[B16 ENG 2101]

II/IV B.Tech. DEGREE EXAMINATION

First Semester.

MATHEMATICS-IV

MODEL QUESTION PAPER

(Common to CIV, ECE, EEE & ME)

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks
All parts of a question must be answered at one place only

1 (a) Find a unit vector normal to the surface $x^3 + y^3 + 3xyz = 3$ at the point $(1, 2, -1)$.

(b) Show that $Curl\,(grad\,\phi) = 0$.

(c) Show that $\iint_S \nabla r^2 \cdot d\bar{s} = 6V$.

(d) State two-dimensional Laplace equation in Cartesian coordinates. Define harmonic function.

(e) Find the analytic function whose real part is $x^3 - 3xy^2$.

(f) Evaluate $\oint_C \frac{z^2 - z + 1}{(z-2)} dz$ where C is the circle $|z| = 1$.

(g) Find the nature and location of the singularities of the function $\frac{1}{(z-1)^3}$.

2 (a) Find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point $P(1,2,3)$ in the direction of the line PQ where Q is the point $(5,0,4)$. Also calculate the magnitude of the maximum directional derivative.

(b) Prove that $\nabla^2 f(r) = f''(r) + \frac{2}{r} f'(r)$.

3(a) Show that $\bar{F} = (2xy + z^3)\bar{i} + x^2\bar{j} + 3xz^2\bar{k}$ is a conservative field. Find the potential function and hence the work done in moving a particle in this field from $(1,-2,1)$ to $(3,1,4)$.

(b) Use Green's theorem to evaluate $\oint_C [(3x - 8y^2)dx + (4y - 6xy)dy]$ where C is the boundary of the region described by $x = 0,\ y = 0\ and\ x + y = 1$

4 (a) Evaluate $\iiint_v div\ \bar{F}\, dv$ where $\bar{F} = y\bar{i} + x\bar{j} + z^2\bar{k}$ over the cylindrical region bounded by $x^2 + y^2 = 9,\ z = 0$ and $z = 2$.

(b) Find components of the vector field $z\bar{i} - z\bar{j} + y\bar{k}$ in cylindrical polar coordinates.

5 (a) Solve the equation $p\,y^3 + q\,x^2 = 0$ by the method of separation of variables.

(b) A tightly stretched string with fixed end points $x = 0$ and $x = l$ is initially at rest in its equilibrium position. If it is set vibrating by giving to each of its points a velocity $\lambda x(l - x)$, find the displacement of the string at any distance x from one end at any time t.

6 (a) If $f(z)$ is a regular function of z, prove that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} \right) |f(z)|^2 = 4|f'(z)|^2$.

(b) Find the bi-linear transformation which maps the points $z = 1, -1, \infty$ of the z-plane onto the points $w = 1 + i, 1 - i, 1$ of the w-plane. Hence find the critical points and the invariant points of this transformation.

7(a) Evaluate $\oint_C \frac{z^3 + z + 1}{z^2 - 7z + 2} dz$, where C is the ellipse $4x^2 + 9y^2 = 1$.

(b) Find the Laurent's expansion of the function $f(z) = \frac{1}{(1 - z)(2 - z)}$ valid for

(i) $0 < |z - 2| < 1$ (ii) $|z - 1| > 1$.

8 (a) Evaluate $\int_c \tan z \, dz$ where C is the circle $|z| = 2$.

(b) Use calculus of residues to evaluate $\int_0^{2\pi} \frac{Cos\, 3\theta}{5 - 4\, Cos\, \theta} d\theta$.

[B16 CE 2101]

II/IV B.Tech. DEGREE EXAMINATION

First Semester

ENGINEERING MECHANICS

MODEL QUESTION PAPER

CIVIL Engineering

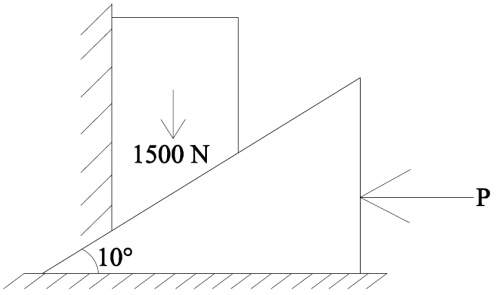
Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

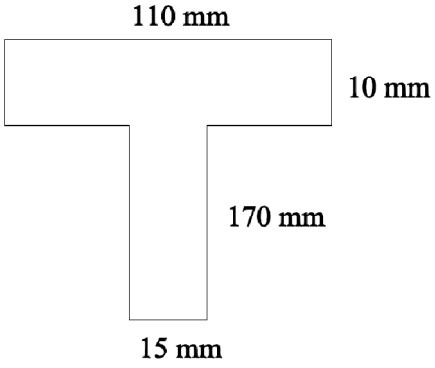
All parts of a question must be answered at one place onl2

1 a) state Varignon's theorem
b) What is the difference between collinear and concurrent forces?
c) What is product of inertia?
d) State theorem of Pappus?
e) Explain law of conservation of energy.
f) Define velocity of projection, angle of projection and time of flight.
g) What is direct impact?

