DADI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi & Affiliated to JNTUK, Kakinada)
NAAC ACCREDITED INSTITUTE
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NH -5, ANAKAPALLE – 531 002, Visakhapatnam, A.P.
Phone: 08924-221111; E-Mail: info@diet.edu.in

QUESTION BANK (Academic Year 2018-19)

BUILDING PLANNING AND DRAWING

J.B.S.BHARATHI, *Assistant Professor*

II Year B.Tech – II Semester Branch: CE

UNIT-I- BUILDING BYE LAWS & REGULATIONS

1. Write short notes on building bye-laws for lighting, ventilation and wall thickness.
2. What is the difference between Floor carpet area? Explain in detail
3. What are the Building Bye-laws? Explain in detail along with the objectives of Bye-laws.
4. Write short notes on floor area. How is it related to height of the building?
5. Define floor space index. What is the difference between Law and Bye-laws?
6. Explain the building bye-laws with reference to open space requirements& lighting and ventilation requirements.
7. What are the various principles underlying building bye-laws? When do you apply the building bye-laws?
8. Explain in detail the classification of buildings. Also state the built-up area limitations

UNIT-II – RESIDENTIAL BUILDINGS

1. Describe the characteristics of various types of residential buildings.
2. Discuss briefly the purpose, functions and requirements of Kitchen, study room and Dining room.
3. Explain in detail the purpose, functions and requirements of Dining room, study & pooja room.
4. What are the factors to be considered by a planner prior to plan a residential building? Explain each component on detail.
5. Write short notes on Bye-laws for open in building and for size of rooms and ventilation.
6. What are the factors that are to be considered by planner prior to planning of a residential building? Explain any two of them in detail.
7. Define CPM and PERT. Explain the difference between both
8. Give the standard dimensions for Bed room, verandah, Kitchen and dining room of a Residential building

UNIT-III – PUBLIC BUILDINGS

1. What are the requirements for the dining room, drawing room, kitchen and bedroom in planning of residential building?

2. Explain the components involved in the design of Bank Building.

3. Enumerate the basic requirements of an educational institution and explain in detail
4. Differentiate between the following: (i) Hotel and motel, (ii) Dispensary and clinic.
5. What are the components of an Industrial building? Explain the principles involved inthe design.
6. Explain in detail the characteristics of various types of residential buildings
7. Define the terms EST, LST, Float, EFT, LFT.

UNIT-IV – SIGN CONVENTIONS AND BONDS

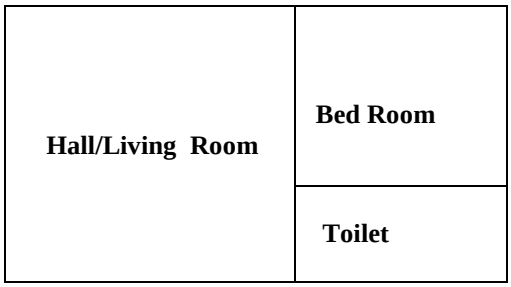
1. Draw the conventional signs for the following represented in a sectional elevation : a) Stone masonry b)Concrete c) Sand d)Wood e)Brick f)Earth g)Cinders
2. Draw the plan of one and a half brick wall in English bond & Flemish Bond for a wall
3. Draw the plan of two brick wall in English bond & Flemish Bond for a wall

UNIT-V – DOORS, WINDOWS, VENTILATORS AND ROOFS

1. Draw to a suitable scale the plan of the fully paneled door
2. Draw to a suitable scale the plan of the fully paneled window
3. Draw the line diagram of a king-post truss showing the various components
4. Draw the line diagram of a queen-post truss showing the various components

UNIT-VI – PLANNING AND DESIGNING OF BUILDINGS.

1. The line diagram shows one bed room residential building . Draw the plan , elevation , section to a suitable specifications.



2. Draw the line diagram of a residential building with the given line sketch to a scale of 1:100

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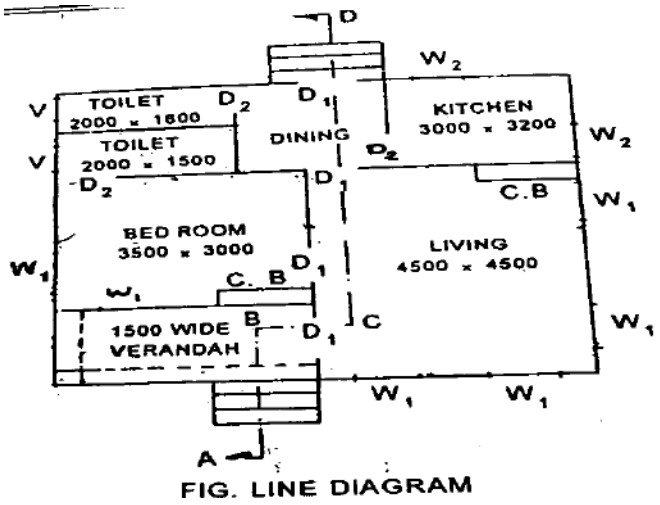


FIG. LINE DIAGRAM

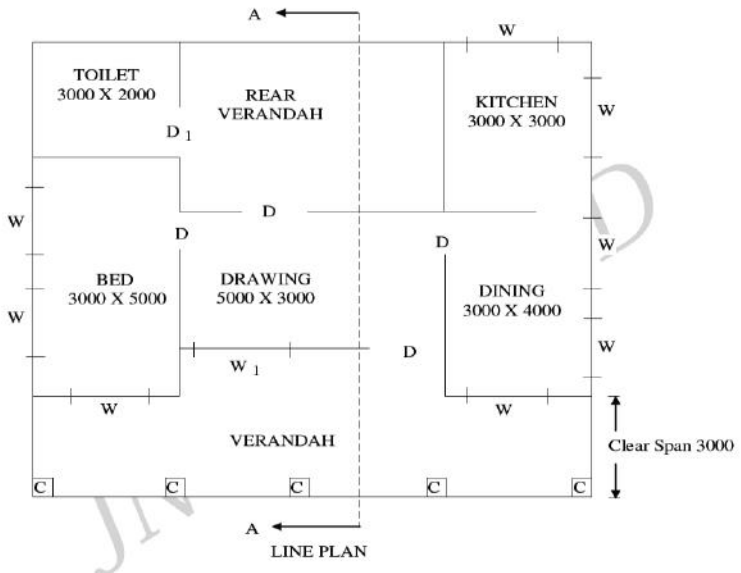
3. Draw the plan section and elevation of a " PRIMARY HEALTH CENTRE " .Assume the dimensions

