

Mahatma Education Society's
PILLAI'S COLLEGE OF ARCHITECTURE
Sector-16, Plot No.10, New Panvel-410 206
SECOND YEAR B.ARCH: REPEATER EXAM 2011
THEORY OF STRUCTURES

TIME: 3 HRS

DATE: 21-07-2011

MAX. MARKS 100

- NOTES:** 1) ALL QUESTIONS CARRY 16 MARKS EACH.
2) SOLVE ANY THREE QUESTIONS FROM EACH SECTION.
3) DRAW SKETCHES WHEREVER NECESSARY.
4) FOUR MARKS ARE RESERVED FOR NEAT SKETCHES.

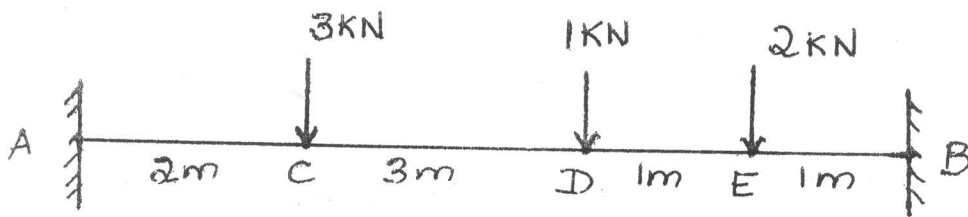
SECTION A

- Q.1 a) Write a note on different types of foundations and draw sketches.
b) Define the following. (Any Three):-
I) Void Ratio II) Bulk Density III) Liquid Limit IV) Plastic Limit
- Q.2) A fixed beam AB of 7 m span is loaded as shown in **FIG 1**. Calculate the values of shear force and bending moment, also draw shear force diagram & bending moment diagram.
- Q.3) A continuous beam ABCD is loaded as shown in **FIG 2**. Find the moments, Also find the reactions and draw Shear Force & Bending Moment Diagrams. [USE MOMENT DISTRIBUTION METHOD ONLY.]
- Q.4) A continuous beam ABCD has both ends simply supported and is loaded as shown in loaded as shown in **FIG.3**. Calculate the moments, reactions, also draw shear force and bending moment diagram. [USE THREE MOMENT THEOREM ONLY.]
- Q.5) Find Euler's crippling load & load by Rankine's formula for a hollow cylindrical column having 38mm external diameter & 2.5m thickness. The original length of the column is 2.3m, with both ends hinged.
 $E = 205 \text{KN/mm}^2$, $f_c = 335 \text{N/mm}^2$, $a = 1/7500$.

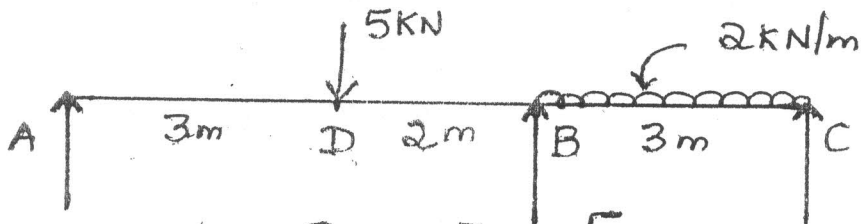
SECTION B

- Q.6) a) Why is de-watering of soil necessary before foundation? State the methods of dewatering & explain any one method with sketch.
- b) Write a note with sketch about the test in accessing the load bearing capacity of soil.
- Q.7) The cross section of a soil retaining wall is as shown in FIG 4. If the density of wall is 24 KN/m^3 , density of soil is 19 KN/m^3 , co-efficient of friction is 0.55 & angle of repose is 32° . Find the maximum & minimum stresses at the base. Also state the stability of the wall.
- Q.8) The cross section of a column is as shown in FIG 5. There is an eccentric load of 60 KN as shown. Find the stresses at the corners of column. What additional load is required for no tension at any of the corners. With this additional load what are the stresses at the corners.
- Q.9) For a portal frame loaded as shown in FIG 6. Find moments and reactions at A and D. Also draw B.M.D
- Q.10) a) A simply supported wooden beam 140 mm width & 240 mm deep has a span of 4.0 m. Determine the point load that can be placed at the centre of the beam which can produce maximum deflection of 10mm at the centre. $E = 6 \times 10^3 \text{ N/mm}^2$.
- b) A simply supported beam is 100 mm wide & 240 mm deep. It carries a uniformly distributed load of 2251 N/m on the entire span of 4m. Find the deflection produced. ($E = 1.1 \times 10^4 \text{ N/mm}^2$)