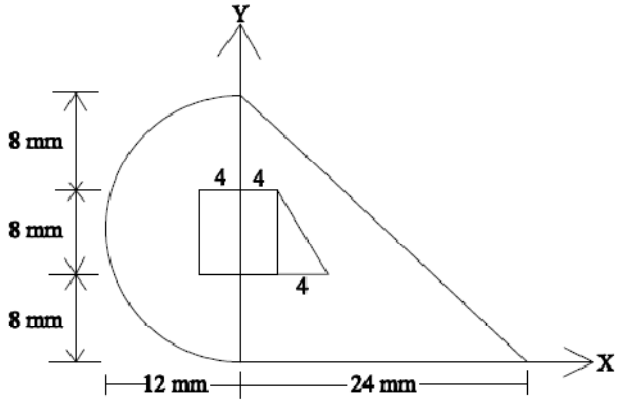
2 a) state and prove parallel axis theorem.
b) A block over lying a 10^0 wedge on a horizontal floor and leaning against a vertical wall and weighing 1500N is to be raised by applying a horizontal force to the wedge. Assuming co-efficient of friction between all the surfaces in contact to be 0.3, determine the min horizontal force to be applied to raise the block, referring to the figure below.



3 a) Determine the moment of inertia for the plane area about its centroidal x-axes.

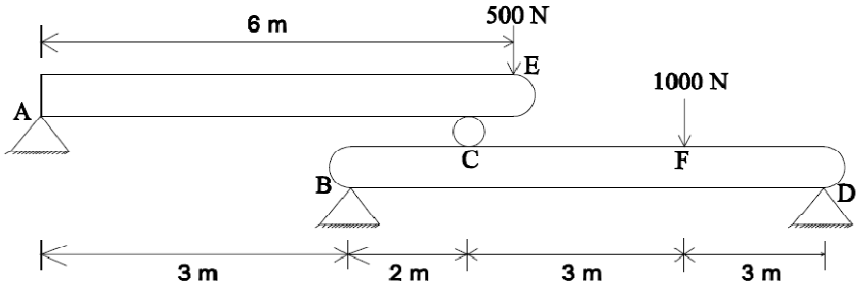


b) Determine the Centroid of the shaded area as shown in fig with respect to x and y axes. All dimensions are in mm.

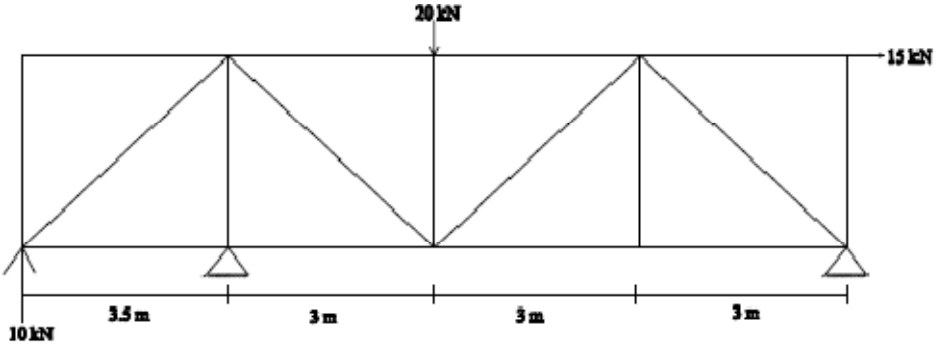


4 a) State and explain principle of virtual work.

b) Using the principle of virtual work, find the reactions at rollers 'C' and 'B' of the assembly loaded as shown in fig.



5) Determine the forces in the members of the truss shown in fig. Height of the truss 4m.



6 a) a bullet is fired at 125m/s from a point A and has to hit a target at a horizontal distance of 1000m from A and situated 200m higher than A Find

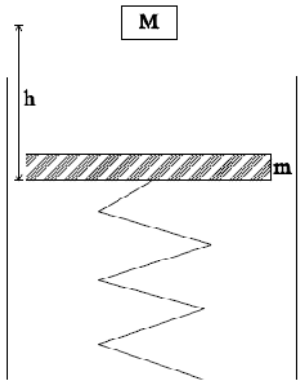
i) The angle α at which the bullet must be fired in order to strike the target in the minimum time,

ii) The maximum height above A reached by the bullet.

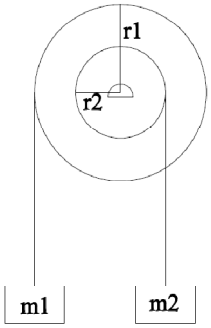
iii) The time of flight.

b) a body of mass 8kg moving with a velocity of 10m/s collides with another body of mass 3 kg moving with 5m/s in opposite direction. Find the velocities of the individual bodies after impact if the coefficient of restriction is 0.9

7 a) A block weighing M=27Kg is dropped on the pan of a spring scale, shown in fig. The height of drop h=1.7m and weight of scale pan m=7kg.assuming a perfectly plastic impact, determine the max amount of deflection of the spring where spring constant K=20N/mm.



b) Consider the inertial and the frictional effect absent in the pulley system . Determine the downward acceleration of mass m_1 as shown in fig take m_1=8kg, m_2=12kg, r_1=2r_2=20cm.



8a) State and prove work energy principle.

b) What is instantaneous centre of rotation? Show that for a ladder sliding along two mutually perpendicular walls, the instantaneous centre takes the path of a circle.

[B16 CE 2101]

[B16 CE 2102]

II/IV B.Tech. DEGREE EXAMINATION

First Semester

MECHANICS OF SOLIDS

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks:70**

Question No. 1 compulsory.