4. Draw the plan for " HOSTEL " assume the dimensions

5. Draw the plan for "EDUCATIONAL INSTITUTE" assume the dimensions

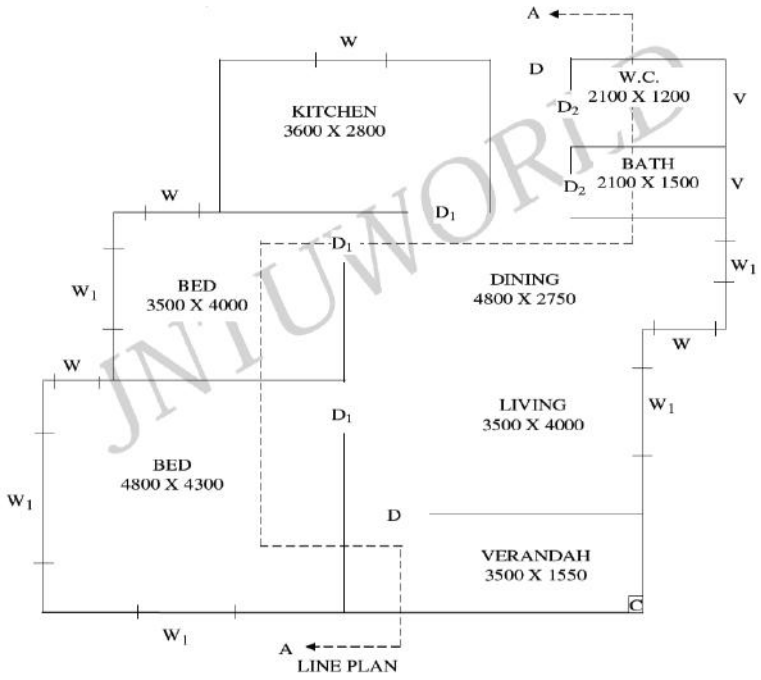
6. Draw the plan, Elevation & Section for the following line diagram

Assume D1 – 800 x 2000, D – 1000 x 2000, W – window Glazed – 1500 x 1000, W1 –Window Glazed – 2000 x 1000, V – Ventilator Glazed – 800 x 500, wall thickness –300mm



7. Draw the plan for Elevation & Section for the following line diagram

Assume D1 – 800 x 2000, D – 1000 x 2000, D2 – 700 x 2000, W – window Glazed – 1500 x 1000, W1 – Window Glazed – 2000 x 1000, V – Ventilator Glazed – 800 x 500, wall thickness – 300mm



8. Draw the plan for Elevation & Section for the following line diagram

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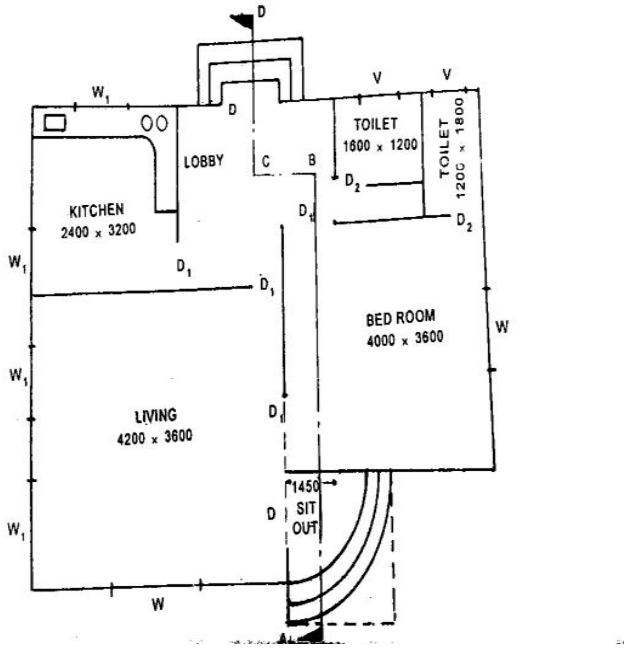

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DEPARTMENT OF CIVIL ENGINEERING

Concrete Technology Question Bank (2018-19 AY)

Faculty Name: LAVANYA.P **Branch: CIVIL**

Year: II Year **Semester: II SEM**

Unit-1 INGRDIENTS OF CONCRETE CEMENTS&ADMIXTURES

1. (a) Explain the classification of admixtures.
   (b) Explain the various tests to obtain the physical properties of cement.

2. (a) Explain the alkali-aggregate reaction and the factors influencing the alkali aggregate reaction.
   (b) Explain the importance of grading of aggregates and describe the various types of gradation.

3. (a) Explain the mechanism of hydration of cement.
   (b) With neat examples explain various performance of super Plasticizer in modifying the performance of concrete.

4. (a) Explain the classification of aggregates.
   (b) Describe the various mechanical properties of aggregates.

5. (a) Explain the chemical composition of Portland cement.
   (b) Explain the importance of fineness of cement and describe the various tests to obtain the soundness of cement.

6. Explain the following mineral admixtures
   (a) Fly ash
   (b) Blast furnace slag
   (c) Silica fume

Unit-2 FRESH CONCRETE

1. (a) Define workability and explain the factors affecting the workability of concrete.
   (b) Distinguish between segregation and bleeding of concrete

2. (a) Explain the various methods of measurement of workability of concrete..
   (b) Explain the various methods of mixing of concrete.

3. (a) Explain the influence of temperature and time on workability of concrete.
   (b) Explain the various methods of vibration of concrete.

4. (a) Explain the Setting times of concrete.
   (b) Explain Ready mixed concrete.

5. (a) List out various field and laboratory tests that are conducted to assess the properties of fresh concrete.

(b) Explain Compaction Factor test describing the test equipment. Compare the Compaction factor values to Slump of the concrete for different workability.

6. Discuss in detail the various stages of manufacture of concrete.

Unit-3 HARDENED CONCRETE

1. (a) Define curing and explain the various methods of curing of concrete.
(b) Explain the influence of water-cement ratio on the strength of concrete.

2. (a) Explain the various non-destructive testing methods of concrete.
(b) Explain the different methods of obtaining the tensile strength of concrete.

3. (a) Explain the method of obtaining the flexural strength of concrete.
(b) Explain the ultrasonic pulse velocity test for the evaluation of concrete.

4. (a) Explain the influence of gel-space ratio on the strength of concrete.
(b) Explain the maturity of concrete. Also describe its importance in the concrete construction industry.

