Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
ODD SEM JUNE REEXAM 2019

Max. Marks:100
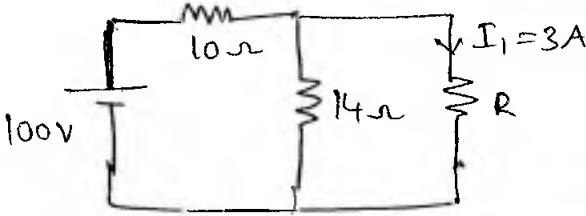Class: FY (C/M/E)         Semester:I
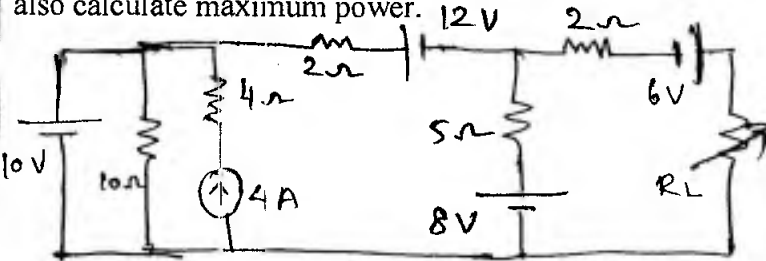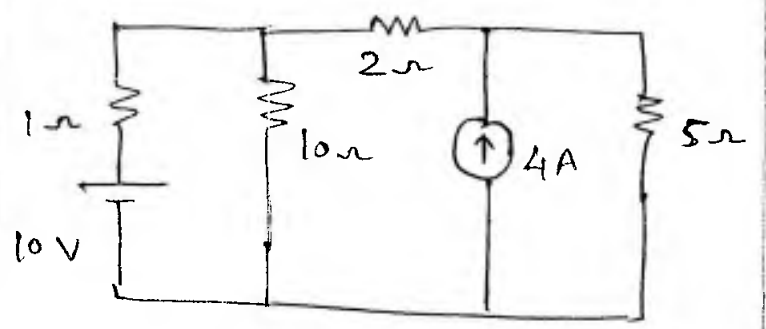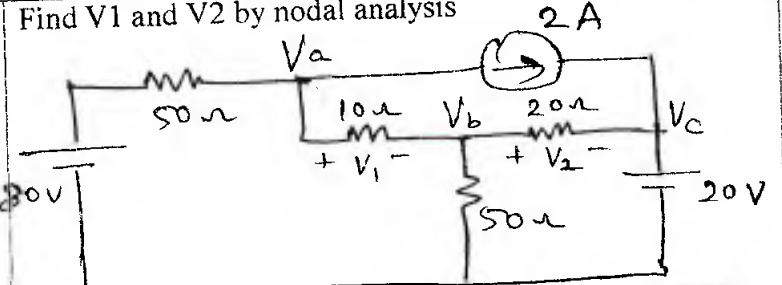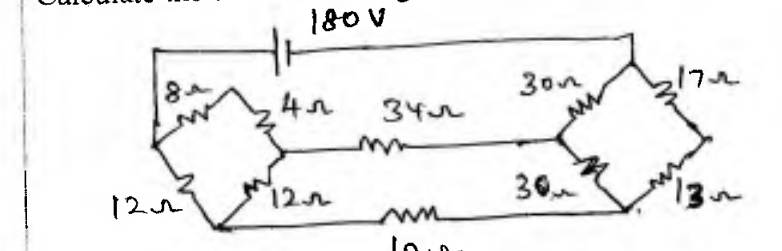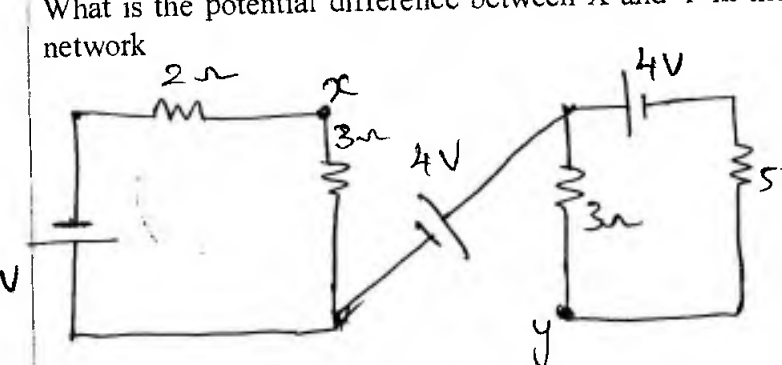Name of the Course: **Basic electrical ENGG**