Answer any FOUR questions from the remaining.

All Questions Carry equal marks

All parts of a question must be answered at one place only

1.

(a) State Hook's law with suitable example.
(b) Define Poisson's ratio and factor of safety.
(c) Discuss the sign conventions for shear force and bending moments used in beams.
(d) Define point of contraflexure.
(e) List the assumptions made in the theory of simple bending.
(f) Define the term pure torsion with suitable examples.
(g) What is meant by crippling load and slenderness ratio?

2. (a) Draw the stress- strain diagram for Mild Steel and discuss the salient features.

(b) A rod of steel is 5 m long and 30mm diameter at a temperature of 28ºC. Find the free expansion of the rod when temperature is raised to 75º. Determine the stress and pull exerted if the ends do not yield. E = 2 x 10^5 N/mm^2, α = 12 x 10^{-6} /ºC.

3. A simply supported beam has a span of 10 m and carry the loadings shown in fig 1. Draw S.F and B.M diagrams indicating salient values. Find the position and magnitude of the maximum BM in the beam.

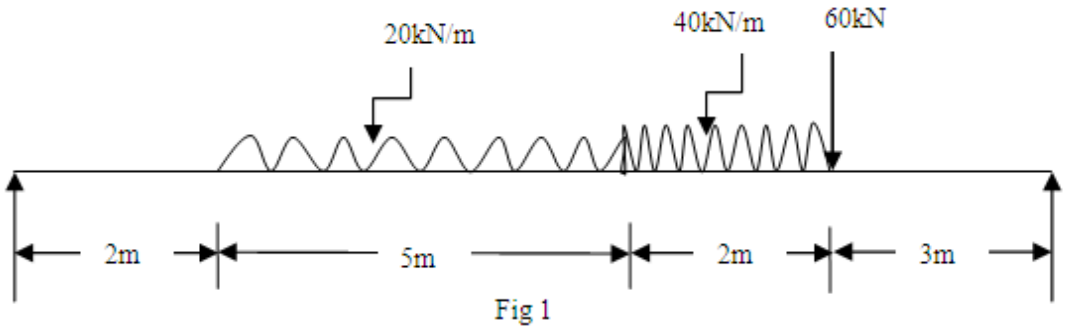


Fig 1

4. (a) Find an expression for section modulus for a circular and hollow circular sections.

(b) Derive the relation $\frac{M}{I} = \frac{f}{y} = \frac{E}{R}$ for a beam

5. (a) A simply supported beam of span L is subjected to equal loads W/2 each at 1/3rd span points. Find the expressions for deflection under the load and at the mid span. Use Macaulay's method

(b) Distinguish between Double integration method and Macaulay's method

6. (a) 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

(b) At a point within a body subjected to two mutually perpendicular directions, the stresses are 150N/mm^2 (tensile) and 100 N/mm^2 (compression). Each of the above stresses, is accompanied by a shear stress of 100 N/mm^2. Determine the normal, shear and resultant stresses on an oblique plane inclined at an angle of 45º with the axis of minor tensile stress.

7. (a)Find the maximum power transmitted by a shaft at 200 rpm without exceeding the permissible stress of 100 MPa if the shaft is (i) a solid circular shaft of diameter 60mm and (ii) a hollow shaft of the same internal diameter and has the same weight as the solid shaft.

(b) A closed coil helical spring is made with 12mm diameter wire and is having mean diameter of 150mm and 10 complete turns. The modulus of rigidity of the material of spring is 80 kN/mm^2. Find (i) Maximum shear stress, (ii) Strain energy stored, (iii) Deflection produced, and (iv) Stiffness of the spring.

8. A hollow cast from iron whose outside diameter is 200mm and has a thickness of 20mm is 4.5m long and is fixed at both ends. Calculate the safe load by Rankine's formulae using a factor of safety of 2.5. Find the ratio of Euler's to Rankine's loads. Take E = 1 x 10^5 N/mm^2 and Rankine's constant = 1/1600 case and f_c = 550 N/mm^2.

[B16 CE 2102]

[B16 CE 2103]

II/IV B.Tech. DEGREE EXAMINATION

First Semester

FLUID MECHANICS –I

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1.

a. Distinguish real fluid – ideal fluid
b. State the difference in working principle of Manometers and Mechanical gauges.
c. Differentiate among stable, unstable and neutral equilibrium.
d. Define Steady flow and Non uniform flow.
e. State impulse momentum equation. what is its advantage over Bernoulli's equation?
f. Differentiate between Small and Large orifice .
g. List the various losses in flow through pipes.

2.

a. What are the physical properties of a fluid? Explain their practical significance.

b. An oil of viscosity 5.0 poise is used for lubrication between a shaft and sleeve. The diameter of the shaft is 0.5 m and it rotates at 200 rpm. Calculate the power lost in oil for a sleeve length of 100mm. The thickness of the oil film is 1.0 mm.

3. (a) How do you determine the hydrostatic force acting on a submerged curved surface?

(b) A circular plate 1.5 m diameter is submerged in, water, with its greatest and least depths below the surface being 2 m and 0.75 m respectively. Determine

(i) The total pressure on one face of the plate and

(ii) The position of the centre of pressure

4. (a) Differentiate between convective and local acceleration.

(b) The streamlines are represented by

(i) $\psi = x^2 - y^2$

(ii) $\psi = x^2 + y^2$

(1) Determine the velocity and its direction at (2,2).