5. (a) Explain the factors influencing the compressive strength of concrete.
(b) Explain the various codal provisions for Non-destructive testing methods of concrete.

6 (a) Explain Abrams water/cement ratio law and compare it with Gel/space ratio law.
(b) Calculate the gel space ratio and the theoretical strength of a sample of concrete made with 500 gm of cement with 0.40 water / cement ratio on full hydration and at 75% hydration.

Unit-4 ELATICITY CREEP &SHRINKAGE

1. (a) Explain the various elastic moduli of concrete.
(b) Explain the factors affecting the shrinkage and creep of concrete.

2. (a) Explain the static and dynamic moduli of elasticity of concrete.
(b) Explain the method of obtaining the dynamic modulus of elasticity of concrete.

3. (a) Draw the stress-strain curve for concrete and explain the method of determination the various elastic moduli of concrete.
(b) Explain creep and shrinkage of concrete and the factors influencing the creep of concrete.

4. (a) Explain the factors affecting the strength of hardened concrete.
(b) Estimate the strength of concrete at 21 days using maturity concept for M40 Grade cement cured at 120C for 4 hours and 180C for 8 hours and 210C for the rest of the period? Plowman's coefficients are A = 21 and B = 61.

5. (a) Explain the relation between modulus of elasticity and strength of concrete.
(b) Describe the creep of concrete and explain the variation of creep with time.

6. (a) Explain the factors affecting the creep and shrinkage of concrete.
(b) Explain Poission's ratio. How do you find the Poission's ratio of concrete?

Unit-5 MIXDESIGN

1. (a) Explain the various factors influencing the durability of concrete.
   (b) Explain the procedure for the mix design of M25 grade of concrete as per the Bureau of Indian standards method.

2. (a) Explain the factors influencing the mix proportions of concrete.
   (b) Explain the quality control of concrete and the acceptance criteria.

3. (a) Explain the statistical quality control of concrete.
   (b) Explain the various methods of proportioning of concrete mixes.

4. Design M 30 grade of concrete using the following data:
   Grade of cement: 53 Grade OPC
   Degree of quality control: Good
   Maximum size of aggregate: 20 mm
   Slump required: 75 mm
   Fineness modulus of coarse aggregate: 6.2
   Fineness modulus of fine aggregate: 3.2
   Density of coarse aggregate: 1500 kg/m3
   Density of fine aggregate: 1450 kg/m3
   Sand: Zone II
   Assume any other data suitably.

5. (a) What is the filed corrections to be carried out for concrete mixes? explain?
   (b) What are different variables in proportioning that influence mix design.

6. (a) Explain what is mix design and its practical necessity.
   (b) Explain the durability considerations in the design of concrete mixes as per IS 456-2000.

Unit-6 SPECIAL CONCRETES

1. Explain the following:
   (a) Self-consolidating concrete
   (b) Cellular concrete

2. Explain the following:
   (a) Explain the properties of polymer concrete.
   (b) High density concrete

3. (a) Explain the various types of fibres used in concrete
   (b) Explain the factors affecting properties of fibre reinforced concrete.

4. Explain the following:
   (i) Light weight aggregate concrete (ii) Types of Polymer concrete

5. Explain the following:
   (i) High performance concrete (ii) No-fines concrete

6. List out the concretes categorized as special concretes. What are the objectives of special concretes?

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DEPARTMENT OF CIVIL ENGINEERING

STRENGTH OF MATERIALS -II

QUESTION BANK

Faculty: P.LAVANYA **YEAR: II B.TECH / II SEM**

UNIT-I

1. Write about Principal stress theory. Discuss briefly the maximum principal stress theory.
2. What are the different Theories of Failures and Explain about Mohr's circle?
3. Explain about Normal and tangential stresses on an inclined plane, Show that the greatest shear strain is equal to greatest difference of principal strains
4. Derive an expression for the major and minor principal stresses on an oblique plane, when the body is subjected to direct stresses in two mutually perpendicular directions accompanied by a shear stress
5. Direct stresses of 120 N/mm^2 (tensile) and 90 N/mm2 (compressive) exist on two perpendicular planes at a certain point in a body. They are also accompanied by shear stress on the planes. The greatest principal stress at the point due to these is 150 N/mm$^{2.}$
   (i) What must be the magnitude of the shearing stresses on the two planes?
   (ii) What will be the maximum shearing stress at the point?
6. a)Derive an expression for the normal stress and shear stress on an oblique section of a
   rectangular body when it is subjected to direct stress in one plane only.

   b) A rectangular element is a strained body is subjected to tensile stresses of 250 N/mm^2
   and 180 N/mm2 on mutually perpendicular planes together with a shear stress of 80N/mm^2. Determine: i) Principal stresses ii) Principal planes
   iii) Maximum shear stress and iv) Plane of maximum shear stress

7. A circular shaft 100 mm diameter is subjected to combined bending and twisting of moments
   the B.M being 3 times the twisting moment. If the direct tensile yield point of the material is

350 N/mm^{2,} and the factor of safety is 4, calculate the allowable twisting moment according to the following theories of failures.

(i). maximum principle stress theory, (ii) shear strain energy theory, if the simple shear is not to exceed 60 N/mm^2.

8. An element is subjected to tensile stresses of 60 N/mm^2 and 20 N/mm^2 acting on two perpendicular planes and is also accompanied by shear stress of 20 N/mm^2 on these planes.

Draw the Mohr's circle of stresses and determine the magnitudes and directions of principal

stresses and also the greatest shear stress.

9. Write a note on Mohr's circle of stresses. What is the importance of this circle?

b) A rectangular block of 1200 mm^2 cross-sectional area is subjected to a longitudinal compressive load of 1200kN. Determine the normal stress across the cross section of the block. If the block is cut by an oblique plane making an angle of 40^0 with normal section of the block. Determine:

(i) Normal stress on the oblique plane

(ii) Tangential stress along the oblique plane, and

(iii) Resultant stress on the oblique plane.

