

CBCS SCHEME

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18ENG15

First Semester B.Arch. Degree Examination, Aug./Sept.2020 Building Structures – I

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Follow the written dimension, do not scale.

Module-1

- 1 a. Explain the following with example:
(i) Dead load (ii) Live load (iii) Horizontal loads (iv) Impact load. (12 Marks)
b. What is workability of concrete? What are the factors that would affect the property of workability? (08 Marks)

OR

- 2 a. What are the properties of concrete, steel? (10 Marks)
b. What are tests conducted on fresh and hardened concrete? (05 Marks)
c. What are admixtures used in concrete. (05 Marks)

Module-2

- 3 a. Differentiate between
(i) Rigid body and Deformable body
(ii) Concurrent force system and collinear force system
(iii) Resultant of a force and equilibrant
(iv) Law of triangle of force and law of polygon of forces (10 Marks)
b. Determine the magnitude of F for the resultant of forces shown to be an angle of 15° with respect to x axis. Also determine the magnitude of resultant. [Refer Fig.Q3(b)]

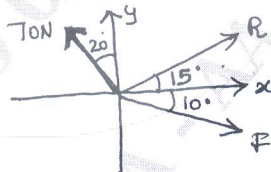


Fig.Q3(b)

(10 Marks)

OR

- 4 a. What are statically determinate beams and statically indeterminate beams? Explain with examples. (06 Marks)
b. What is Varignon's theorem? (02 Marks)
c. Parallel forces F_1 , F_2 , 2 kN and 10 kN have a downward resultant of 5 kN and it acts at a distance of 1.8 mts from A. Determine the values of F_1 and F_2 . [Refer Fig.Q4(c)]

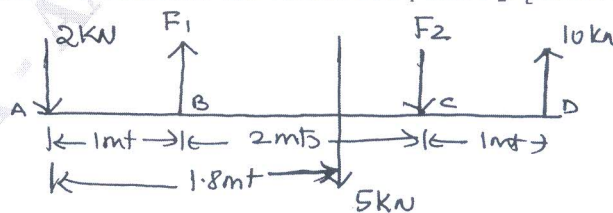


Fig.Q4(c)

(08 Marks)

d. What is free body diagram? Write free body diagram for following cases:

(i) Ball kept on the table

(ii) Beam resting on a Hinge at one end and Roller at other end.

(04 Marks)

Module-3

5 For the following cases shown in the Fig.Q5(i) and Fig.Q5(ii), determine the magnitude, direction and line of action of the resultant force.

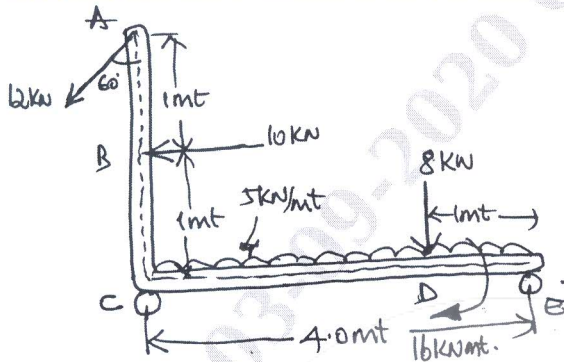
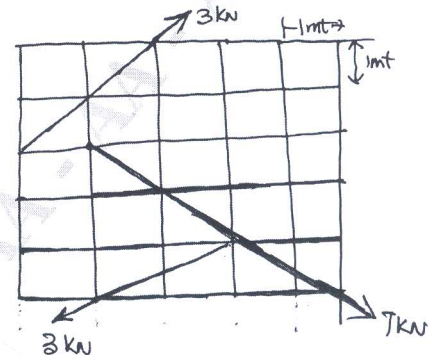


Fig.Q5(i)



[Each Block is 1 m × 1 m]

Fig.Q5(ii)

(20 Marks)

OR

6 a. What are different types of supports briefly explain with sketches.

(08 Marks)

b. Determine the support reactions at A and B. Refer Fig.Q6(b).