(2) Sketch the streamlines and show the direction of flow in each case

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5. (a) Derive Bernoulli's equation for flow along a stream line. Explain the practical application of Bernoulli's equation.

(b) A horizontal venturimeter with inlet diameter 200 mm and throat diameter 100 mm is employed in horizontal pipe to measure the flow of water. The reading of the differential manometer connected to the inlet is 180 mm of mercury. If the coefficient of discharge is 0.98, determine the rate of flow.

6. (a) What are the advantages of a triangular notch over a rectangular notch? What is velocity of approach?

(b) A 3m high tank Standing on the ground is kept full of water. There is a small orifice in its vertical side with its centre at depth h meters below the free surface of liquid in the tank. Find the value of h so that liquid strikes the ground at the maximum distance from the tank. Assuming a = 0.97, calculate the maximum value of the horizontal distance.

7. (a) Derive an expression for the force exerted by a Jet water on moving inclined plate in the direction of Jet.

(b) In a 45° bend a rectangular air duct of 1 m^2 cross sectional area is gradually reduced to 0.5 m^2 area. Find the magnitude and direction of force required to hold the duct in Position if the velocity of flow at 1 m^2 section is 10 m/s and pressure is 30 KN/m^2.Take the specific weight of air as 0.0116 KN/m^3.

8. (a)Explain Hardy-Cross method of analysis.

(b) A pipeline of 600 mm diameter is I. long. To increase the discharge another of the same diameter is introduced parallel to the first in the second half of the length If f = 0.01 and head at inlet is 300 mm, calculate the increase in discharge.

[B16 CE 2103]

[B16 CE 2104]

II/IV B.Tech. DEGREE EXAMINATION

First Semester

SURVEYING

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1. Write short answers for the following: (1X14=14M)
   a. What is the Dip of a magnetic needle in compass?
   b. Distinguish between accuracy and precision.
   c. Differentiate between base line and check line.
   d. What is a well-conditioned triangle?
   e. What is profile levelling?
   f. What is meant by traverse surveying?
   g. What is the use of Ceylon Ghat tracer?
   h. What is the basic principle of surveying?
   i. What do you mean by line of collimation?
   j. The true bearing of a line AB is $220^0 45'$ what will be its magnetic bearing if the declination is $8^0 15'$.
   k. Distinguish between isogonic lines and agonic lines.
   l. What is parallax? How can you eliminate it?
   m. State the limitations of plane table survey.
   n. What are the uses of a optical square?
2. A.) What are the various errors of chaining? Mention whether they are cumulative or compensating.

   B.) A steel tape 30 m long at a temperature of 70^0 F when lying horizontally on the ground. Its sectional area is 0.8 cm^2, weight 1.5 kg and $\alpha = 60 \times 10^7$ /F. The tape is structured over three spans. Calculate the actual length under the following conditions. Temperature 800F, Pull 5 kg. Take E = 2.108 x 106 kg/cm2.
3. A.) What is meant by local attraction? How are the observed bearings corrected for local attractions?

   B.) Calculate the interior angles of the following traverse and exercise the geometric check.

Line	**Fore Bearing**
AB	$70^0 30'$
BC	$132^0 00'$
CD	$56^0 00'$
DE	$215^0 30'$
EA	$310^0 30'$

4. A.) Explain the following terms with reference to a compass survey.
   i) Magnetic Meridian and True Meridian
   ii) Whole circle bearing and reduced bearing

   B.) The following are the bearings taken in running a compass traverse.

Line	Fore Bearing	Back Bearing
AB	$66^0 15'$	$244^0 00'$
BC	$129^0 45'$	$313^0 00'$
CD	$218^0 30'$	$37^0 30'$
DA	$300^0 45'$	$126^0 45'$

   Determine the corrected as well as true bearings if the magnetic declination was 1^0 40' E.

5. A.) List the typical characteristics of contours. Explain the various indirect methods of contouring.
   B.) The following reciprocal levels were taken with one level.

Instrument at	Reading on		Remarks
	A	B	
A	1.564	2.868	Distance AB = 100m
B	0.536	1.732	RL at A = 190.85

   Determine:
   i.) True difference in elevation between A and B
   ii.) The RL of B
   iii.) The Collimation error.

6. A.) Enumerate the various methods of plane table. Discuss the methods of radiation and intersection in details
   B.) Explain the construction and working of a planimeter.

7. A.) What is a contour gradient? What are the uses of contour maps?
   B.) Explain the graphical method in plane table surveying.

8. Write short notes on any THREE:
   i.) Abney Level
   ii.) Check lines and Tie lines
   iii.) Gale's Traverse Table
   iv.) Conventional Signs.

[B16 ENG 2103]

II/IV B.Tech. DEGREE EXAMINATION

First Semester

ENVIRONMENTAL STUDIES

MODEL QUESTION PAPER

(Common to CIV,CSE & IT)

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1. Write short answers for the following:

   (a) Give the objectives of Environmental Studies
   (b) Define ecosystem
   (c) What are hotspots?
   (d) What is soil erosion?
   (e) What is sustainable development?
   (f) State the practical benefits of watershed management
   (g) What is biomagnifications movement?