UNIT-II

1. a) Write the assumptions made in the theory of torsion and a) (i)Derive the torsion equation from fundamentals T/J =q/r = N_/L with usual notation.(ii) Explain the Theory of pure torsion?

   b) A solid steel shaft has to transmit 75 kW at 200 r.p.m., taking allowable shear stress as 70N/mm^2. Find the diameter for the shaft, if maximum torque transmitted at each revolution exceeds the mean by 30%.
2. Write about Polar section modulus with one example and Write the different Types of springs Write about close and open coiled helical springs
3. A solid shaft is required to transmit 120 kW power at 200 r.p.m. Find the suitable diameter of the shaft if maximum torque transmitted in each revelation exceeds the mean by 20%.Take allowable shear stress as 70 N/mm^2.
4. A 450 kW of power has to transmit at 100 r.p.m. Find the suitable diameter of hollow circular section, the inside diameter being 3/4 of the external diameter. Take allowable shear stress as 70 N/mm^2.
5. a) Derive the maximum shear stress induced, in the wire of a closed-coiled helical spring which carries an axial load W. Assume mean radius of spring coil is R and diameter of spring wire is d.

   b) A leaf spring carries a central load of 3000 N. The leaf spring has to be made of 10 steel plates 5 cm wide and 6 mm thick, if the bending stress is limited to 150 N/mm^2. Determine: (i)length of the spring and (ii) deflection at the centre of the spring. Take E = 2x10^5 N/mm^2
6. A leaf spring carries a central load of 3000 N. The leaf spring has to be made of 10 steel plates 5cm wide and 6 mm thick. If the bending stress is limited to 150 N/mm2 determine: (i) length of the spring and (ii) deflection at the centre of the spring. Take E = 2x10^5 N/mm^2.
7. Define helical spring? Name the two important types of helical springs.

   b) A hollow shaft of diameter ratio 3/5 is required to transmit 400KW at 140 r.p.m with

uniform twisting moment. The shear stress in the shaft must not exceed 60 MPa a the twist in a length 2.5 m must not exceed 10. Calculate the minimum external diameter of the shaft. Take C=8X10^4 MPa

8. Closely coiled helical spring is made out of 10mm dia. steel rod, the coil having 12 complete turns. The mean dia. of spring is 10mm. Calculate the shear stress induced in the section of the rod due to an axial load of 250N. Find also the deflection under the load, energy stored in the spring and the stiffness of spring. Take N = 8 x104 N/mm^2.
9. Find the maximum torque that can be safely applied to a shaft of 200 mm diameter, if the permissible shear stress is 45 N/mm$^{2.}$

UNIT-III

1. What the different types of columns? What is the difference between short and long column?
2. Starting from secant formula, derive Perry's formula for long columns.
3. a)Derive the Rankine's formula for crippling load.

b) A column of circular section has 160mm diameter and 4m length. Both ends of the column are fixed. The column carries a load of 150kN at an eccentricity of 15mm from the geometrical axis of the column. Find the maximum compressive stress on the column section.

4. Write and explain about the limitations of Euler's Formula Calculate Euler's critical stress for the column having slenderness ratio 100,150 with both ends hinged. Take E = 2x10^5 N/mm^2.
5. A hollow rectangular column of external depth 1 m and external width 1 m is 10 cm thick. Calculate the maximum and minimum stress in the section of the column, if vertical load of 200 kN is acting with an eccentricity of 20 cm.
6. Deduce a formula for the critical load of a column having both ends hinged.

b) A solid circular bar 6m long and 5 cm in diameter was found to extend 4.5 mm under a tensile load of 50KN. The bar is used as a strut with both ends hinged. Determine the buckling load for the bar and the safe load, consider factor of safety as 3.0.

7. a)Define slenderness ratio of a column. What is its importance?

b) A column of circular section has 160mm diameter and 4m length. Both ends of the column are fixed. The column carries a load of 150kN at an eccentricity of 15mm from the geometrical axis of the column. Find the maximum compressive stress on the column section.

8. In an experimental determination of the buckling load for a rod 12 mm mild steel pin ended struts of various lengths, two of the values obtained were: (a) When the length is 50 cm load is 10 kN and

(b) When the length is 20 cm load is 30 kN. Make necessary calculations and state whether either of the values of the loads, confirm with Euler's formula for the critical load. Take E= 2x105 N/mm^2.

9. An I-section joist ISWB400 and 8 m long is used as a strut with both ends fixed, determine

Euler's crippling load. Give for the section Ixx = 23426.7 cm^4, Iyy= 1388.0 cm^4 and E =2x10^5 N/mm^2.

10. a) Derive Euler's buckling load formula of a long column pinned at both ends.

b) A solid round bar 3 m long and 5 cm in diameter is used as a strut with one end is fixed and

other is hinged. Determine the crippling load. Take E = $2x10^5$ N/mm^2.

11. A 1.5 m long column has a circular cross section of 5 cm diameter, one of the ends of the

column is fixed in direction and position, and the other end is free. Taking factory of safety as 3, calculate the safe load using: (i) Rankin's formula, take yield stress is 560 N/mm^2 and a= 1/1600 for pinned ends, (ii) Euler's formula, Young's Modulus for the material is $1.2x10^5$ N/mm^2.

UNIT-IV

1. Find core diameter of a solid section, if diameter is 'd'. Find core diameter of a hollow section, if external and internal diameter are 'D' and 'd'.
2. A beam carries a UDL of 50 kN/m over a span of 2 m long, with an axial compressive load of 50 kN. The beam section is rectangular, having depth equal to 240 mm and width equal to 120mm. Compute (i) maximum fibre stress, (ii) fibre stress at a point 0.5 m from the left end of thebeam and 80 mm below the N.A.
3. A hollow rectangular column of external depth 1 m and external width 1 m is 10 cm thick. Calculate the maximum and minimum stress in the section of the column if vertical load of 200 kN is acting with an eccentricity of 20 cm.
4. Explain about the term kernel and determine the size of kernel for a rectangular 200 mm x300. Find maximum eccentricity of the rectangular section (width b and depth d) for no tension in the section.
5. A short column of external diameter 40 cm and internal diameter 20 cm carries an eccentric load of 80kN. Find the greatest eccentricity which the load can have without producing tension on the cross –section.
6. A square chimney, 30 m high, has a flue opening of size 1.5 m x 1.5 m. Find the minimum width required at the base for no tension if the masonry weights 20 kN/m^3 and the wind pressure is 1.5 kN/m^2. The permissible stress in the masonry is 1kN/m^2.
7. Determine of stresses in the case of dams and explain the conditions for stability? Write the stresses in retaining walls?
8. Determine of stresses in the case of chimneys, retaining walls
9. Distinguish between direct stress and bending stress by means of a diagram.

