

Question Bank CIV 101 2023

Module 1 Section A

- Q1 What is brick. Describe its engineering properties.
- Q2 Describe how bricks are classified?
- Q3 How bricks are tested in the field.
- Q4 Explain the differences between Brick-Masonry and Stone Masonry?
- Q5 Write short note on classification of Rocks?
- Q6 Give examples of igneous rock, sedimentary rock and metamorphic rocks
- Q7. What are the characteristics of good building stone?
- Q8. Discuss various uses of bricks and stones.
- Q16. What tests would you specify to ensure if the cement supplied at the site is of good quality?
- Q19. State the properties of good mortar.
- Q20. What is mortar, What are the uses of mortar.
- Q22. Explain manufacturing process of concrete.
- Q23. What is meant by workability of concrete?
- Q24. What is curing? What is its significance?

Module 1 Section B

- Q25. What do you understand by compacting factor? Describe the test procedure to determine this factor.
- Q26. Which test are performed in the laboratory to test the bricks. Explain any one.
- Q27. Discuss the various characteristics of a good building stone?
- Q28. Define water cement ratio. How does it influence concrete strength?
- Q. What are the various test performed on cement? Explain any one.
- Q29. Explain the function of ingredients of cement.
- Q33. Describe the procedure of finding compressive strength of building material.
- Q34. Discuss the terms; Frog, king closer, half bat, natural bed, workability of stone.

Q35. How stone masonry is classified.

Module 1 Section C

Q37. What are bonds, explain their types. What are the important points to remember while making brick or stone masonry?

Q38. Explain various test performed on bricks in the laboratory.

Q39. Which Engineering Tests are performed to test stone for various purposes. Explain

Q41. Enumerate the laboratory test for cement and describe any two of them.

Q42. Describe various factors which affect the strength of cement concrete.

Q43. Describe procedure of performing slump test of concrete.

Module 2 Section A

Q1. Explain the various types of surveying.

Q2. What are the various types of chains and Tapes.

Q3. What is difference between chain survey and compass survey?

Q4. Write short notes on whole circle bearing system and quadrantal bearing system.

Q5. Convert the following whole circle bearings to quadrantal bearings.

(a) $350^{\circ} 10'$ (b) $225^{\circ} 30'$ (c) $120^{\circ} 30'$ (d) $50^{\circ} 15'$

Q6. Name different instrument and accessories used in surveying with their uses.

Q7. Convert the following quadrantal bearing into whole circle bearing.

(a) $N 15^{\circ} 30' E$ (b) $N 46^{\circ} 15' W$ (c) $S 35^{\circ} 45' E$ (d) $S 70^{\circ} 30' W$

Q8. What are the different types of levelling operations. Explain any one in detail.

Q9. Write short note on the following; Survey station, Base line, Check line, Offset.

Q10. Explain the following: Levelling, Level surface, Level line, Horizontal plane.

Q11. Define the terms: True and magnetic bearing, Local Attraction, Back bearing, Magnetic declination.

Module 2 Section B

Q12. Draw the neat and labelled diagram of prismatic compass.

Q13. Discuss all the accessories used in chain surveying.

Q14. Discuss various errors in chain and compass surveying.

Q15. Write a short note on EDM, GPS and theodolite.

Q16. A Dumpy level is set on the field and the staff reading on bench mark of 200m is taken 1.855. Then on points P,Q,R the staff reading was 2.50, 1.75, 3.05. Find the Reduce level of these points. By Height of instrument method

Q17. In a levelling operation following staff intercept is found 1.05, 1.885, 1.50, 2.55. the first reading was taken on bench mark of 150.50m find the reduce level of the other points by rise and fall method. Instrument was not shifted.

Q18. Write the difference between prismatic compass and surveyor's compass.

Q19. Between points A and E which are 250 m apart in east-west direction, a base line AE is drawn and perpendicular offsets are drawn. At Chainage 50 m at point B one offset BF of 35 on north side is drawn, at chainage 120m point C one offset CG on south of 40 m is drawn, and at chainage 180m point D an offset DH of 50 on north side is taken. Find the area of AFHEGA.

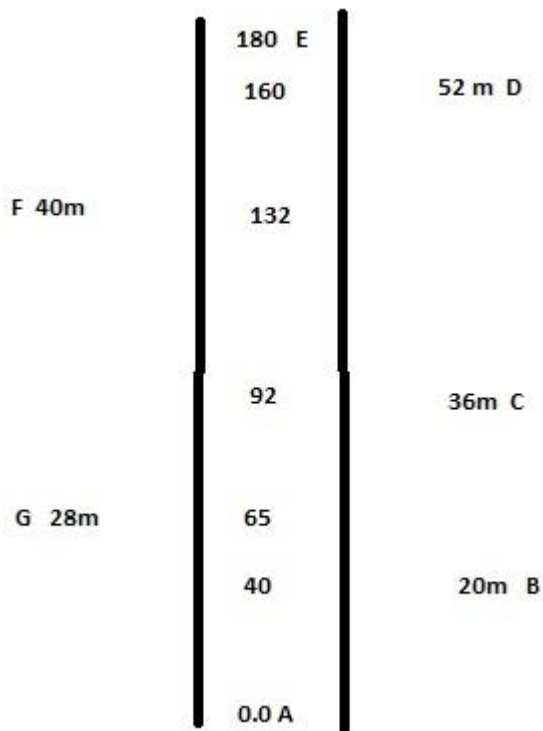
Q20. The following consecutive reading were taken with a level and 4m levelling staff ground at common interval of 30m as 0.725 on A, 0.935, 2.845, 3.745, 3.935, 0.965, 1.135, 1.785, 2.625, 3.845, 0.965, 1.575 and 2.015 on B. The elevation of point A is 220.50m. Make up level book page, apply usual check and calculate the reduced levels of points. Also calculate the gradient of line AB.