2. Write about structure and function of forest ecosystem

3. Give an account of the various energy resources of India and their merits and demerits.

4. Give the bio-geographical classification of India and add a brief note on threats to biodiversity

5. Explain causes, effects and control measures of water pollution

6. Write a critical account of the effect of population growth on environment.

7. Give an account of rain water harvesting and watershed management with suitable example

8. Write short notes:

   a) Conflicts of water
   b) Effect of modern agriculture
   c) Noise pollution
   d) Solid waste management

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[B16 CE 2201]

II/IV B.Tech. DEGREE EXAMINATION

Second Semester

ANALYSIS OF STRUCTURES

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1. a) Define a statically determinate structure
   (b) State Castigliano's First theorem
   (c) What is the degree of indeterminacy of a fixed beam- Substantiate your answer.
   (d) Explain "Carry over Factor" with a sketch.
   (e) Show the load positions for max +ve shear force and –ve shear force if a U.D.L shorter than the span is traversing from left to right of a beam.
   (f) What are the advantages and disadvantages of moment distribution method?
   (g) Differentiate between thin cylinder and thick cylinder.

2. (a) A cantilever is loaded with a UDL throughout its length calculate the slope and deflection at the free end if the free end is propped to same level as that of the fixed end, calculate the prop reaction and the slope at the propped end. Use moment area method.
   (b) A beam of constant cross section 4m long is free supported at its ends. It is loaded at points 1m from each end with a load of 2kN. Find the ratio of the deflections in the centre of the beam to the deflection at the point under one of the loads. Use conjugate beam method.

3. (a) A fixed beam AB of length 6m is subjected to a constructed couple of 500 Nm(clockwise) at a point C which is at a distance of 3.5m from the end A. Draw SF & BM diagram assume "EI" to be constant.

   (b) A beam AB 4m fixed at A & B carries a UDL of 1500N/m. The support B sinks by "1cm". Find the fixed end moments and draw BMD for the beam. Take E =2x105 N/mm2, I = 8000 cm4.

4. Analyse the two span continuous beam shown in figure (a) by slope deflection method draw bending moment and shear force diagram young's modulus is same throughout.

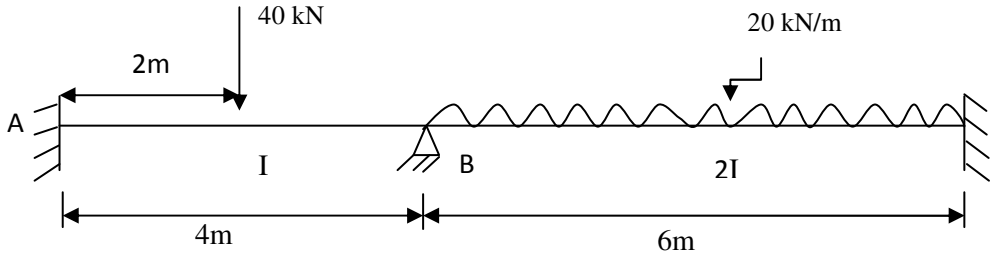


Fig. (a)

5. (a) A tension bar 5mis made up of two parts 3m of its length has cross sectional area of 10cm^2 while the remaining 2m has a cross sectional area of 20 cm^2. An axial load of 80 kN is gradually applied. Find the total strain energy produced in bar and compare this value with that obtained in a uniform bar of same length and having the same volume, when under the same load. Take E = 2 x 10^5 N/mm^2.

(b) Determine the vertical and horizontal displacements of joint C of the truss shown in fig.(b).

Given E = 200 × 10^6 kN/m^2, A = 100 × 10^{-6} m^2 for all members.

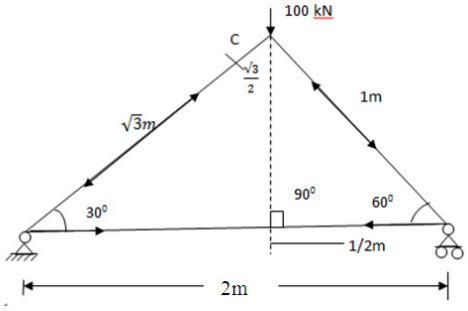
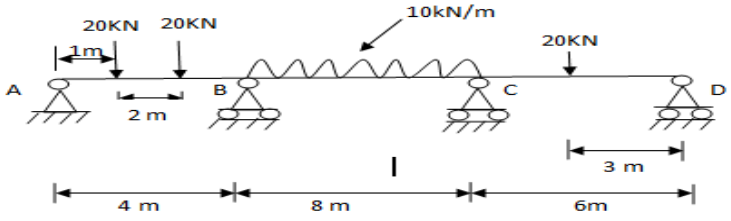


fig.(b)

6. Analyse the continuous beam shown in fig.(c) using theorem of three moments.



fig,(c)

7. The load system shown in fig. (d) crosses a simply supported beam over a span of 24 m. Determine (a) the maximum S.F. at a section 8 metres from the left hand end; (b) maximum B.M. under 25,000 N load.

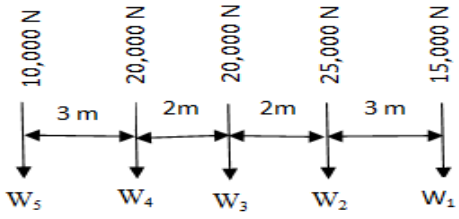


fig. (d)

8. (a) Explain different theories of failures.

