Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

Roll No .....

AR-125-CBGS

B.Arch. II Semester

Examination, June 2020

Choice Based Grading System (CBGS)

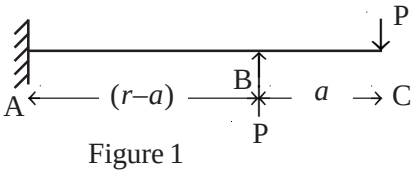
Structure - II

Time : Three Hours

Maximum Marks : 50

Note : i) Attempt any five questions.
ii) All internal parts of question shall be solved in continuation.
iii) Supplement your answer with neat sketches, wherever necessary.

1. a) Draw BM diagram for beam shown below. 3



Downward load P at pt. C and Upward load P at pt. B

Figure 1

Also draw SF diagram

b) Explain in 125 words about properties of shear force and bending moment diagrams. 3

c) Draw bending and shear force diagram for below mentioned beam. 4

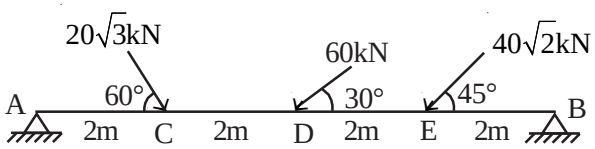
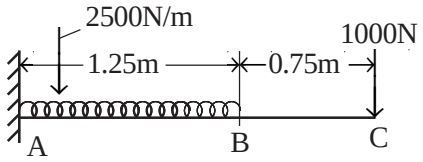


Figure 2

2. a) With the help of first principle derive equation

$$M = EI\left(\frac{d^2y}{dx^2}\right)$$ 3

b) A cantilever of length 2 meters carries a uniformly distributed load of 2500N/m for a length of 1.25m from the fixed end and a point load of 1000N at the free end. If section of beam is rectangular (120mm W × 240mm deep). Find deflection and slope at points AB and C. 3



$E = 10000N/mm^2$

Figure 3

c) Explain about Clapeyron's theorem of three moments. 4

3. a) A fixed beam AB of span and is subjected to a concentrated couple Mo applied at C at a distance a from the end A. Find values of end moments at each support/end. 3

b) Explain the terms: Absolute and relative stiffness of members, distribution factor, carry over factor. 3

c) Determine support moments for the continuous beam (Shown in below mentioned figure) by moment distribution method. EI is same through-out. 4

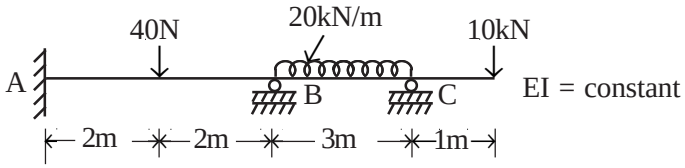
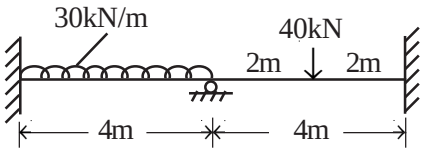


Figure 4

4. a) Determine the support moments of the beam shown in figure 5. EI constant throughout. 5



EI is constant

Figure 5

b) Explain following terms: 5
Rigid joint, Pin joint, determinate structures, Indeterminate structures, Portal framed structures.

5. a) Prove that for triangular or rectangular Dam/Retaining wall section, minimum bottom width required to avoid tension is $H/\sqrt{S}$ where H = Height of Dam and S = Specifical gravity of masonry used in construction. 5

b) State various assumptions mode in theory of earth pressure (Rankine). 5

6. a) A masonry rataining wall with vertical face is 5.0m high its width at the top is 1m and at the base is 3.0m. Weight of masonry used is 20kN/m^3. Up to what height a soil weighing 15kN/m^3 can be retained by this wall, so that maximum pressure at the base is 1.2 times the minimum pressure at the base. Angle of repose of the soil is 30°. 5

b) Describe about various types of loads and forces that are subjected to structures. Also describe about various load combinations for getting critical combination of loads for design. 5

7. Analyse the truss and find member forces, considering pinned joints in all members (use any suitable method). 10

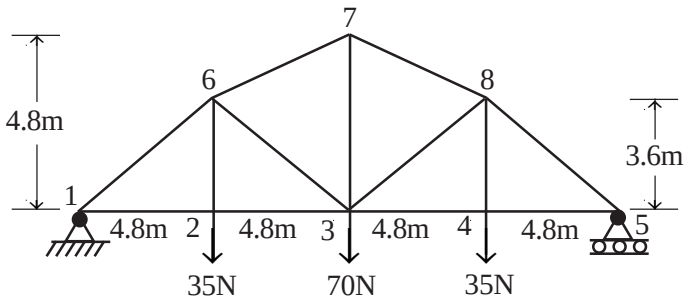


Figure 6

8. Write explanatory notes on any three (maximum 125 words) 10
   i) Method for calculating seismic forces as per IS 1893-2002.
   ii) Method for calculating wind forces as per IS:875 s(Part III)
   iii) Different types of live load and their common values as per IS:875 Part II and IV
   iv) Why reduction of live loads is done for columns of multistory structures.

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