Q21. The fore bearings of the line AB, BC, CD and DE are $45^{\circ}30'$, $120^{\circ}15'$, $200^{\circ}30'$ and $280^{\circ}45'$ respectively. Find angles B,C and D.

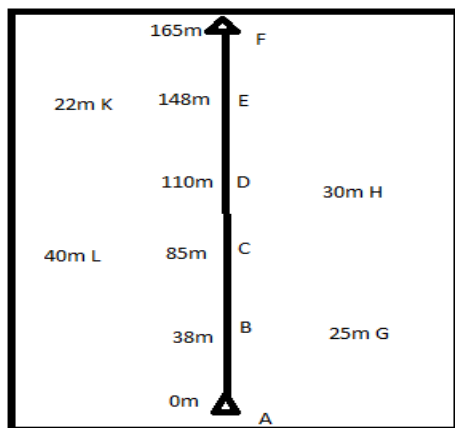
Q13. The bearings of the line OA, OB, OC and OD are $30^{\circ}30'$, $140^{\circ}15'$, $220^{\circ}45'$ and $310^{\circ}30'$ respectively. Find angles AOB, BOC and COD.

Module 2 Section C

Q22. A Traverse ABCDA is made in the form of a square taking in clockwise order. If the bearing of AB is $120^{\circ}30'$ find the bearings of the other sides.



Q23. Determine the area of the field AGHFKLA as shown in the figure in the chain and offset survey. Assume suitable scale. Base line AF length is 165m.



Q24. The following reading are successively taken with a level: 0.355, 0.485, 0.625, 1.755, 1.895, 2.350, 1.780, 0.345, 0.685, 1.230 and 2.150 the instrument is shifted after 4 and 7 reading. Prepare a level book and calculate the RL of different point. The RL of the first point is 255.5 m. (use any method)

Module 3 Section A

Q1. Define Smart City. What are the objectives of smart city.

- Q2. What are the features of the smart city.
- Q5. What are the indicators of smart city.
- Q6. What are the Components of the smart city.
- Q7. What are the benefit of the smart city.
- Q9 . Explain Green buildings and its importance in short.
- Q10. What do you understand by Green buildings, what is the need of green buildings?
- Q11. What is the objective of the green buildings?
- Q13. Compare green buildings with traditional buildings
- Q17. Describe merits and demerits of green buildings.
- Q18. Describe some famous Indian green buildings.
- Q20. Write short note on green building rating system.
- Q21. What do you understand by non-conventional energy?
- Q22. Write short notes on solar energy.
- Q23. Write short notes on wind energy.

Module 3 Section B

- Q24. Write short notes on Bio energy and Tidal energy.
- Q25. Write short notes on Geo-thermal energy and hydropower energy.
- Q3. What is the meaning of smart solutions in smart city?
- Q4. What are the features for area based development.
- Q8. What are the barriers in development of smart cities?
- Q12. Discuss the advantages of green Buildings.
- Q14. What factors are considered in designing the green buildings?
- Q15. What is the importance of green buildings?
- Q16. Discuss various construction materials used in green buildings.
- Q19. Discuss the fundamental principles of green buildings.

Module 3 Section C

- Q20. Describe Green buildings as futuristic buildings.

Q21. Discuss, how rain water harvesting is very essential in country like India

Q22. Describe in details the Smart cities in Indian Context.

Q23. Write an Essay on Non-conventional Energy sources.

Module 4 Section A

1. Two forces 100N and 150 N are acting simultaneously at a point. What is the resultant of these two forces if the angle between them is 45° .

2. With an example explain how the resultant of coplanar parallel forces can be found.

3. What do you understand by equilibrium, mention conditions of equilibrium?

4. What do you understand by composition and resolution of forces?

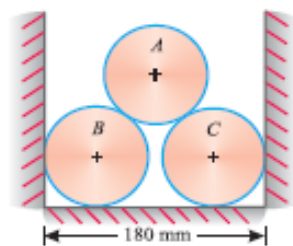
5. Explain with the help of diagram (a) parallel forces (b) concurrent forces (c) coplanar non concurrent forces (d) non coplanar and concurrent forces.