(b) Find the thickness of the metal necessary for a cylindrical shell of internal diameter 160mm to with stand an internal pressure of 8 N/mm^2. The maximum hoop stress in the section is not to exceed 35N/mm^2. **[B16 CE 2201]**

[B16 CE 2202]

II/IV B.Tech. DEGREE EXAMINATION

Second Semester

REINFORCED CONCRETE STRUCTURES

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

Use of IS 456:2000 is allowed

1. (a) What are the advantages of adopting limit state method of design over working stress method of design?
   (b) Mention the situations where the doubly reinforced sections are to be adopted.
   (c) Explain clearly the difference between flexural bond and development bond.
   (d) Distinguish between (i) short and long columns and (ii) unsupported length and effective length of a compression member.
   (e) Explain clearly the difference in the behavior of one way slab and Two way slabs.
   (f) How does the shear span influence the mode of shear failure?
   (h) Why is it necessary to provide transverse reinforcement in a one way slab?

2. (a) Estimate the concrete stress block parameters in compression in limit state method.
   (b) Determine the moment of resistance of a rectangular beam section 250 mm wide and 400 mm depth. When it is reinforced with 3Nos.of 22 mm diameter bars on compression side and 3Nos. of 28 mm bars on tension side both at an clear cover of 30 mm for M 25 concrete and Fe415steel.

3. A rectangular reinforced concrete beam of 7 mm span (centre- to-centre of supports) resting on 300 mm wide simple supports, is to carry a uniformly distributed dead load (excluding self-weight) of 15 kN/m and live load of 20 kN/m. Design the beam section for maximum moment at midspan. Use M 25 grade concrete and Fe 415 steel.

4. A simply supported beam 300 × 600 mm (effective) is reinforced with five bars of 25 mm diameter. It carries a characteristic load of 80 kN/m(including its own weight) over an effective span of 6 m. out of five main bars, two bars can be bentup safely near the support. Design the shear reinforcement for the beam. Using M 20 grade of concrete and Fe 415 steel.

5. Design a simply supported slab to cover a hall with internal dimensions 4.0 m × 6.0 m. The slab is supported on masonry walls 230 mm thick. Assume a live load of 3 kN/m^2 and a finish load of 1.0 kN/m^2. Use M 20 concrete and Fe 415 steel. Assume that the slab to be prevented from lifting up.
6. Design the reinforcement for a column with l_{ex} = l_{ey}= 3.5 m and size 300 × 500 mm, subject to a factored axial load of 1250 kN with biaxial moments of 180 kNm, and

100 kNm(i.e., M_{ux}= 180kNm,M_{uy}= 100 kNm). Assume M 25 concrete and Fe 415 steel.

7. Design a square footing for a rectangular column 300 mm× 500 mm, reinforced with 6-25 mm Øbars, and carrying aservice load of 1250kN. Assume soil with an allowable pressure of 200 kN/m^2 at a depth of 1.25 m bellow ground. Assume Fe 415 grade steel for column and footing, and M 20 grade concrete for the fotting and M 25 grade concrete for column.

8. Design the torsional reinforcement in a rectangular beam section,350 mm wide and 750 mm deep, subjected to an ultimate twisting moment of 140 kNm, combined with an ultimate bending moment of 200 kNm and an ultimate shear force of 110 kN. Assume M 25 concrete, Fe 415 steel .

[B16 CE 2203]

II/IV B.Tech. DEGREE EXAMINATION

Second Semester

FLUID MECHANICS II

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks
All parts of a question must be answered at one place only

1. (a)What is difference between coquette and poiseuille flow?
   (b)State the characteristics of laminar boundary layer.
   (c) What is Von Karman Vortex trail?
   (d)What is meant by most economical channel section
   (e) Explain the functions of parshall flume
   (f) List the various types of Hydraulic jump.
   (g) What is Canal transition?

2 (a) Prove that the average velocity is 2/3rd of the maximum velocity for a steady laminar flow between two fixed parallel plates.

(b) Two fixed parallel plates kept 8cm apart have Laminar flow of oil between them with a maximum velocity 1.5m/s. Taking dynamic viscosity of oil to be μ= 2 N.s/m^2.Compute :

(i) the discharge per metre width
(ii)Shear stress at the plates
(iii) The pressure difference between the two points 25cm. apart
(iv) Velocity at 2 cm. from the plate
(v) The velocity gradient at the plates end.

3. (a)Explain the phenomena of boundary layer separation and methods of controlling it.

(b) The velocity distribution in the boundary layer is given by $\frac{u}{U} = \frac{3}{2}\left(\frac{y}{\delta}\right) - \frac{1}{2}\left(\frac{y}{\delta}\right)^3$, being the boundary layer thickness. Calculate
(i) Displacement thickness and
(ii) Momentum Thickness

4 (a) Derive the condition for maximum discharge for a given value of specific energy

(b) A kite of Surface are 0.4 m^2 flies in the air making an angle of 25° with the horizontal .The weight of the kite is 1.5 N and string tension is 5N.The string makes an angle of 70° with plane of the kite . If the wind velocity is 20 kmph , find the drag and lift coefficients of the kite .Density of air = 1.8 kg/m^3

5 (a) Derive the dynamic equation of gradually varied flow in open channel

(b) Water enters to a rectangular channel of uniform cross section a 2 t a velocity of 8m/sec. The depth of water is 60 cm. Verify is the flow is sub critical and calculate the critical depth and corresponding velocity Also calculate the specific energy at the inlet and at critical condition.