UNIT-V

1. What is moment of inertia? Explain briefly about unsymmetrical bending? State the assumptions made in analyzing a beam for unsymmetrical bending.
2. Explain briefly how stresses in beams due to un symmetric bending is considered b) Explain briefly the method of locating shear centre.
3. What are the conditions that should be satisfied for a beam to bend without twisting? Explain about centroid in rectangular section.
4. A beam of rectangular section 100mm wide and 180mm deep is subjected to a bending moment of 12kN.m The trace of the plane of loading is inclined at 45^0 to the y-y axis of the section. Locate the natural axis of the section and calculate the maximum bending stress induced is the section.
5. A beam of rectangular section 80mm wide and 120mm deep is subjected to a bending moment of 12kN.m The trace of the plane of loading is inclined at 45^0 to the y-y axis of the

section. Locate the neutral axis of the section and calculate the maximum bending stress induced is the section.

6. Determine the principal moments of Inertia for an angle section 225x175x15 mm.
7. A rectangular section of dimensions 120 x 200 mm is used as a beam on a 3 m span, If the beam is loaded by a concentrated load (P) at the centre at 30^{o} to the vertical (Y-Y axis). Find the maximum value of the load 'P' in kN, if the maximum bending stress is not to exceed 12MPa.
8. A T-Section of dimensions 150 wide x 200 mm deep, with 10 mm thickness of flange and web, is used as simply supported a beam on a span of 6 m. Find the maximum value of 'w' in kN/m, the permissible stress in the material is 120 MPa. The plane of loading is inclined at an angle of 40_{0} to the vertical plane.

UNIT-VI

1. Explain the concept of determinate trusses and indeterminate trusses
2. Explain the procedure for tension coefficient method in statically determinate frame.
3. Explain the procedure for method of sections in statically determinate frame.
4. cantilever truss is loaded as shown in Figure 1. Analyze the truss by method of joints.
5. cantilever truss is loaded as shown in Figure 1. Analyze the truss by method of sections.

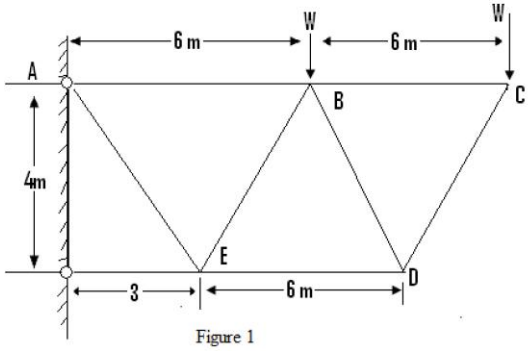


Figure 1

6. Write a note on method of joint? Determine the forces in the members of equilateral triangle truss of span 'L' loaded with apoint load 'W'.

7. Determine the member forces of the truss shown in Figure 1, using method of joints.

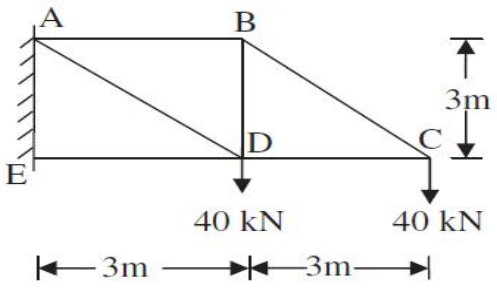
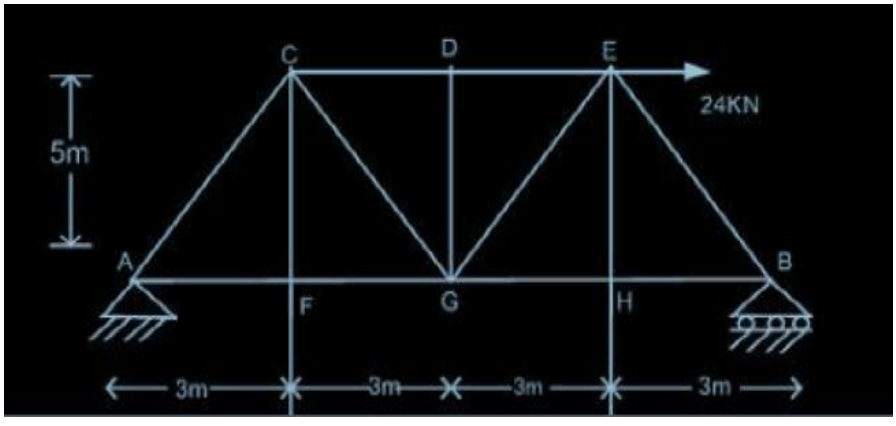


Figure 1

8. Determine the forces in all the members of the frame by method of joints.



9. Find the forces in the members of truss by method of joints as shown in Figure 1.

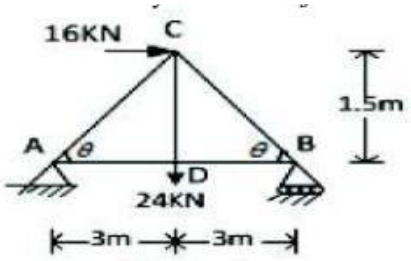


Figure 1

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QUESTION BANK (Academic Year 2018-19)
STRUCTURAL ANALYSIS - I
K.SANTHOSH, Assistant *Professor*
II Year B-TECH– II Semester **Branch: Civil Engineering** **Regulation: R-16**

UNIT-I

1.a. What do you understand by the term prop? ----------2M

b. Derive an expression for the prop reaction in a cantilever carrying a u.d.l over the entire span and propped at the free end.----------8M

2. Draw the bending moment and shear force diagram of a propped cantilever beam of span 6m due to a point load of 6 kN at the mid span.----------10M

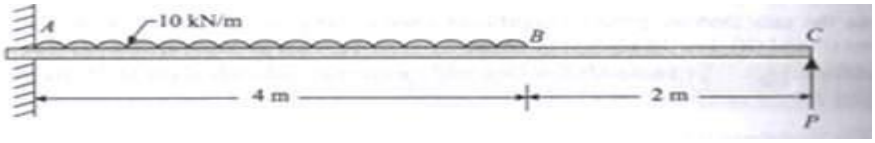
3. a. Define sinking of prop. How does it differ from a rigid prop?----------2M

b. A cantilever of length l carries a point load W at its free end. It is popped at a distance of l/4 from the free end. Find out the prop reaction.----------8M

4.a Differentiate between cantilever and propped cantilever.----------2M

b. A cantilever of length 'L' carries a concentrated load 'W' at its mid-span. If the free end is supported by a prop, find the reaction at the prop and also draw the S.F. and B.M. diagrams.----------8M

5. A cantilever ABC is fixed at A and propped at C is loaded as shown in the figure. Find the reaction at C. ----------10M