6. Explain Triangle law of forces and Polygon law of forces, statement figures and uses

7. State law of parallelogram law of forces and prove it .

8. What do you understand by free body diagram? Give any two examples.

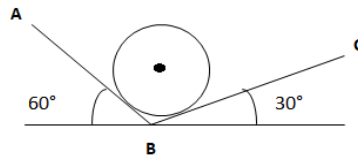
9. Make free body diagram of ball C in the figure



10. Explain Concurrent Forces, Coplanar Forces, UDL and UVL.

11.State Varignon's moment theorem with examples.

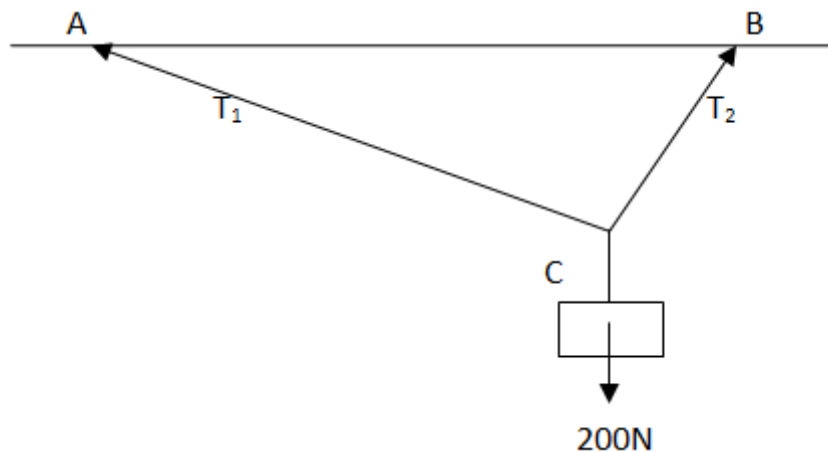
12. A Ball is resting between two inclined planes, inclination of the planes are 60° and 30° , as shown in the figure . If the weight of ball is 500 N. Draw the free body diagram of the ball and find the reactions on the inclined planes.



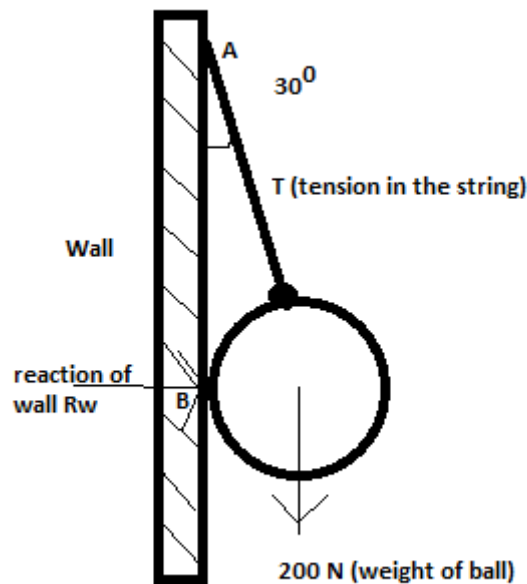
13. What is the meaning of resultant and equilibrant show in examples.

Module 4 Section –B

14. A block of weight is hanged by two strings as shown in the figure, draw free body diagram of the joint C and find the tensions T_1 and T_2 in the string AC and CB. Take the weight of the rectangular Block 200 N. T_1 is at 30° and T_2 is at 60° form horizontal support.



15. A smooth sphere of weight W is supported by a string fastened to a point A on the smooth vertical wall, the other end is in contact with point B on the wall as shown in Fig. Weight of ball is 200 N. find the reaction of ball on wall (R_w) and tension in the string (T).



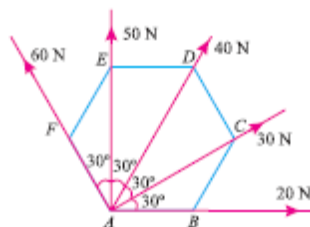
16. Explain the following (a) triangle law of forces (b) law of parallelogram (c) polygon law of forces

17. State Lami's theorem of equilibrium with examples and figures.

18. Describe formula used to find resultant of parallelogram law of forces. Take any example.

19. Find the magnitude of two forces, such that if they act at right angles their resultant is $\sqrt{10}\text{ N}$. But if they act at 60° , their resultant is $\sqrt{13}\text{ N}$.

20. The forces 20 N , 30 N , 40 N , 50 N , and 60 N are acting at one of the angular point of the regular hexagon, toward the other five angular points, taken in order. Find the magnitude and direction of the resultant force.



21. The following forces act at a point

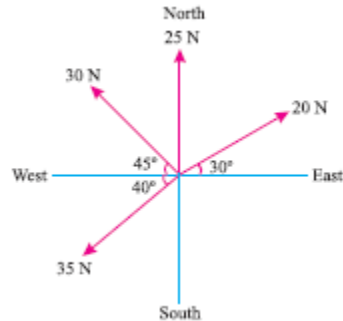
(i) 20 N incline at 30° toward the North of East

(ii) 25 N toward the North.