Duration: 3 hours
Program:BTech
Course Code ES-BT102

o **Instructions:**
o **Question no 1 is compulsory .**
○ Attempt any four question out of remaining questions
○ Answers to all sub questions should be grouped together
o Any assumptions must be specified clearly.

| Q.No | | Marks | BL | PI | Course outcomes |
|---|---|---|---|---|---|
| 1a. | Find the value of R  | 4 | 2 | 1.3.1 | 1 |
| b. | Draw and explain the power triangle. | 4 | 2 | 1.3.1 | 2 |
| c. | State and explain Nortons theorem. | 4 | 2 | 1.3.1 | 1 |
| d. | Explain the losses that takes place in a transformer.Why transformer is rated in KVA. | 4 | | 1.3.1 | 3 |
| e. | What is back emf? | 4 | 2 | 1.3.1 | 3 |
| 2a | Prove that for a three phase balanced star connected load ,line voltage is √3 times the phase voltage | 10 | 2 | 1.3.1 | 2 |
| b. | Justify Why are single phase induction motors not self starting ? Explain split phase induction motors with phasor diagrams | 10 | 5 | 1.3.1 | 3 |

| 3a | A 5KVA ,1000/200V,50Hz ,single phase transformer gave the following test results:<br>OC test(hv side):1000V 0.24A 90W<br>SC test(hv side) 50V 5A 110W<br>Calculate the equivalent circuit of transformer with circuit constants . | 10 | 4 | 1.3.1 | 3 |
|---|---|---|---|---|---|
| b. | Three coils each with a resistance of 10ohms and reactance of 10 $\Omega$ are connected in star across a three phase 50 Hz 400V supply.Calculate line current,and readings of the two wattmeter to measure power. | 10 | 3 | 1.3.1 | 2 |
| 4a | Determine the value of R for maximum power transfer and also calculate maximum power.  | 10 | 3 | 1.3.1 | 1 |
| b. | Two circuits A and B are connected in parallel to a 115V 50 Hz supply..the total current taken by the combination is 10 A at unity power factor. Circuit A consists of a 10 ohm resistor and 200 microfarad capacitor connected in series,Circuit B consists of a resistor and inductor in serties Determine current, power factor,, impedence ,resistance and reactance of circuit B. | 10 | 3 | 1.3.1 | 1, |
| 5a. | Explain two wattmeter method of power measurement for a delta connected load with neat phasor diagrams. | 10 | 2 | 1.3.1 | 3 |
| b | Find the current through the 10 ohm resistor using superposition theorem.  | 10 | 3 | 1.3.1 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| 6a | Find V1 and V2 by nodal analysis  | 10 | 2 | 1.3.1 | 3 |
| b. | Explain the working principle of a transformer and draw the phasor diagram of a practical transformer for capacitive load. | 10 | | 1.3.1 | 2 |
| 7.a. | Explain the construction and working of a Dc motor. | 10 | 3 | 1.3.1 | 3 |
| b. | Calculate the current flowing through 10ohm resistor  | 5 | 2 | 1.3.1 | 1 |
| c. | What is the potential difference between X and Y in the network  | 5 | 3 | | 1 |

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**Re-Examination – June 2019 Examinations**

Max. Marks: 100                                        Duration: 03 hr
Class: F Y B.Tech (C/M/E)          Semester: I      Program: C/E/M Engineering
Name of the Course: Engineering Graphics I          Course Code : BT 103
**Instructions:**

