Reg. No.													

Question Paper Code	11898

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Sixth Semester

Civil Engineering

20CEPC603 – STRUCTURAL ANALYSIS II

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

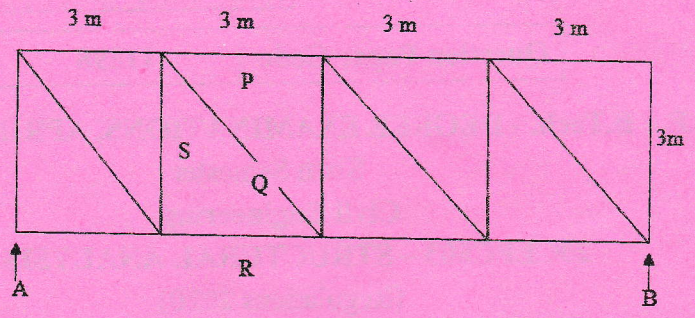
		Marks, K-Level, CO
1.	List the uses of Influence Lines.	2,K1,CO1
2.	Where do you get rolling loads in practice?	2,K2,CO1
3.	Define Absolute Maximum Bending moment.	2,K1,CO2
4.	In a parallel chord truss, the force in a vertical member is a function of .....in the Panel?	2,K1,CO2
5.	State Muller Breslau's Principle.	2,K1,CO3
6.	Draw influence lines (qualitative) for bending moment in middle support of a continuous beam having two equal parts.	2,K2,CO3
7.	Write the types of arches based on the number of hinges.	2,K1,CO4
8.	What is the degree of static indeterminacy of the fixed arch?	2,K1,CO4
9.	Classify the different types of mechanisms.	2,K2,CO6
10.	Define collapse load.	2,K1,CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Draw the ILD for shear force and bending moment for a section at 5m from the left hand support of a simply supported beam, 20m long. Hence, calculate the maximum bending moment and shear force at the section, due to a uniformly distributed rolling load of length 8m and intensity 10kN/m run.	13,K3,CO1
		OR	
	b)	A girder having a span of 18m is simply supported at the ends. It is traversed by a train of loads 100kN, 200kN, 100kN and 50kN with 3m, 2m and 3m spacing respectively and 50kN load is leading. Find the maximum Bending moment (i) under 200kN load and (ii) 50kN load.	13,K3,CO1

12. a) Draw ILD for forces in P, Q, R and S *13,K3,CO2*



OR

b) Explain step by step procedure in drawing the ILD for forces in members of a truss. *13,K2,CO2*

13. a) Draw the IL for reaction at B and for the support moment M_A at A for the propped cantilever AB of length 10 m. Compute the IL ordinates at every 1.5 m interval. *13,K3,CO3*

OR

b) Determine the influence line for R_A for the continuous beam ABC, roller at A and C with hinge support at B. Compute the IL at every 1m interval. AB = BC = 5m. *13,K3,CO3*

14. a) A parabolic 3 hinged arch of span 20 m carries point load of 20kN and 30kN at 3m and 7m from the left end and an udl of 25kN/m over the right half of the span. Find the bending moment, normal thrust and radial shear at D, 5m from A. What is the maximum bending moment? *13,K3,CO4*

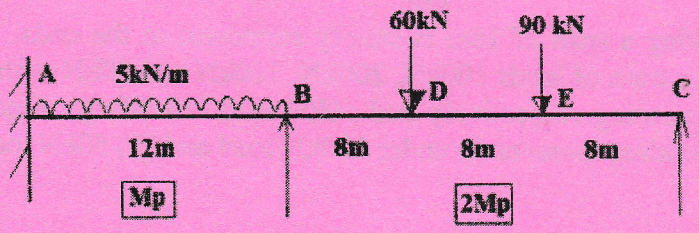
OR

b) A parabolic 3 hinged arch carries a UDL of 25 kN/m on the left half of the span. It has a span of 16 m and a central rise of 3 m. Determine the resultant reaction at supports. Find also the bending moment, normal thrust and radial shear at a section 4 m from left support. *13,K3,CO4*

15. a) Calculate the shape factor for a i) Rectangle section of breadth 'b' and depth 'd', ii) Diamond section of breadth 'b' and depth 'd'. *13,K3,CO6*

OR

b) A continuous beam ABC is loaded as shown in the Fig. Examine the required Mp if the load factor is 3.2. *13,K3,CO6*



PART - C (1 × 15 = 15 Marks)

16. a) A suspension bridge of 250m span has two numbers of three hinged stiffening girder supported by cables with a central dip of 25m. If 4 point load of 300kN each are placed at the centre line of the roadway at 20, 30, 40 and 50m from the left hand hinge, Estimate the shear force and bending moment in each girder at 62.5m from each end. Estimate also the maximum tension in the cable. *15,K3,CO5*

OR

b) A three hinged stiffening girder of a suspension bridge of 100 m span subjected to two point loads 10 kN each placed at 20 m and 40 m, respectively from the left hand hinge. Determine the bending moment and shear force in the girder at section 30 m from each end. Also determine the maximum tension in the cable which has a central dip of 10 m. *15,K3,CO5*