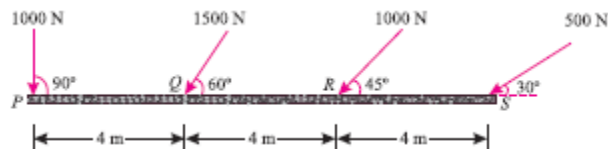
(iii) 30 N toward the North West and

(iV) 35 N inclined at 40° toward the South of West.

Find the magnitude and direction of the resultant force.

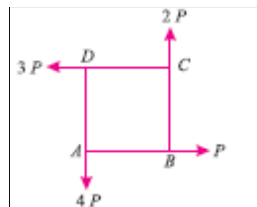


22. Find the magnitude, direction and position of the resultant force.



Module 4 Section C

23. Four forces equal to P , $2P$, $3P$, $4P$ are respectively acting along the four sides of a square ABCD taken in order. Find the magnitude direction and position of the resultant force.

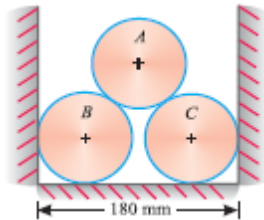


24. A light string ABCDE whose extremity A is fixed, has weights W_1 and W_2 attached to it at B and C. It passes round a small smooth peg at D carrying a weight of 300 N at the free end E as shown in the figure . If in the equilibrium position BC is horizontal and AB and CD make 150° and 120° with BC, find

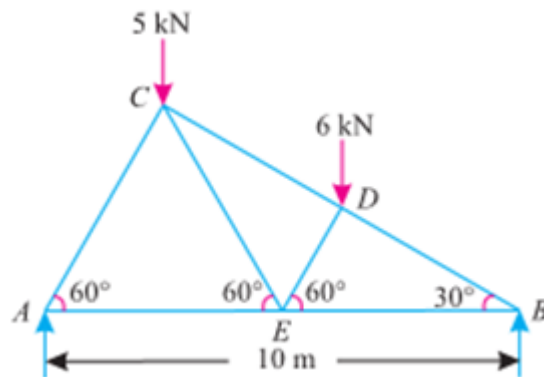
(i) Tension in the portion AB, BC and CD of the string and (ii) Magnitude of W_1 and W_2 .



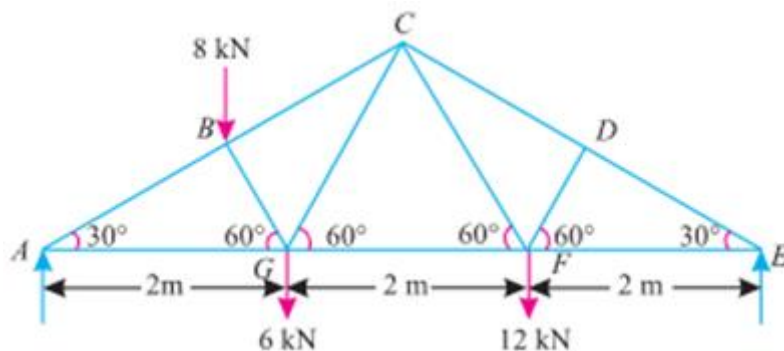
25. Three cylinders weighing 100 N each and of 80 mm diameter are placed in a channel of 180 mm width as shown in the figure . Determine the pressure exerted by (i) the cylinder A on B at the point of contact (ii) the cylinder B on the base (iii) the cylinder B on the wall.



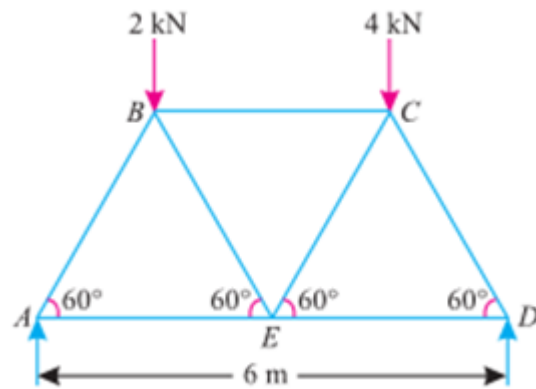
Q26 A truss of 10 meters is loaded as shown in the figure below. Find the forces in all the members of the truss.



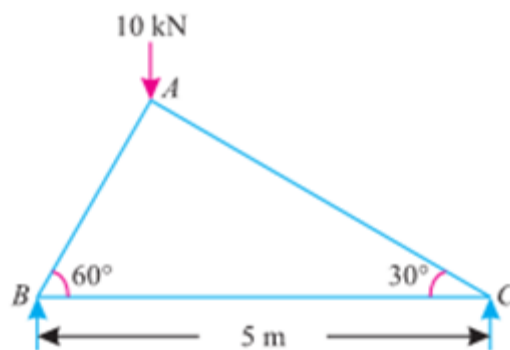
Q27 An Inclined truss is loaded at point B,G,and F by 8kN,6kN and 12kN respectively. Determine the forces in members BC, GC and GF of the truss.