6. A propped cantilever beam AB of span 8m is carrying a U.D.L of 4kN/m for a length of 6m from the left end and point load of 10kN at 2m from the right end. Calculate the prop Reaction and also draw the BM & SF diagrams.----------10M

7. A cantilever of length 6m carries a u.d.l of 2 KN/m over a length of 4m starting from the fixed end. The cantilever is propped rigidly at the free end. If the value of E=2x105 N/mm2 and I=108 mm4 then determine: a) Reaction at the rigid drop, b) The deflection at the centre of the cantilever and c) Magnitude and position of maximum deflection.----------10M

UNIT-II

1.a. Find the moment at the left hand support, if a fixed beam of span 'L' is sunk by an amount 'Δ' at the right hand support.----------3M

b. A fixed beam of span 6 m is subjected a UDL of 5 kN/m on the left half of the span and a point load of 15 kN at the middle of the right half of the span. Draw the S.F. and B.M. diagrams.7M

2.a. A fixed beam of span 6 m is subjected a UDL of 5 kN/m over the entire span. Find the net moment at the center of span.----------3M

b. A fixed beam of span 8 m is subjected to a linearly varying load of 8 kN/m from one support to 6kN/m to the other support. Find the support reactions and moments. Draw the shear force and bending moment diagrams.----------7M

3. a. A fixed beam of span 6 m is subjected to a point load of 5 kN at the one-third of span from the left end. Find the moments at the supports.----------2M

b. A fixed beam of 6 m span carries a uniformly distributed load of 12 kN/m run over the whole span. The level of right hand support sinks by 8 mm below that the left hand end. Take E=2.10x108kN/m2 and I=4.50x10-5 m4. Find (i) Support moments, (ii) Support reactions, and (iii) Deflection at the centre. ----------8M

4. A fixed beam AB of length 8m carrying a U.D.L of 20kN/m on whole span with a point load of 40kN on centre of the span, analyze the beam and draw the SF and BM diagram----10M

5.a. If a fixed beam AB carries an eccentric load P, what is the value of maximum deflection?--2M

b. A fixed beam AB of span 6m is subjected to two point loads of 20kN and 15kN at a distance of 2m and 4m from A. Calculate the fixing moments at A and B.----------8M

6. a. Draw the bending moment diagram for eccentrically point loaded on fixed beam.--------2M

b. A fixed beam AB of span 6m is carrying a uniformly distributed load of 4kN/m over the left half span. Find the fixing moments and support reactions.----------8M

7.a. What are the advantages of fixed beams?----------2M

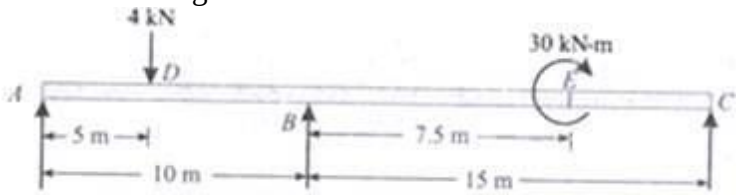
b. A fixed beam AB of 3m span is subjected to a point load of 15kN at a distance of span. Find the fixing moments and deflection of the beam under the load. Take EI = 2 x 103kN-m2-------8M

UNIT-III

1.a. State Claypeyron's Three Moment theorem.----------2M

b. Derive the theorem of three moments----------8M

2.A continuous beam ABC of constant moment of inertia is simply supported at A .The beam carries a central point load of 4kN and clockwise central couple of moment 30kN-m in span BC as shown in the figure.----------10M

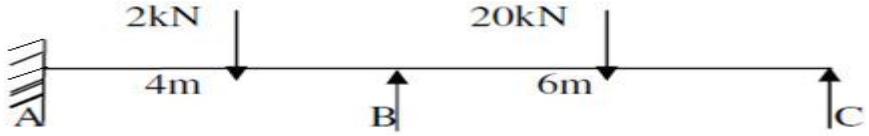


3.a What is a continuous beam? Explain with figure.----------2M

b. How can you apply the theorem of three moments for a fixed beam?Discuss with example 8M

4. A continuous beam ABC consists of spans AB and BC of lengths 4m and 6m respectively, the ends A and B being fixed. C is a free end. The span AB carries a uniformly distributed load of 24 kN/m while the span BC carries a point load of 108 kN at a distance of 2m from C. Find the support moments and support reactions----------10M

5. Analyze the continuous beam shown in below Figure. Use three-moment equation. Draw S.F and B.M diagrams.----------10M



6. Four point loads 100, 120, 150 and 80 KN spaced equally 2 m apart crosses a girder of 25 m span from left to right with 100 KN load leading. Calculate the maximum BM at a section 5 m from the left hand support and absolute max BM.----------10M

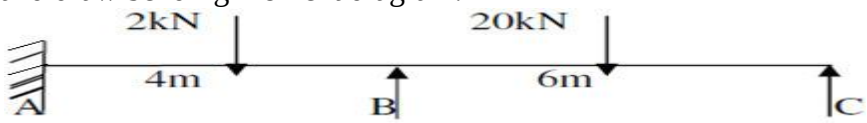
7. A continuous beam ABC consists of two spans AB of length 4m, and BC of length 3m. The span AB carries a point load of 100 KN at its middle points. The span BC carries a point load of 120 KN at 1m from C. The end A is fixed and the end C is simply supported. Find The moments at the supports, The reactions at the supports and Draw the B.M diagram by using Clapeyron's theorem of three moments. ----------10M

8. Analyze the continuous beam ABCD whose having AB length is 4m which is a carrying a point load 15kN at centre, with BC of span 6m and carrying a UDL of 4kN/m, with CD of span 4m carrying a 6kN/m with moment of inertias 3I, 4I and 3I, using three-moment equation. Draw S.F and B.M diagrams.- ----------10M

UNIT-IV

1.a. Write the expression MAB in terms of fixed moments, slopes θA, θB and settlement Δ.---2M

b. Analyze the continuous beam shown in below Figure. by Slope-Deflection method and draw bending moment diagram.----------8M



2. a. Write the formula for slope for a cantilever beam with point load at end----------2M

b. A continuous beam ABC consists of spans AB and BC of lengths 4m and 6m respectively, the ends A and B being fixed. C is a free end. The span AB carries a uniformly distributed load of 24 kN/m while the span BC carries a point load of 108 kN at a distance of 2m from C. Find the support moments and support reactions----------8M

3. A simply supported beam ABC is continuous over two pans AB and BC of 8m and 6m respectively. The span AB is carrying a uniformly distributed load of 20kN/m and span BC is carrying a point load of 60kN at a distance of 2m from B. Find the support moment at B. Also draw the bending moment diagram. Use slope deflection method. ---------- 10M