1.  Attempt any five questions
2.  Draw neat diagrams
3.  Assume suitable data if necessary
4.  Use first angle method of projection only.

| Question No | | Maximum Marks | Course Outcome Number | Module No |
|---|---|---|---|---|
| Q1 (a) | The plan of 100mm line PQ measure 80mm. PointP is 30 mm in front of V.P. and end Q 50mm above H.P. the end P is in fourth quadarant and end Q is in second quadrant.the line is inclined at $30^0$ to V.P. draw its projections and find its inclinations with H.P. | 10 | I,II | 2 |
| Q1 (b) | A point is moving in a plane such that the sum of its distances from fixed points is always constant and is equal to 110 mm and the focal length is 80 mm. Draw an ellipse by the concentric circle method. | 10 | I,II | 1 |
| Q2 (a) | A line 110mm long has its plan and elevation lengths 80 mm and 90 mm respectively.one end of line 'P' is in H.P. and other end 'Q' is in V.P. draw its projections.assume the line in the third quadrant. find inclination of the line with the H.P. and V.P.also locate its Traces. | 10 | I,II, III | 3 |
| Q2 (b) | A circle of 50 mm diameter roll along a straight line without slipping, draw the curve traced by a point 'P' on the circumference of the circle for one complete revolution. | 10 | I,III | 1 |
| Q3 (a) | Circular lamina of diameter 60 mm is resting with one of its circumference point on V.P. Surface of the | 10 | I, III | 4 |

| | | | | |
|---|---|---|---|---|
| | lamina is tilted to V.P. in such way that the front view is perfect ellipse of major and minor axis are 60 mm and 30 mm respectively. Draw the projection of lamina if the surface of the lamina having inclination $35^0$ to H.P. also find the true inclination of the surface to the V.P. | | | |
| Q3 (b) | A rhombus of major diagonal 80 mm and minor diagonal 50 mm is resting on the H.P. on one of its corner, such that it appears in the T.V. as a square of 50mm diagonal. draw its projections if its major diagonal is inclined to the V.P. at $20^0$. find its inclination with the H.P. | 10 | I, III | 4 |
| Q4 (a) | A square pyramid side of base 40mm and axis length 60mm has one of the side of base in the H.P. the axis of solid is inclined to the H.P. at an angle $30^0$ and the T.V. of axis is inclined at an angle $45^0$ with the V.P. draw the projections if apex nearer to the observer. | 10 | I, III | 5 |
| Q4 (b) | A hexagonal prism of base 25 mm side and axis 45 long, is positioned with one of its base edges on HP such that, the axis is inclined at $30^0$ to hp and $45^0$ to VP. Draw its projections. | 10 | I, III | 5 |
| Q5 | A cone of base 70 mm diameter and axis 90 mm long is resting on its base on H.P. it is cut by section plane perpendicular to V.P. and parallel to and 15 mm away from one of its end generators. Draw the sectional T.V. , F.V., sectional S.V. and true shape of section | 20 | I , II, III, IV | 6 |
| Q6 | A cone with base diameter 60mm , axis height 68 mm stands vertically on its base in H.P. a circular hole of 30 mm diameter is drilled through the cone such that its axis is perpendicular to V.P. , parallel to H.P. and 20 mm above the base of cone. Draw the D.L.S showing effect of hole if axis of hole is 10 mm on right side of axis of cone. | 20 | I , II, III, IV | 7 |
| Q7 (a) | A pentagonal pyramid side of base 35 mm and height 70mm rests on its base on the HP with one side of base perpendicular to the VP, such that the true shape of the section in an isosceles triangle of maximum possible base and maximum height. Draw its FV, sectional TV and true shape of section. | 10 | I, III, IV | 6 |
| Q7 (b) | Elevation of a line AB is 75 mm and is inclined to XY line at 450.end A is 25 mm above H.P. and end B is 10 mm behind V.P. draw its projections if length of line AB is 95 mm and end B is in third quadrant. Find the inclination of line AB with H.P and V.P. | 10 | I, III | 2 |