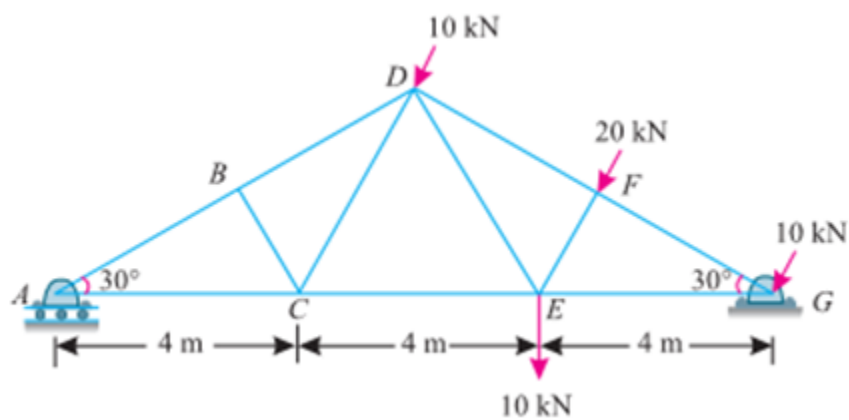
Q28. Each member of the truss is 3meter length. The truss is freely supported at its end points. At points B and C forces 2kN and 4kN are applied respectively. Find the forces in all the members of the truss. Also indicate whether the forces compressive or tensile in nature.



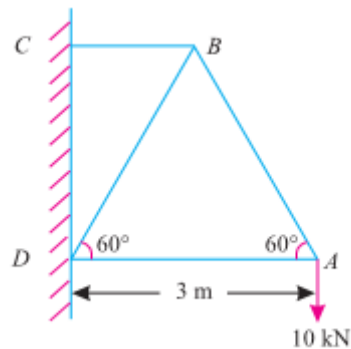
Q29 Truss ABC has a span of 5m as shown in the figure carries a load of 10kN at apex A. Find the forces in all the members of the truss.



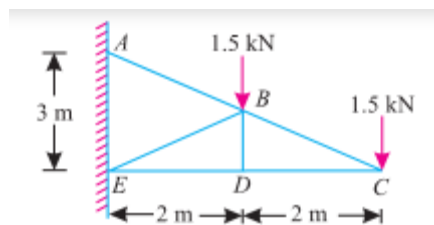
Q30. A truss of 12 m span is loaded as shown in the figure. Determine the forces in the members BD, CE, CD of the truss.



Q31. A cantilever truss of 3m span is loaded as shown in the figure. Find the forces in all the members of the truss.



Q32. A cantilever truss of 3m span is loaded as shown in the figure. Find the forces in all the members of the truss.



Module 5 Section A

- Q1. Derive an expression for Moment of Inertia for a Rectangular section about its centroidal axis.
- Q2. What do you understand by moment of inertia. Explain perpendicular axis theorem.
- Q3. Derive expression for parallel axis theorem.
- Q4. Determine the moment of inertia of a rectangular section from basic principle.
- Q5. Determine the moment of inertia of a triangular section about its base.
- Q6. Write the formula for C.G. of the following (show C.G. by making their sketches)
- (a) Semi Circle, (b) Right Circular Cone, (c) Hemi Sphere, (d) Right Angle Triangle.
- Q7. Write the formulae for moment of inertia for the following .
- (a) Rectangle of width b and depth d about xx and yy axis

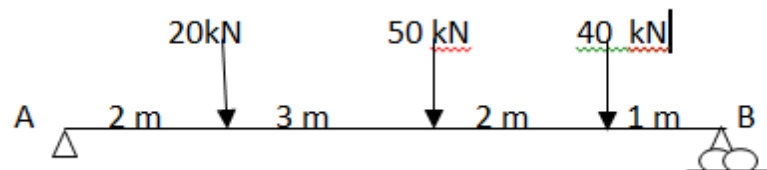
(b) Circle about xx and yy axis

(c) circle about zz axis

(d) triangle about its c.g. and about its base (say base width b and height h)

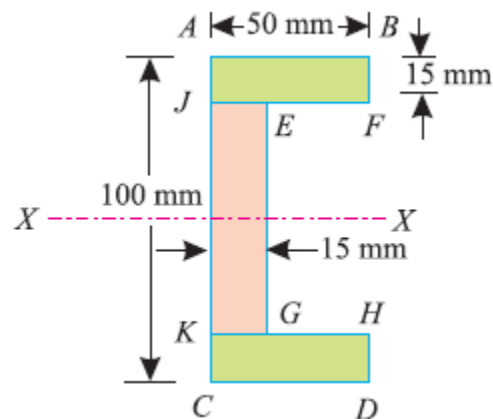
Q8. What is the meaning of centroid and centre of gravity, make figure of some regular figure and show their CG coordinates.

Q9. Determine support reactions for the transverse load subjected to the simply supported beam AB of 8m length.