6 (a) Draw a neat sketch of the specific energy curve for an open channel with constant discharge. Define critical flow in an open channel and derive general criteria for such flow

(b) A rectangular flume 2m wide carries discharges at the rate of 2 m^3/s. the bed slope of the flume is 0.0004. At a section the depth of flow is 1 m. Calculate the distance of the section downstream where the depth of the flow is 0.9 m. solve by single step method. Assume rugosity coefficient as 0.014.Is the slope of the channel is mild or steel? How is this type of surface profile classified?

7 (a) Sketch the possible gradually varied flow profiles for the following arrangement of channels and controls

(i)Steep-horizontal mild ending with storage

(ii) A hydraulic jump occurs in a 0.5m. wide rectangular channel at the point ,where depth of water flow is 0.15 m. and Froude number is 2.5 . calculate the specific energy ,critical and sequent depths ,loss of head and energy dissipated.

8 write short notes on:

(a) Boussinesq eddy viscosity model
(b) Juokowsky profile
(c) Types of hydraulic jumps and features.

[B16 CE 2204]

II/IV B.Tech. DEGREE EXAMINATION

Second Semester

BUILDING PLANNING & DESIGN

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1. The Line plan of a residential building is shown in Figure:1. Draw
   i. Dimensioned Plan
   ii. Section along AB
   iii. Front Elevation by following the specifications given below.

Specifications:

1. Foundations: The depth of foundations shall be 1000 mm below ground level. The plain cement concrete (1:4:8) bed in the foundation will be 800 mm wide and 200 mm deep. The footings shall be of brick masonry in C.M (1:4). Width of first and second footing will be 500 mm and 400 mm respectively, whereas depth of both footings will be 400 mm.
2. Basement:The height of basement is 600mm Damp proof course of 50 mm thick shall be provided under the superstructure walls. Thickness of walls in the basement is 300mm
3. Superstructure: The walls in the superstructure will be of brick masonry in C.M (1:6) and all walls except the partition between toilets are 200 mm thick and the partition walls are 100 mm thick from floor. A square brick pillar 200X200 mm is provided at the left corner in front verandah.
4. Lintels and Sunshades: Lintels with R.C.C (1:2:4) are provided on all openings and depth is 150 mm with a bearing of 150 mm on either side.
   Sun Shades 100 mm thick at the wall face and 75 mm thick at free end are provided. All Sun Shades shall project 600 mm from face of the wall.
5. Height of Super Structure: The Walls in the superstructure are taken to a height of 3300 mm.
6. Roofing: Roofing consists of R.C.C (1:2:4) slab 110 mm thick and weather proof course with two courses of flat tiles in C.M (1:4) 50 mm thick is laid over it.
7. Flooring: Flooring shall be of polished Shahabad Stone slab 25 mm thick over 80 mm thick cement concrete (1:3:6) over sand filling basement.
8. Parapet wall: Parapet wall 100 mm thick and 700 height with brick masonry in C.M (1:4) shall be constructed all around the building.
9. Steps: Steps provided in the front and rear side of length 1200 mm. the width of tread is 300 mm and rise of step is 150mm

   D_1 1000 X 2100 Panelled Door

D_2 900 X 2000 Panelled Door
W_1 1200 X 1500 Glazed Window
W_2 1000 X 1500 Glazed Window
V_1 1000 X 600 Glazed Ventilator

(34 M)

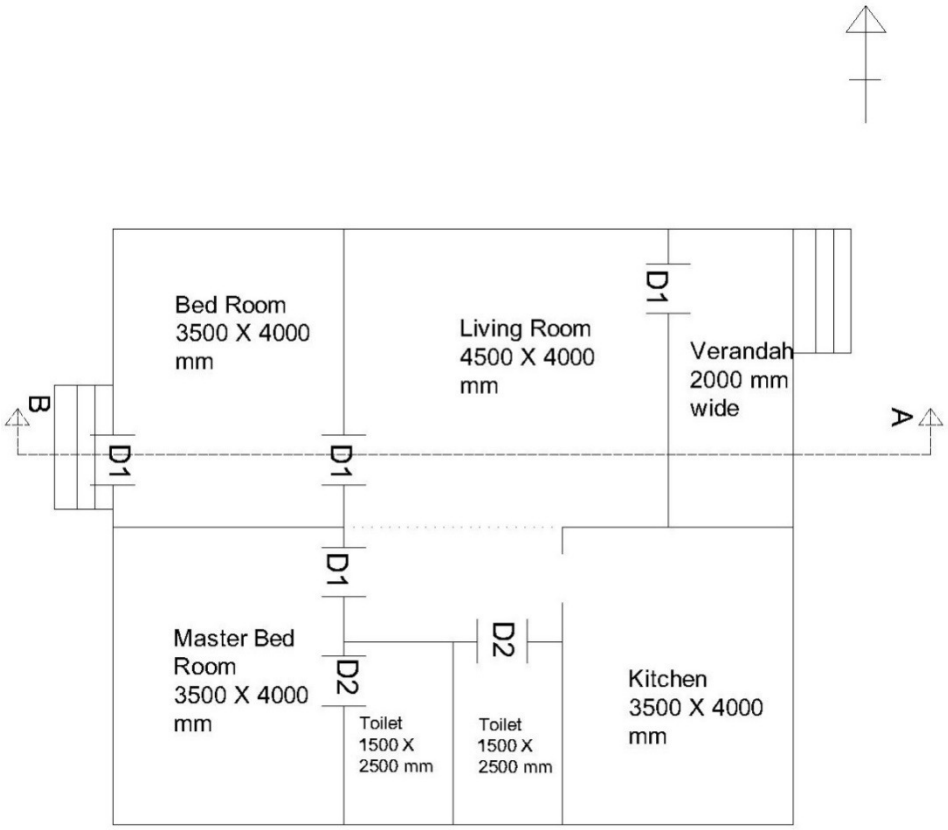


Figure: 1

2. AWhat is meant by Orientation of Building? Mention some suggestions for good orientation of the building in a tropical climate (6 M)