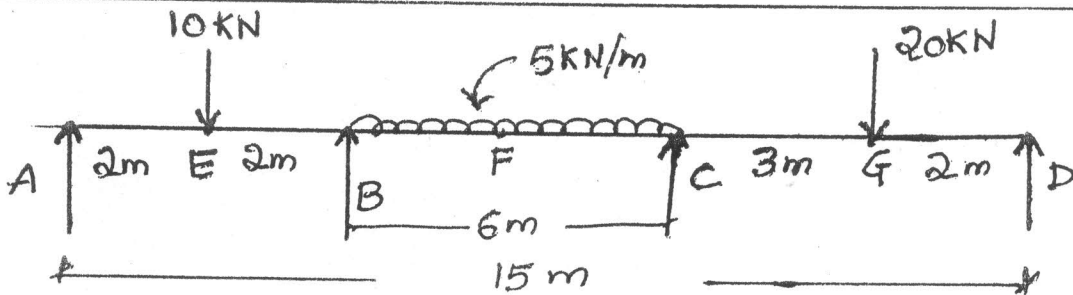
IInd year - FOS - July 2012



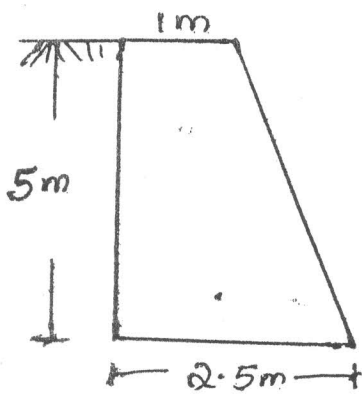
Q.2 [FIG:1]



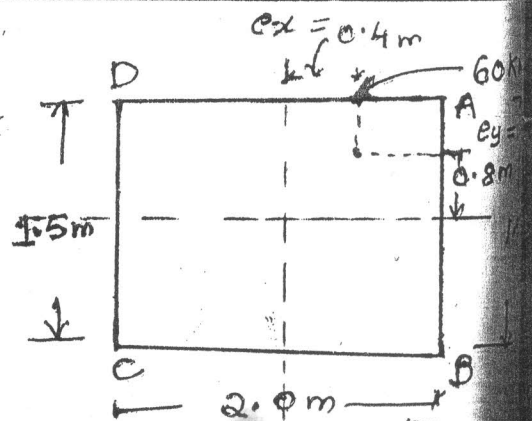
Q.3 [FIG:2] [MOMENT DISTRIBUTION METHOD]



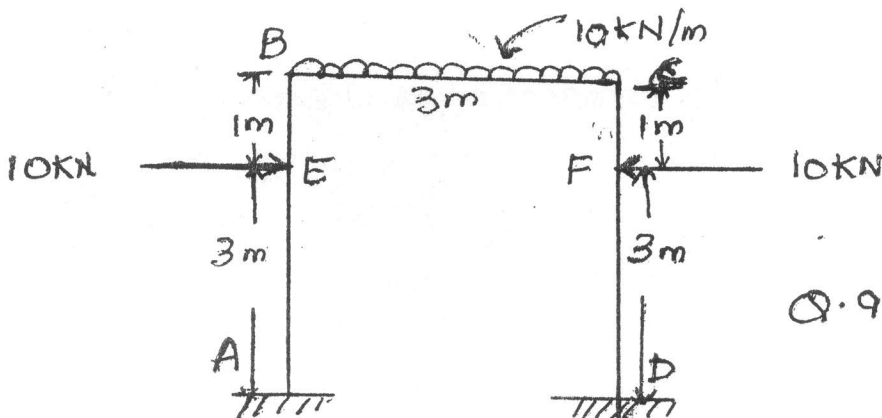
Q.4 [FIG:3] [USE T.M.T. METHOD]



Q.7 [FIG:4]



Q.8 [FIG:5]



Q.9 [FIG:6]