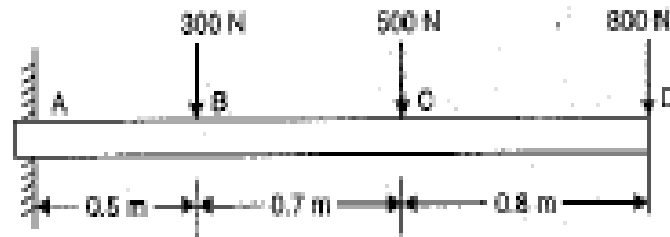


Module 5 Section B

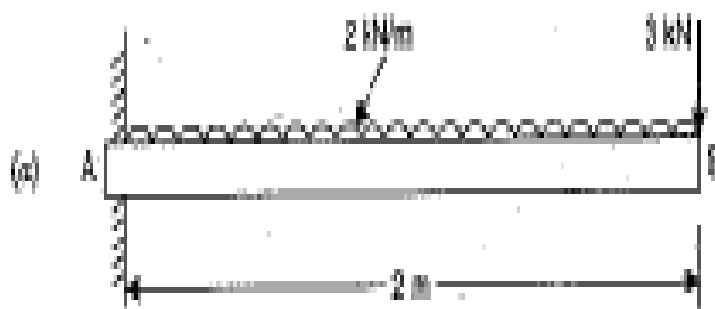
Q10. Determine the centre of gravity of the given channel section of dimension 100 X 50 X 15 mm.



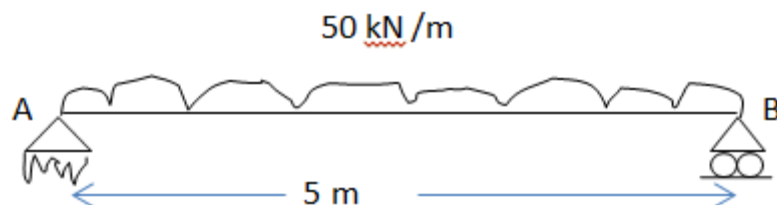
Q11. Draw SF And BM diagram for a cantilever beam of 2m length.



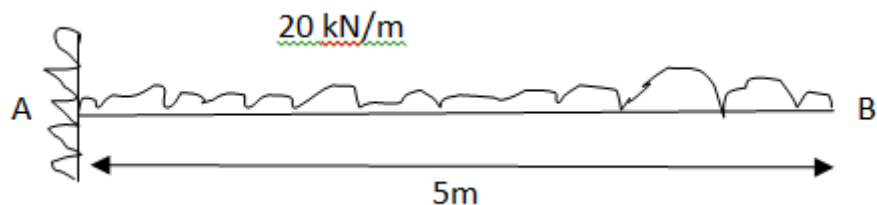
Q12. A cantilever of length of 2.0 m carries a uniformly distributed load of 2 kN/m length over the whole length and a point load of 3 kN at the free end. Draw the S.F. and B.M. diagrams for the cantilever.

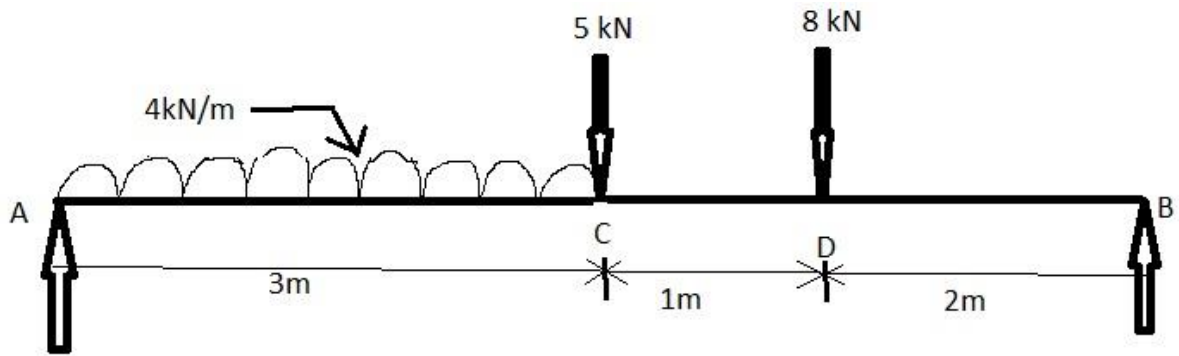


Q13. Draw shear force and bending moment diagram for the following loading.