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# SARDAR PATEL COLLEGE OF ENGINEERING

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### Re-Examination - June 2019 Examinations

SET-B

Program:First Year Engineering( C/E/M)       Duration: 03 hour
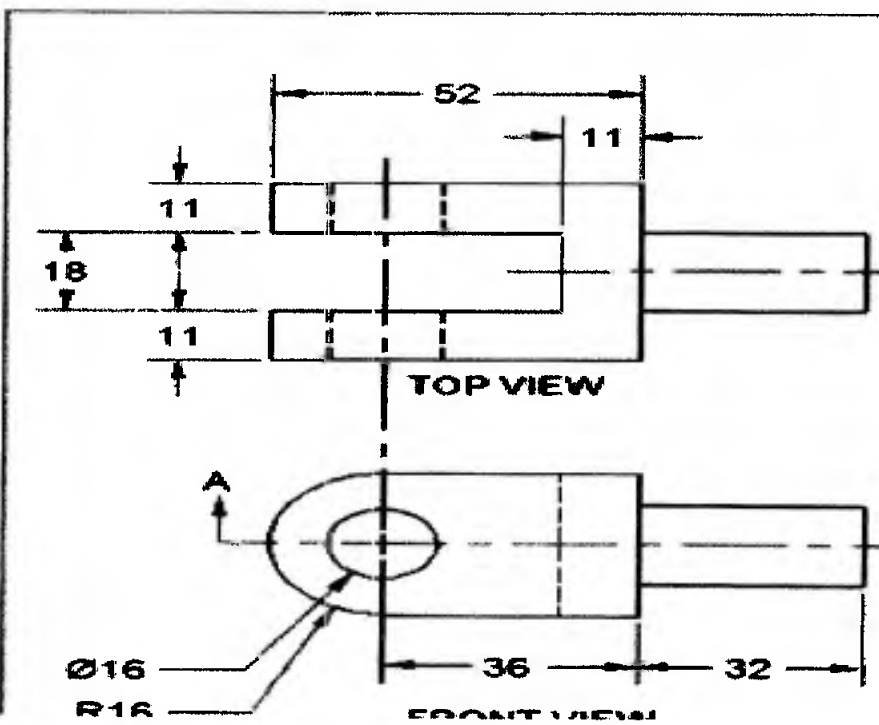
Course Code: ES-BT103                         Maximum Points:100 marks

Course Name:Engineering Graphics-I            Semester:I

**Notes:**1. Questionnumber 01 is compulsory.
2. Solve any four questions out of remaining four main questions.
2. Draw neat schematic diagrams wherever is necessary, **highlight** important points.
3. Assume suitable data if necessary and mention it.
4. Use **first angle** method of projection only.

| Q. No. | Questions | Ma rks | C O | BL | PI |
|--------|-----------|--------|-----|----|----|
| Q1 A | A pentagonal pyramid of 30 mm edge of the base and 60mm axis height is lying on one of its triangular surface in the V.P. So that axis is inclined at an angle of $45^0$ to the H.P. Draw its front view and top view. | 10 | 1 , 2 | 2 | 1.3 .1 |
| Q1 B | Draw an isometric view of the following using natural scale.  | 10 | 1 , 2 , 3 | 2 | 1.3 .1 |
| Q2 | Elevation of a line AB is 75 mm and is inclined to XY line at $45^0$.end A is 25 | 10 | 1 | 2 | 1.3 |