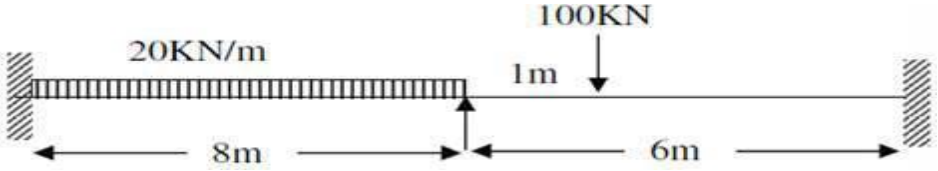
4. a. Explain the terms Static Indeterminacy, Kinematic Indeterminacy and Degree if Indeterminacy.

b. A continuous beam is built in at A and it is carried over rollers at B and C with spans of AB and BC being 10m. The beam carries a uniformly distributed load of 7.5KN/m over AB and a point load of50KN over BC 2.5m from the support B, which sinks by 20mm. Values of E and I are 2 * 105N/mm2 and 2 *109mm4. Calculate the support moments and draw bending moment diagram giving critical values. Use Slope deflection method. ----------8M

5. A Continuous beam is fixed at A and is supported over rollers at B and C. AB=BC=12M.The beam carries a uniformly distributed load of 30kN/m over AB and a point load of 240kN at a distance of 4M from B on span BC.B has an settlement of 30mm.E= 2 x105 N/mm2, I=2x10^9mm4. Analyse the beam by slope deflection method. ----------10M

6.a. Give two examples each of Statically Indeterminate and Kinematic Indeterminate structures. Calculate degree of indeterminacy in each of the cases. ----------2M

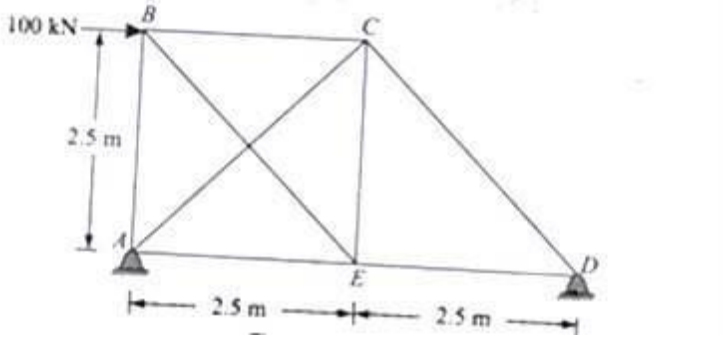
b. Evaluate the bending moment and shear force diagrams of beam in below figure by slope deflection method. ----------8M



7. a. Write the expression MAB in terms of fixed moments, slopes θA, θB and settlement Δ.- 2M
b. A continuous beam ABC is fixed at A and simply supported at B and C. The span AB is 6m and carries a uniformly distributed load of 10 kN/m. The span BC is 4m and carries uniformly distributed load of 30 kN/m. Determine the fixed end moments by Slope Deflection method. -8M

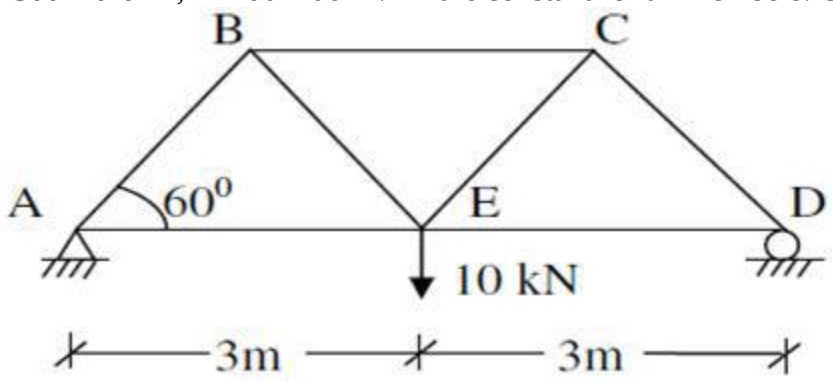
UNIT-V

1. a. Derive the expression of strain energy due to axial loading. ----------2M
b. Determine the forces in the members AC and BE of a pin jointed truss shown n the figure. Assume cross sectional area of each member to be 15 x 10-4 m^2.



2. a. Draw bending moment diagram for simply supported beam with point load at centre---2M
b. Define Strain energy. Derive an expression for strain energy due to bending moment. -----8M

3. a. Write the expression of strain energy due to axial load? ----------2M
b. Determine the vertical deflection of Joint 'C' for the truss shown in below Figure. Take A=500x10-6m2, E=200x106kN/m2 are constant for all members. Use strain energy method.



4. a. Derive the expression for strain energy of a straight prismatic bar of length L and crosssectional area A, if it is subjected to a bending M.----------3M
b. Discuss the Maxwell's theorem for redundant frames----------7M

5.a State Castigliano's first theorem.----------2M
b. Derive Castigliano's first theorem with an example----------8M

UNIT-VI

1.a Define the term opposite joint. What important rule does it play in drawing the influence line diagram? ----------2M
b. Describe the procedure for drawing the influence lines for the forces in the vertical and diagonal members of a truss? How does it differ from the bottom chord horizontal members?-8M

2. a. What do you understand by the word rolling loads? ----------2M
b. State the position of a uniformly distributed load for a maximum bending moment and shear force when it crosses girder of smaller than that of load. ----------8M

3. a. Define influence line ----------2M
b. A girder of span 16m is subjected to a dead load of 30kN/m .Calculate the portion of the girder for which shear force changes sign, when an equivalent distributed load of 60 kN/m crosses the girder.----------8M

4. Draw the influence line diagram for B.M at a point 8m from the left abutment on a bridge girder of span 30m and find the maximum B.M at that point due to a series of wheel loads 80kN, 160kN, 160kN and 160kN at centre to centre distances of 4m, 2.5m, 2.5m and 2.5m respectively. The loads can cross in either directions with the 80kN load leading. ----------10M

5. a. What is the condition for absolute maximum bending moment due to moving UDL longer than the span? ----------2M
b. A uniformly distributed load of 25kN/m and 20m long crosses a girder of span 12m. Calculate the Maximum Shear force and Bending Moment at 0m, 3m, 6m, 9m from the left end support and construct Diagrams ----------8M