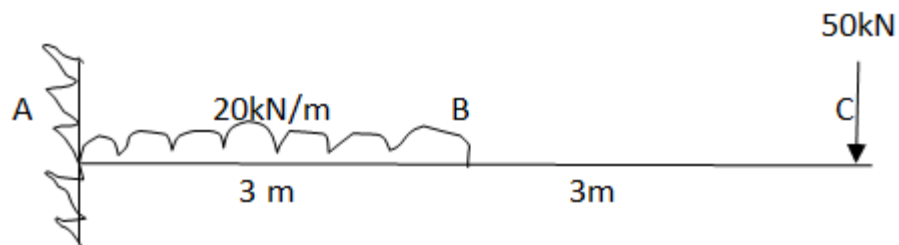


Q14. Draw shear force and bending moment diagrams for the following loadings

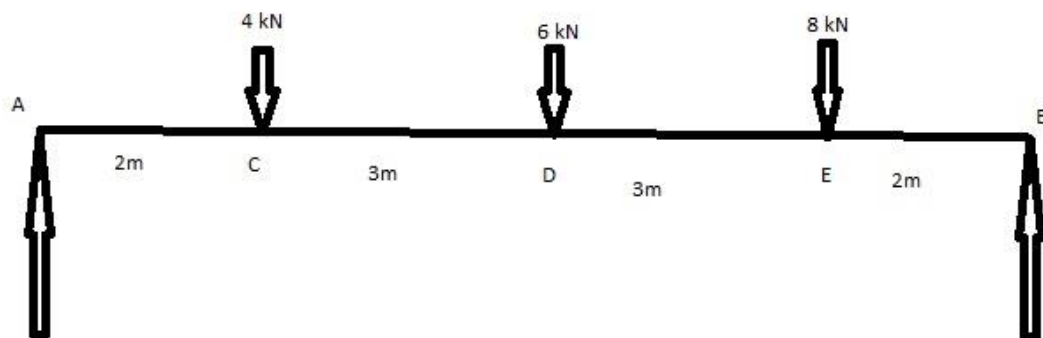




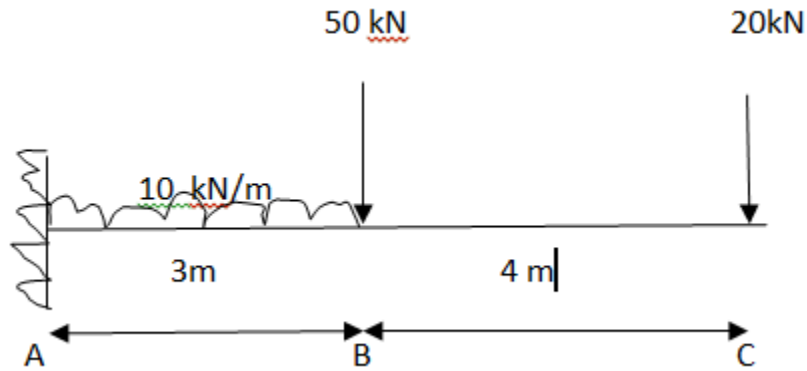
Q15. Draw shear force and bending moment diagram for the following loading.



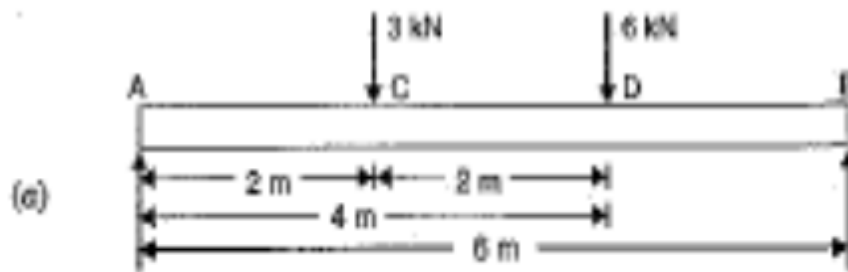
Q. Draw Shear Force and Bending Moment Diagrams for given loading.



Q16. Draw Shear force and Bending Moment Diagrams for the following .

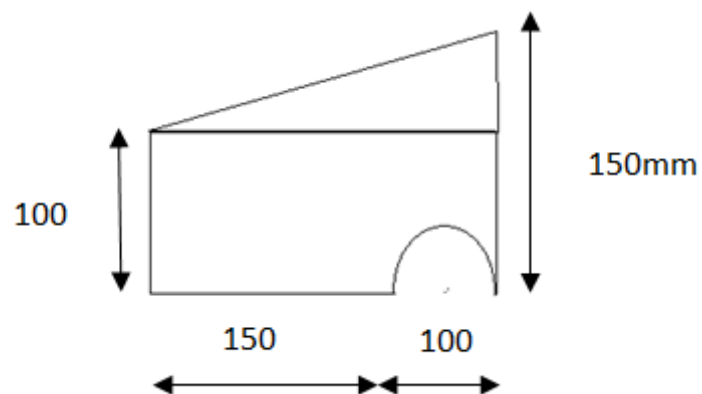


Q17. Draw the shear force and bending moment diagram for a simply supported beam of length 6 m and carrying two point loads of 3 kN and 6 kN at 2m and 4 m from end A. Also calculate the maximum B.M on the section.

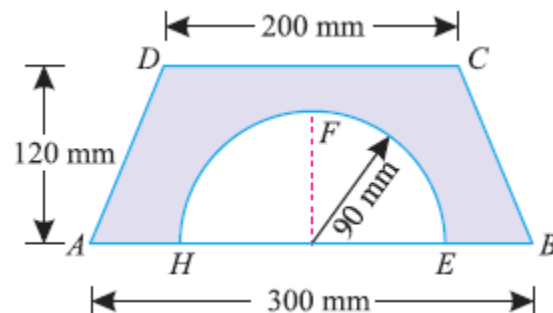


Module 5 Section C

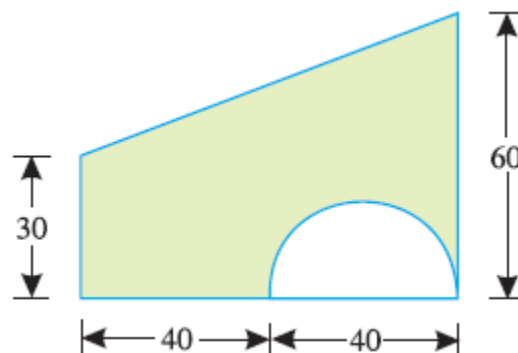
Q18. Find C.G. of the following figure.