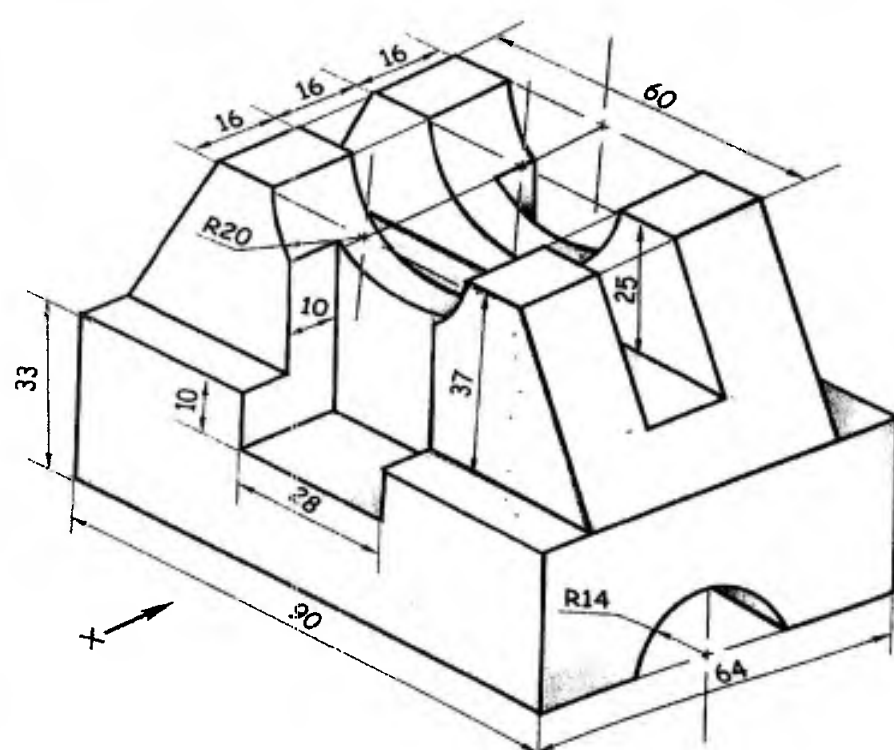| | | | | | |
|---|---|---|---|---|---|
| A | mm above H.P. and end B is 10 mm behind V.P. draw its projections if length of line AB is 95 mm and end B is in third quadrant. Find the inclination of line AB with H.P and V.P. | | , 2 | | .1 |
| Q2 B | A pentagonal plane lamina of side 30 mm is resting on the H.P. on one of its corner so that the surface makes an angle of $60^0$ with the H.P. if the side opposite to this corner makes an angle of $30^0$ with the V.P. and is parallel to the H.P. draw the front and top views of a pentagon. | 10 | 1 , 2 | 2 | 1.3 .1 |
| Q3 A | A line 110mm long has its plan and elevation lengths 80 mm and 90 mm respectively.one end of line 'P' is in H.P. and other end 'Q' is in V.P. draw its projections.assume the line in the third quadrant. find inclination of the line with the H.P. and V.P.also locate its Traces. | 10 | 1 , 2 | 2 | 1.3 .1 |
| Q3 B | Draw the projections of a regular hexagon of 25mm sides, having one of its side in the H.P. and inclined at 60 to the V.P. and its surface making an angle of 45°with the H.P. | 10 | 2 , 3 | 2 | 1.3 .1 |
| Q4 A | A circle of 50 mm diameter roll along a straight line without slipping, draw the curve traced by a point 'P' on the circumference of the circle for one complete revolution. | 10 | 1 | 2 | 1.3 .1 |
| Q4 B | A square pyramid side of base 40mm and axis length 60mm has one of the side of base in the H.P. the axis of solid is inclined to the H.P. at an angle 300 and the T.V. of axis is inclined at an angle 450 with the V.P. draw the projections if apex away from the observer. | 10 | 2 , 3 | 2 | 1.3 .1 |
| Q5 A | A point is moving in a plane such that the sum of its distances from fixed points is always constant and is equal to 110 mm and the focal length is 80 mm. Draw an ellipse by the concentric circle method. | 10 | 1 , 2 | 2 | 1.3 .1 |
| Q5 B | The plan of 100mm line PQ measure 80mm. PointP is 30 mm in front of V.P. and end Q 50mm above H.P. the end P is in fourth quadarant and end Q is in second quadrant.the line is inclined at $30^0$ to V.P. draw its projections and find its inclinations with H.P. | 10 | 1 | 2 | 1.3 .1 |

