Volume change behavior C)Shear strength D)Permeability	KTU, Dec 2018	20

Environmental Impact Assesment

Module 1

1. What do you mean by EIA? Describe in short the relevance

2. Describe the various steps in EIA process with the help of a flow chart?

3. Explain the need for conducting EIA

4. Write short note on environmental clearance procedure in India

5. Explain the need and procedure of public consultation in detail

6. Write short note on 2006 EIA notifications

Module 2

1. Differentiate between point and non point sources of water pollution
 with examples

2. Describe the impacts of any two water pollutants

3. Explain in detail various control measures for three major air pollutants

4. Explain carbon cycle with a neat sketch

5. which are all the major types of air pollutants and briefly discuss their effects on health, environment and society

Module 3

1. What is e waste? Discuss its effect on environment

2. Explain in detail about noise pollution, effects , sources and prevention

3. Explain solid waste management and its sources

4. Discuss in detail about ozone layer depletion with chemical reactions

5. Briefly explain pesticide pollution and its effects

Module 4

1. What are the impacts of deforestation

2. Write short note on land degradation with recent examples

3. what are all the effects of climate change on planet earth ? How we can overcome the same?

4. Development can be a boon and a curse – discuss on this based on the impact on wild life and vegetation

5. differentiate between global and local pollutants

Module 5

1. Explain in detail event tree analysis with examples

2. Write short note on matrix methods – advantages and disadvantages

3. differentiate between overlays and checklists

4. What is the role of an environmental engineer during these days

5. how public participation helps in environmental protection

Module 6

1. Discuss about the socio economic impacts associated with an airport project

2. Explain any case study of EIA in detail

3. Explain standards of noise quality in detail

4. What is environment management plan

5. discuss on water quality paramenters and standards

Note: Each question carries 10 marks