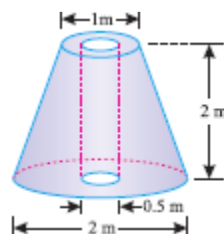
Q19. A semi circle of 90 mm radius is cut out from a Trapezium, find the position of centre of gravity of the figure.



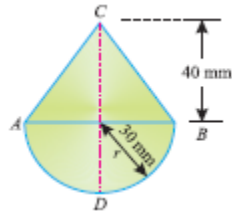
Q20. A semi-circle of 40 mm diameter is cut out from a Trapezium, as shown in the figure. Find the position of centre of gravity of the figure.



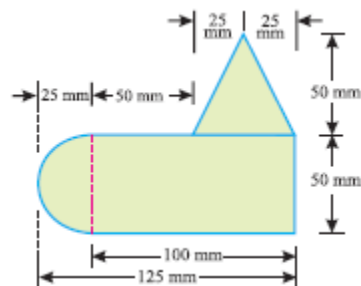
Q21. A frustum of a solid right Circular cone has an axial hole of 50 cm diameter as shown in the figure. Determine the centre of gravity of the body.



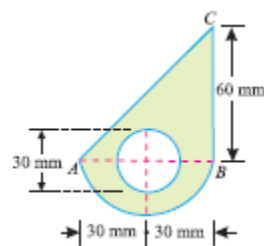
Q22. A body consist of a right solid circular cone of height 40 mm and radius 30mm placed on solid hemisphere of radius 30mm of the same material . find the position of the centre of gravity of the body .



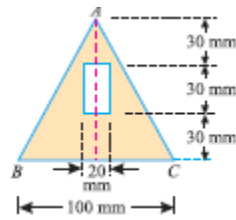
Q23. A uniform lamina shown in figure consists of a rectangle, a circle and a triangle. Determine the centre of gravity of the lamina.



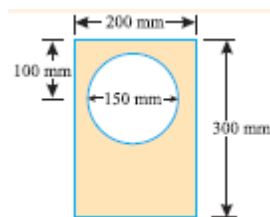
Q24. Find the moment of inertia of the lamina with a circular hole of 30 mm diameter about the axis AB as shown in the figure.



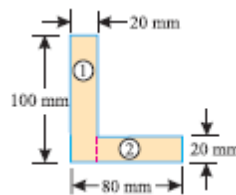
Q25. A rectangular hole is made in a triangular section as shown in the figure. Determine the moment of inertia of the section about axis passing through its centre of gravity and the base BC.



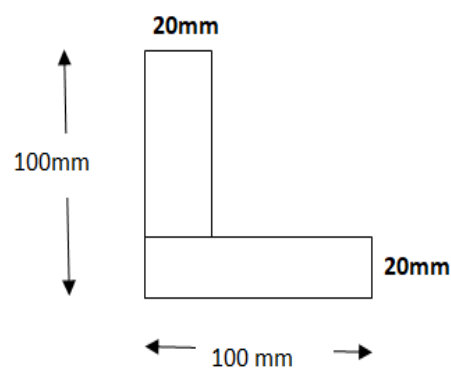
Q26. Find the moment of inertia of a hollow section as shown in the figure, about an axis passing through its centre of gravity and parallel to X-X axis.



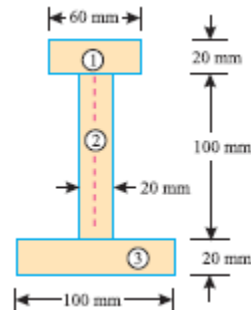
Q27. Find the moment of inertia about the centroidal X-X and Y-Y axis of the angle section shown in the figure.



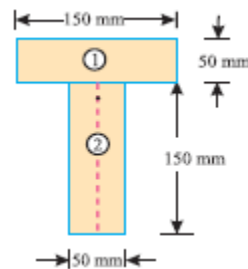
Q28. An L-section is shown in the figure .100mmx100mm and thickness of 20 mm, find centre of gravity of the Section given below.



Q29. A section is made-up of three rectangles as shown in the figure. Find the moment of inertia of the section about the horizontal axis passing through the centre of gravity of the section.



Q30. find the moment of inertia of a T-section with a flange as 150 mm X 50 mm and a web as 150 mm X 50 mm about the X-X axis and Y-Y axis through the centre of the gravity of the section.



Q31. A cast iron beam section shown in the figure. Determine the moment of inertia of the section about the horizontal and vertical axis passing through the centroid of the section.

