Reg. No. : | | | | | | | | | | |

Question Paper Code: 55101

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2020

Fifth Semester

Civil Engineering

15UCE501 – STRUCTURAL ANALYSIS I

(Regulation 2015)

Duration: One hours Maximum: 30Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Principle of virtual work method is based on the law of CO1- R

   (a) Conservation of energy (b) Conservation of strain energy

   (c) Energy Dissipation (d) None of the above

2. By applying the Equilibrium equations to a determinate structure we can determine CO1- U

   (a) Support reactions only (b) Shear forces only

   (c) Bending moments only (d) All of the above

3. A continuous beam AB subjected to UDL of 20 kN/m then fixed end moment $M_{FAB}$is CO2-R

   (a) 40 kN-m (b) 120 kN-m (c) 60 kN-m (d) 180 kN-m

4. The number of independent equations to be satisfied for static equilibrium of a plane structure is CO2- R

   (a) 1 (b) 2 (c) 3 (d) 6

5. In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always CO3- U

   (a) 0 (b)<1 (c) 1 (d) >1

6. The span AB having 5m length and u.d.l of 20kN/m. Calculate the fixed end moment CO3- R

   (a) 21.67 kN/m (b)41.67 kN/m (c)31.67 kN/m (d) 50 kN/m

7. The maximum bending moment due to a train of wheel loads on a simply supported girder CO4- U

(a) Always occur at centre of span (b) Always occur under a wheel load

(c) Never occur under a wheel load (d) None of the above

8. In a simply supported beam of span 12m, a point load of 100kN is moving from left to right. What is the value of maximum positive shear force at a section of 4m from left support? CO4- R

(a) 66.66 kN (b) 76.66 kN c) 33.33 kN (d) 56.66 kN

9. If a three hinged parabolic arch, (span *l*, rise *h*) is carrying a uniformly distributed load *w*/unit length over the entire span, CO5- U

(a) Horizontal thrust is $wl^2/8h$ (b) S.F. will be zero throughout

(c) B.M. will be zero throughout (d) All of the above

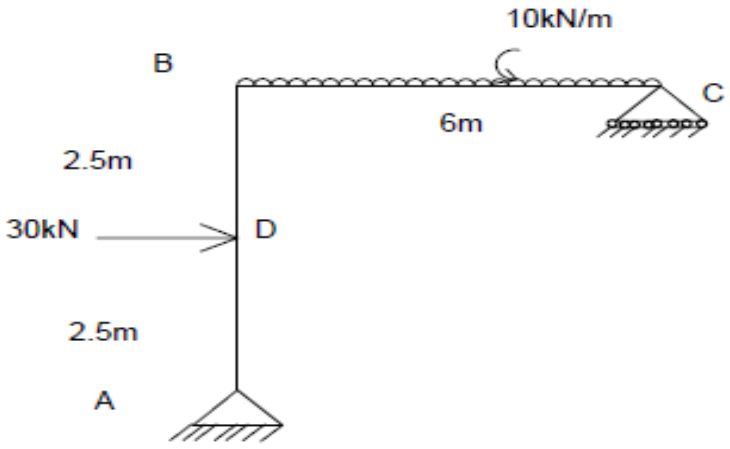
10. Degree of static indeterminacy of a three hinged parabolic arch is CO5- U

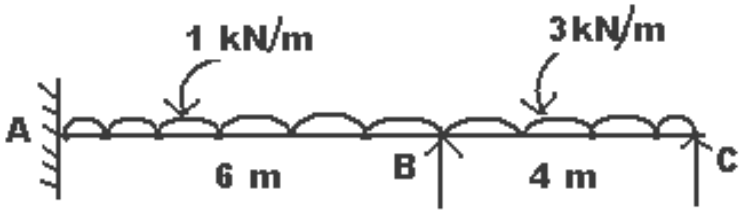
(a) 0 (b) 1 (c) 2 (d) 3

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Analyze the portal frame as shown in fig. Determine the vertical displacement of joint C using principle of virtual work. Take E = 2 x 10^5 N /mm^2 and I = 4 x 10^6 mm^4. CO1- Ana (8)



12.	Analyze the continuous beam ABC shown in figure by slope deflection method and sketch the bending moment diagram. Take EI = constant 	CO2- Ana	(8)
13.	Write the objectives of cost estimation.	CO3- Ana	(8)
14.	Four point loads of 140kN, 160 kN, 180 kN, 90 kN spaced 2m between consecutive loads move on girder 27m span with the 150kN loading leading from left to right. Calculate maximum bending moment at point 14m from left support.	CO4- Ana	(8)
15.	Determine the horizontal thrust developed in a semi circular arch of radius R subjected to a concentrated load W at the crown	CO5- Ana	(8)