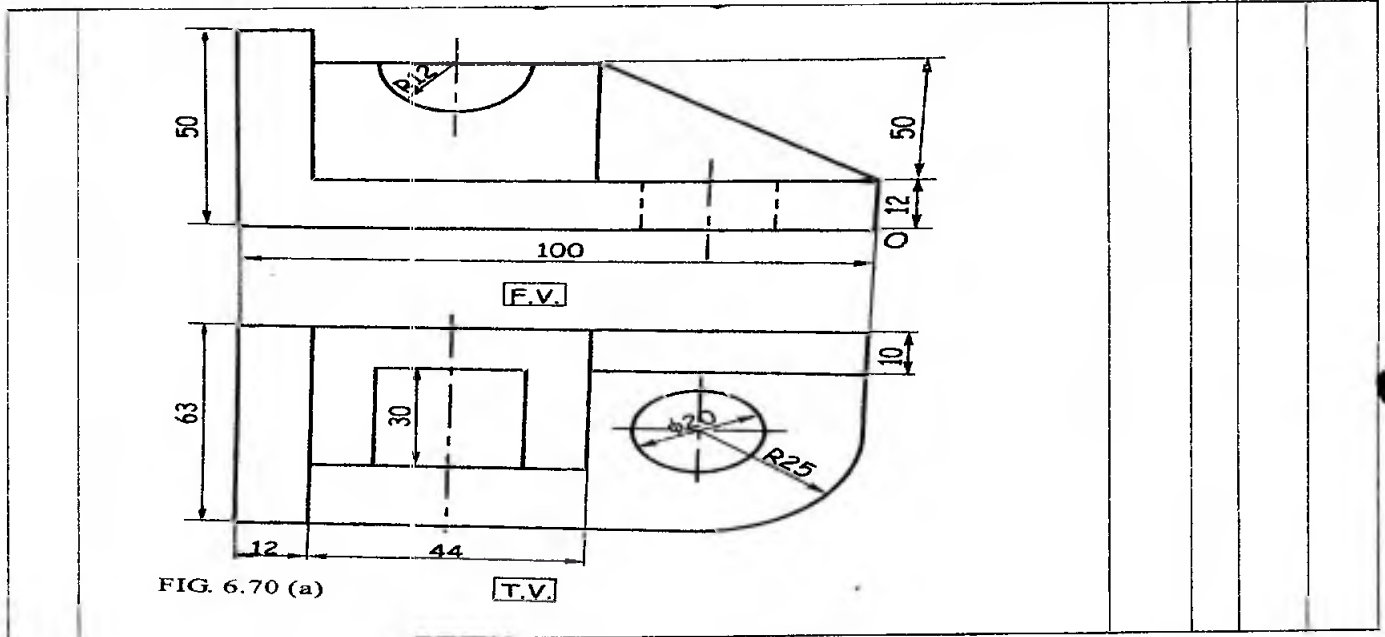| Q6 | Draw the following orthographic projection view of figure<br><br>1}FRONT VIEW  2} TOP VIEW  3} LHSV<br><br> | 20 | 2,<br>3 | 2 | 1.3<br>.1 |
|----|----|----|----|----|----|
| Q7<br>A | The end A of a straight line AB 90mm long, is in the second quadrant and 15 mm from both the H.P. and the V.P. end B is in the third quadrant. The line is inclined at $30^0$ with the H.P.and the distance between the end projector measured parallel to the XY line is 60mm. draw its projections of line, find its inclination with the V.P. aslo locate its traces. | 10 | 3 | 2 | 3.2<br>.3 |
| Q7<br>B | Draw an isometric view of the following using natural scale. | 10 | 2,<br>3 | 2 | 1.3<br>.2 |

FIG. 6.70 (a)

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**KT Exam – June 2019**

(Revised Syllabus)