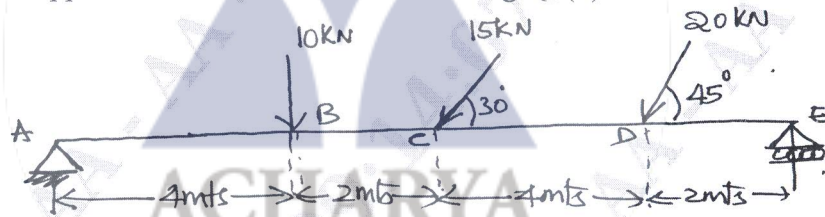


Fig.Q6(b)

(12 Marks)

Module-4

7 Locate the centroid for the composite section shown in below in Fig.Q7(i) and Fig.Q7(ii).

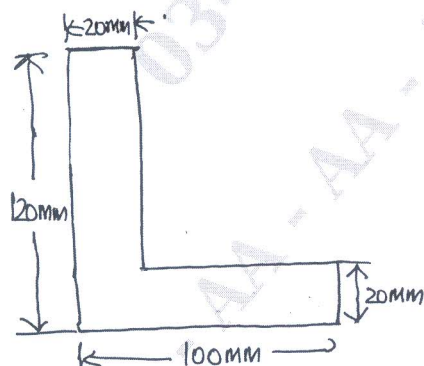


Fig.Q7(i)

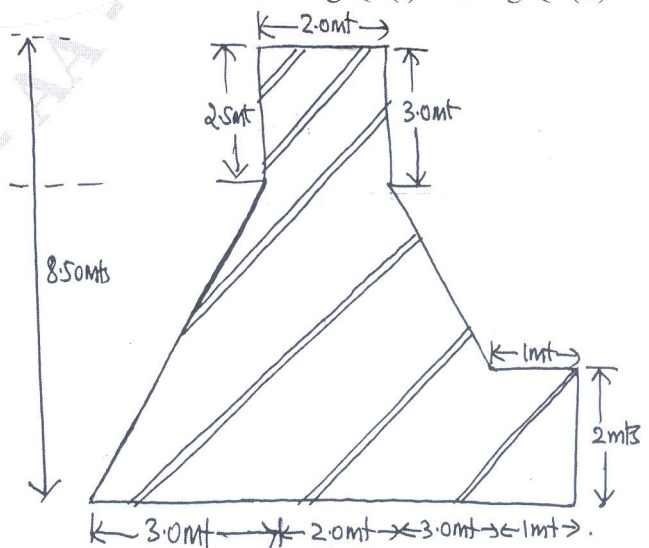


Fig.Q7(ii)

(20 Marks)

OR

- 8 a. State and prove Parallel Axis theorem. (06 Marks)
 b. Determine the moment of inertia about both horizontal and vertical centroidal axis. Refer Fig.Q8(b).

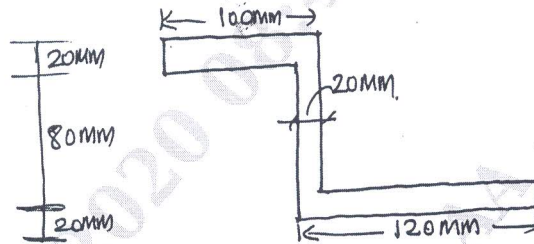


Fig.Q8(b)

(14 Marks)

Module-5

- 9 a. With examples explain briefly the following :
 (i) Perfect frame (ii) Deficient frame (iii) Redundant frame (09 Marks)
 b. What are the assumptions made in Analysis of Truss? (05 Marks)
 c. Determine the support Reactions for the Truss shown in Fig.Q9(c).

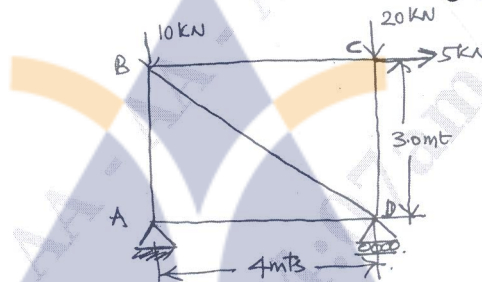


Fig.Q9(c)

(06 Marks)

OR

- 10 Determine the forces in the truss shown in Fig.Q10, which is subjected to horizontal and vertical loads. Mention the nature of forces in each case by Method of Joints.

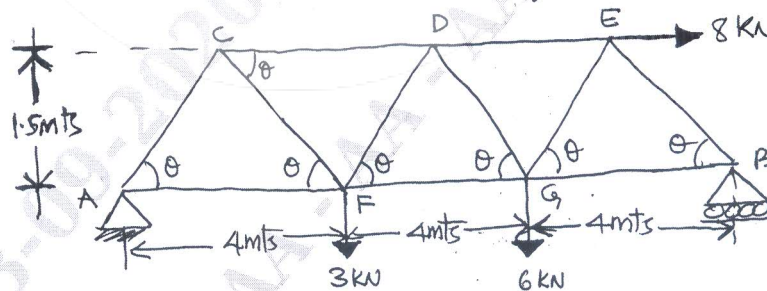


Fig.Q10

(20 Marks)