   B. What do you understand by "Principles of Planning" of a Building? Explain the significance of Aspect and Prospect for Residential Buildings. (6 M)

3. A. Summarize the various requirements of a Residential Building that affect the Selection of a suitable site for the building. (6 M)

   B. Distinguish between " Detached " and " Semi – Detached Houses " (6 M)

4. A. What are the usual requirements of a normal Residential Building? (6 M)

   B. Discuss the Various Bye-laws as applied to Buildings and indicate their usefulness (6 M)

5. A. Draw neat sketches to indicate the conventional signs for the following
   i. Brick Masonry
   ii. Concrete
   iii. Timber (6M)

   B. Draw the conventional symbols for

   i. Bed
   ii. Refrigerator
   iii. Kitchen Sink (6 M)

6. What is NBC? Write the building bye-laws for open spaces, plinth height and plinth area restrictions for different plot sizes. (12 M)

[B16 CE 2205]

II/IV B.Tech. DEGREE EXAMINATION

Second Semester

ADVANCED SURVEYING METHODOLOGIES

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1. Write short answers for the following:
   a. What is meant by face left and face right observations? Why is it necessary to take observations on both faces?
   b. What is Beaman Stadia arc? Mention its use.
   c. Distinguish between repetition and reiteration.
   d. Explain the principle of Tacheometry.
   e. What do you understand by term an ideal curve?
   f. State the formula to find the length of transition curve.
   g. What is axis signal correction?

2. Explain the step by step procedure for measuring the horizontal angles by the method of repetition. Mention the advantages and disadvantages.

3. A and B are two stations of a location traverse, their coordinates in m are as follows:

	Total Latitude	**Total Longitude**
A	34,321	7,509
B	33,670	9,652

   A Straight reach of railway is to run from B, roughly South of A to B invisible from C and roughly North of B, the offsets perpendicular to the railway being AC = 130m and BD = 72 m. Calculate the bearing of CD.

4. A.) What is Tangential Method of Tacheometry? Explain the different cases in Tangential method of Tacheometry.

   B.) Two distances of 20 m and 10 m were accurately measured and the intercepts on the staff between the outer stadia webs were 0.196 m at the former distance and 0.996 m at the later. Calculate the tacheometric constants.

5. A.) Derive the fundamental equation of a Stadia tacheometry.
   B.) In a subtense bar observation, the horizontal angles measured from two stations A and B are $3^0$10’ and $1^0$20’ respectively. Compute the distance between A and B if the length of subtense bar is 2m.

6. A.) What are the different types of horizontal circular curves? How would you select the most suitable type for a particular case?
   B.) Two Length intersect at a point C of chainage 3506m. The angle of deflection to the right is 40^0. Two straights are to be connected by a composite curve consisting of a circular curve of radius 320 m and two transition curves of length 50 m each on either side. Calculate the various elements and deflection angles for setting out the transition curve. The peg interval on the circular curve is 20m.

7. A.) Explain the procedure of setting out a curve by Rankines method. Give the computations carried out in this procedure.
   B.) Two tangents intersect at chainage 1180 m with their deflection angle being 36^0. Adopting the method of deflection angles, calculate the necessary data to set out a simple curve of 30m radius.

8. Write short notes on any THREE:
   v.) Base Line Measurements
   vi.) Elements of Reverse Curve
   vii.) Errors in theodolite.

[B16 CE 2206]

II/IV B.Tech. DEGREE EXAMINATION

Second Semester

ENGINEERING GEOLOGY

MODEL QUESTION PAPER

CIVIL Engineering

Time: 3 Hrs. **Max. Marks: 70**

Question No. 1 compulsory.
Answer any FOUR questions from the remaining.
All Questions Carry equal marks

All parts of a question must be answered at one place only

1. Answer the following:
    a. Specific gravity of mineral
    b. Chevron fold and thrust fault
    c. Draw neat sketch of fault and label its parts
    d. Draw Schlumberger method electrical Resistivity
    e. Over break of tunnel
    f. Geological Time scale
    g. Strike & dip
2. Describe the landforms produced by running water and describe about its civil engineering importance.
3. What is mineral? How do you identify minerals with help of physical properties of minerals
4. What are igneous rocks? Write about textures, structures and forms of Igneous rocks and write its engineering importance
5. Define the term fold? Describe about classification of folds with neat sketches
6. Explain principles of geophysical methods. How do you identify soil profile using electrical Resistivity method?
7. Write an essay on the role of engineering geologist in planning, design and construction of civil engineering works
8. Describe the geological investigations for dams and reservoirs with neat sketches