**Program:** F.Y. B.Tech (C/M/E)　　　　　　　　**Duration:** 03 hours
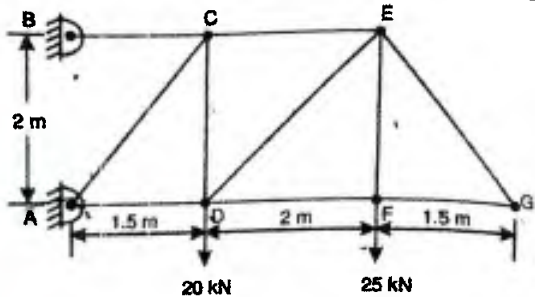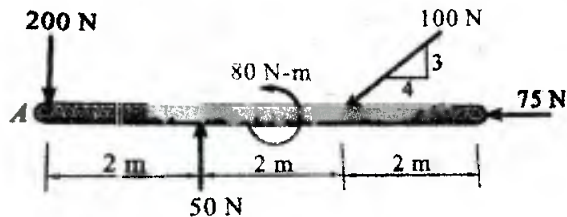
**Course Code:** ES-BT104　　　　　　　　　　　**Maximum Points:** 100 marks

**Course Name:** Engineering Mechanics-I　　　　**Semester:** I

**Notes:** 1. Attempt **any FIVE** questions out of **SEVEN** questions.
　　　　　2. Assume suitable data wherever required and state it clearly.
　　　　　3. Figures to the right indicate full marks.

| Q.No. | Questions | Points | CO | BL | PI |
|---|---|---|---|---|---|
| **Q.1.** | | | | | |
| a) | For the pin jointed truss shown in **figure 1** below,<br>　i)　Check if the truss is perfect or imperfect<br>　ii)　Find the support reactions<br>　iii)　Find the forces in all members of truss using **Method of Joints.**<br><br><br>**Figure 1.** | 20 | CO2 | L1,<br>L3 | 1.3.1,<br>2.1.1,<br>2.1.2,<br>2.1.3,<br>2.2.3 |
| **Q.2.** | | | | | |
| a) | Replace the system of forces and the couple shown in **figure 2** by a single force couple system at point 'A'.<br><br><br>**Figure 2.** | 10 | CO1 | L1,<br>L2 | 1.3.1,<br>2.1.1,<br>2.1.3,<br>2.2.2,<br>2.2.3, |
| b) | Two identical cylinders of diameter 100 mm and weighing 200 N each are placed as shown in **figure 3**. All contact surfaces are smooth. Find out reactions at contact points A, B and C. | 10 | CO2 | L1,<br>L2,<br>L3 | 1.3.1,<br>2.1.1,<br>2.1.2,<br>2.1.3, |

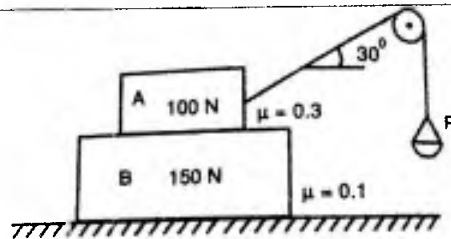| | | | | | | 2.2.3 |
|---|---|---|---|---|---|---|
| |  Figure 3. | | | | | |
| **Q.3.** | | | | | | |
| a) | State and prove Parallelogram Law of forces. | 05 | CO1 | L4 | 1.3.1, 2.1.1 | |
| b) | What is a Zero Force member in a Truss? With examples, state the conditions for a zero force member in the truss. | 05 | CO2 | L3 | 1.3.1 2.1.3 | |
| c) | For the beam shown in **figure 4** below, find the reactions at supports 'A' and 'B' respectively using conditions of equilibrium.  Figure 4. | 10 | CO2 | L1, L2 | 1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3 | |
| **Q.4.** | | | | | | |
| a) | Find the resultant of the force system acting on a body OABC shown in **figure 5**. Also find the distance of the resultant from point 'O' and find the points where the resultant will cut the x and y axis.  Figure 5. | 12 | CO1 | L1, L2 | 1.3.1, 2.1.1, 2.1.3, 2.2.2, 2.2.3, | |
| b) | Blocks A and B are resting on a ground as shown in **figure 6** below. Coefficient of friction $\mu$ between the ground and the block is 0.1 and that between A and B is 0.3. Find the minimum value of 'P' in the pan so that motion starts. | 08 | CO2 | L1, L2, L3 | 1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.4.1 | |

Figure 6.