6. a. Construct influence line for a shear at a section x of a simple beam of span L.--------2M
b. Four point loads 100, 120, 150 and 80 KN spaced equally 2 m apart crosses a girder of 25 m span from left to right with 100 KN load leading. Calculate the maximum BM at a section 5 m from the left hand support and absolute max BM. ----------8M
7. a. Determine the bending moment at a section 1.5 m in a simple beam of span 4 m, when a point load of 15 kN rolls across the beam. ----------2M
b. Two wheel loads of 16 and 8 kN at a fixed distance of 2 m, cross a beam of 10 m span. Draw the Influence Line for B.M and S.F for a point 4 m from left support, and find the max. B.M and S.F at that point. ----------8M

8. a. Determine the maximum positive shear force at a section 1.5 m in a simple beam of span 4m, when a point load of 15 kN rolls across the beam. ----------2M
b. Two point loads of 8 kN and 4 kN spaced 3 m apart cross a girder of 15 m span, the smaller load leading from left to right. Construct the maximum S.F. and B.M. diagrams, stating the positive and amount of absolute maximum bending moment.----------8M

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NAME: B.RAMYA DEPARTMENT: CIVIL

DISSIGNATION: ASSISTANT PROFESSOR YEAR/SEM:II/II

NAME OF THE SUBJECT : **TRANSPORTATION ENGINEERING - I**

REGULATION **:** **R16**

COURSE **:** **B.TECH**

BRANCH **:** **CIVIL**

YEAR / SEMESTER **:** **IIIRD YEAR – IST SEM**

FACULTY **:** **B.RAMYA**

FACULTY **H.O.D,CIVIL**

PRINCIPAL

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NAME: B.RAMYA DEPARTMENT: CIVIL

DISSIGNATION: ASSISTANT PROFESSOR YEAR/SEM:II/II

UNIT-I

1. Briefly outline the highway development in India.
2. Explain the necessity and objectives of highway planning?
3. What are the factors affecting the highway alignment.
4. What are the different Road Development Plans in India? Discuss them in detail
5. Explain the engineering surveys needed for a highway project and data to be collected.
6. What is the importance of Nagpur road plan in highway planning of our country? Explain the plan formulae and the salient features of the plan
7. Explain obligatory points? What are the uses of map study in engineering surveys?
8. What are the different road network patterns? Explain them in detail with neat sketches.

UNIT – II

1.Explain the summit and valley curves and the various cases when these are formed while two different gradients meet.
2.Explain in detail about highway cross section elements?
3.Discuss about transition curves and extra widening?
4.Define can't?Design superelevation for flexible pavements?
5.The design speed of a highway is 90 Kmph. There is a horizontal curve of radius 190 m on a certain locality. Calculate the super-elevation needed to maintain this speed. If the maximum super-elevation of 0.07 is not to be exceeded, calculate the maximum allowable speed on this horizontal curve as it is not possible to increase the radius. Safe limit of transverse coefficient of friction is 0.15.
6. Explain the ruling, maximum and exceptional gradients.
7. The speed of overtaking and overtaken vehicles are 90 Kmph and 45 Kmph respectively on a two way traffic road. If the time taken by the overtaking vehicle is equal to 7.5 seconds and reaction time of the driver is equal to 2 seconds, calculate the safe overtaking sight distance.
8. What are the objects of highway geometric design? List the various geometric elements to be considered in highway design.
9. Derive an expression for finding the extra widening required on horizontal curve.
10.Discuss about vertical curves with neat sketches and formulaes?

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NAME: B.RAMYA DEPARTMENT: CIVIL

DISSIGNATION: ASSISTANT PROFESSOR YEAR/SEM:II/II

UNIT – III

1. What are the objectives and uses of volume study.
2. What are the various types of traffic accidents and explain the various measures to prevent accidents.
3. Explain briefly the various aspects investigated during parking studies. What are the uses of these studies?
4. What a detailed note on road accidents and its preventive measures
5. Write in details about the traffic counting.
6. Write the various IRC equivalent factors of vehicles for Rural roads.
7. What are the objectives and uses of volume study.
8. How are the traffic signal times decided based on Webster's Method.
9. Explain the design steps involved in Rotary intersection.
10. Explain at grade intersections, the advantages and limitations.
11. Write a short note on speed studies? And discuss about spot speed and speed &delay studies?

UNIT – IV

1. What are the tests for aggregate used in highway. Explain them in brief?
2. What are the various tests conducted on bitumen.Explain them in brief?
3. Explain the plate bearing test procedure and how corrections for 'K' value may be made for a different plate size and for accounting for worst moisture conditions
4. Discuss the desirable properties of the bitumen. Compare tar and bitumen.
5. The properties of a subgrade soil are given below
   Liquid limit = 75 %
   Plastic limit = 55 %
   Passing No. 200 sieve = 70 %
   (i) Determine the group index and classify the soil by HRB soil classification system.
   (ii) Determine the suitability of the soil as a subgrade material.
6. What are the desirable properties of the bitumen mixes? What are the steps on

bituminous mix design? Discuss briefly?

7. Explain the CBR and the test procedure for the laboratory and field tests. How are the results of the test obtained and interpreted?

UNIT – V

1.The CBR value of soil is 5 %. Calculate the total thickness of flexible pavement using design charts developed by IRC.

2.Estimate the thickness of concrete using the method suggested by Indian road congress.
Modulus of elasticity of concrete = 3.0×10^5 kg/cm^2
Modulus of rupture of concrete = 40 kg/cm^2
Poisson's ratio of concrete = 0.15
Modulus of subgrade reaction = 6 kg/cm^2
Wheel load = 5100 kg
Radius of contact pressure = 15 cm

3. Explain the critical wheel load locations considered in Westergaard's theory? Write the significance of each location in the analysis of load stresses?

4.Explain in detail about the CBR and IRC methods for flexible pavements.

5.Explain and discuss about the various streeses in rigid pavements.

6. What are roller compacted roads ?Explain about joints in rigid pavements

7.Write BURMISTER method for flexible pavements.

UNIT – VI

1. Compare the alternate bay and continuous bay methods construction of cement concrete roads

2.Discuss about mainteinence for flexible and rigid pavements?

2. What are the advantages and drawbacks of flexible roads? Explain about the construction procedure?

4. List out the different methods of road construction. Discuss their advantages and limitations.

5. Specify the materials required for construction of WBM roads. What are the uses and limitations of this type of road?

6. Compare the fallowing methods of bituminous road construction
(i) Central plant mix and road mix methods
(ii) Hot mix and cold mix.