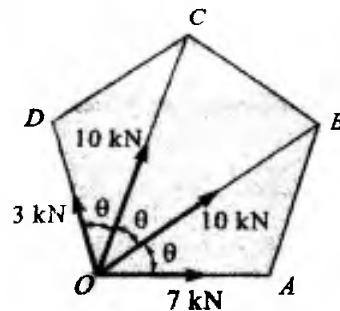| Q.5. | | | | | |
|------|---|----|-----|----|--------|
| a) | Forces 7 kN, 10 kN, 10 kN and 3 kN, respectively act at one of the angular point of the regular pentagon towards the other four point taken in order. Find their resultant completely. | 08 | CO1 | L1, L2 | 1.3.1, 2.1.1, 2.1.3, 2.2.2, 2.2.3, |



Figure 7

| | | | | | |
|------|---|----|-----|----|--------|
| b) | State the assumptions made in the analysis of trusses. (Any four) | 04 | CO2 | L3 | 1.3.1 |
| c) | A ladder having a length of 6m is resting against a wall making an angle of $50^0$ with the wall, having coefficient of friction as 0.25. Calculate the horizontal force 'P' required to be applied at the bottom end to avoid slipping of the ladder. Weight of the ladder is 350 N and the floor is smooth. | 08 | CO2 | L1, L2, L3 | 1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.4.1 |

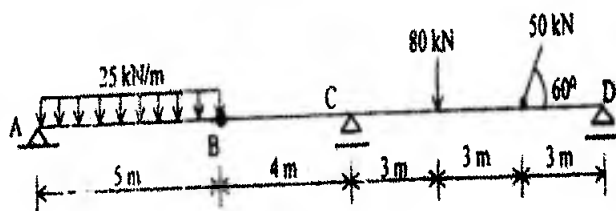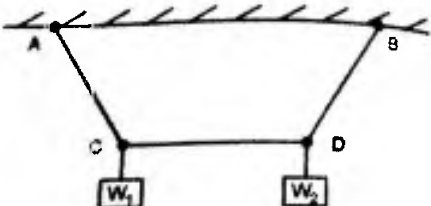| Q.6. | | | | | |
|------|---|----|-----|----|--------|
| a) | Using **principle of virtual work,** find the support reactions of the beam shown in **figure 8** below. Point 'B' represents internal hinge. | 15 | CO3 | L1 | 1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3 |



Figure 8.

| | | | | | |
|------|---|----|-----|----|--------|
| b) | Find the magnitude of forces 'P' and 'Q' such that if they act at right angles, their resultant is 5.8 N. If they act at an angle of 60 degrees, their resultant is 7 N. | 05 | CO1 | L3 | 1.3.1, 2.1.1, 2.1.2, |

| | | | | | 2.1.3, 2.2.3 |
|---|---|---|---|---|---|
| **Q.7.** | | | | | |
| a) | Rope AB 4.5 m long is connected at two points A and B at the same level and 4 m apart as shown in **figure 9.** Load of w1 = 1500 N is suspended at point C. What load w2 should be connected at point D to maintain the position shown? [Given: AC = 1.5 m , BD = 1m]  Figure 9. | 10 | CO1 | L1, L2, L3 | 1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3 |
| b) | Explain the importance of Free Body Diagram. | 04 | CO2 | L3, L4 | 1.3.1 |
| c) | Explain the system of forces. Give examples of each type of system. | 06 | CO1 | L4 | 1.3.1 |