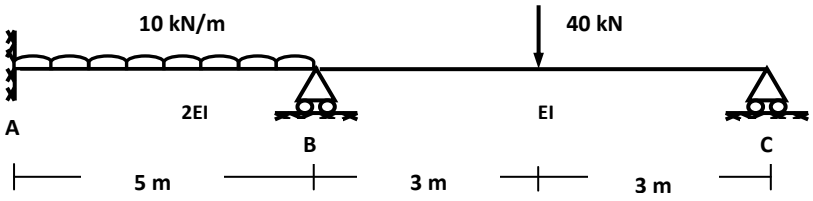
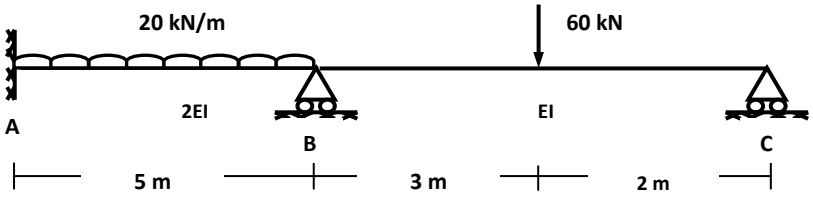
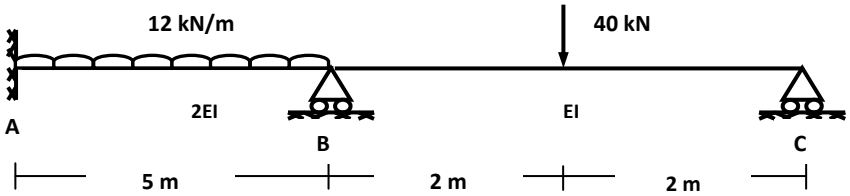
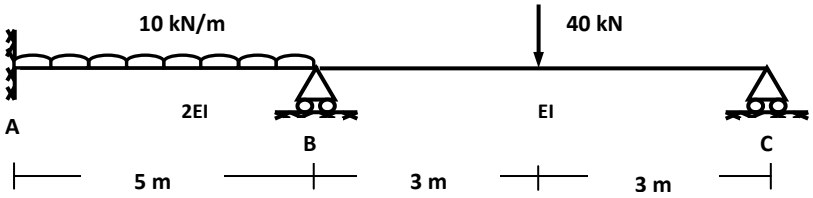
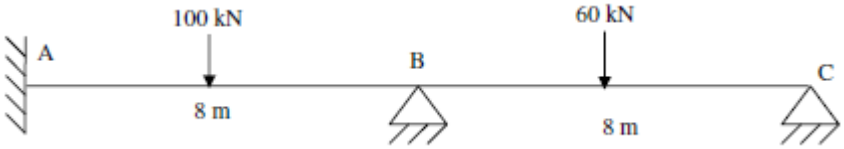
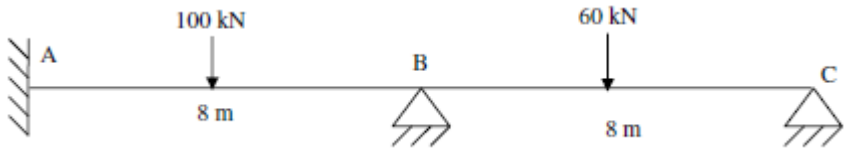
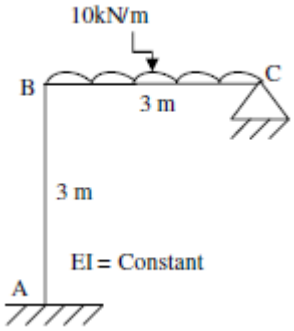
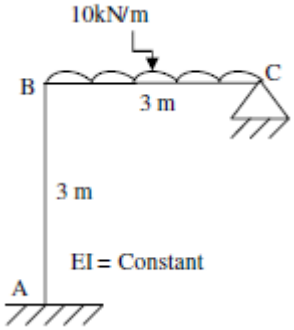
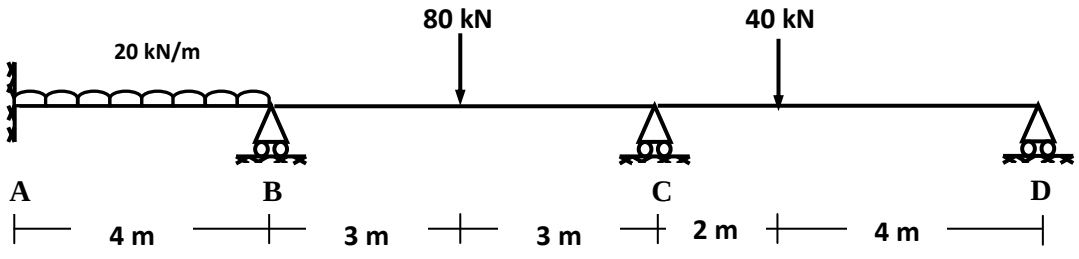
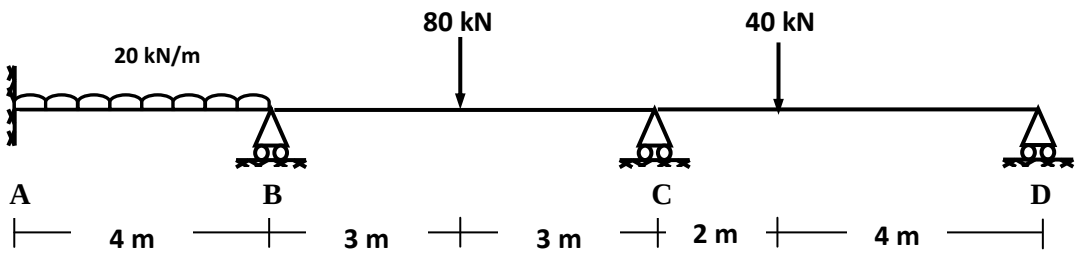
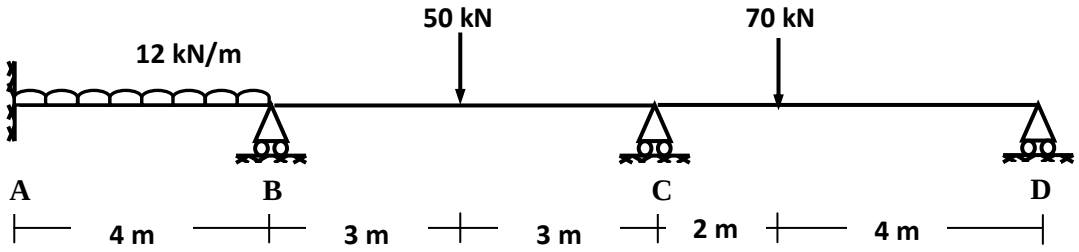
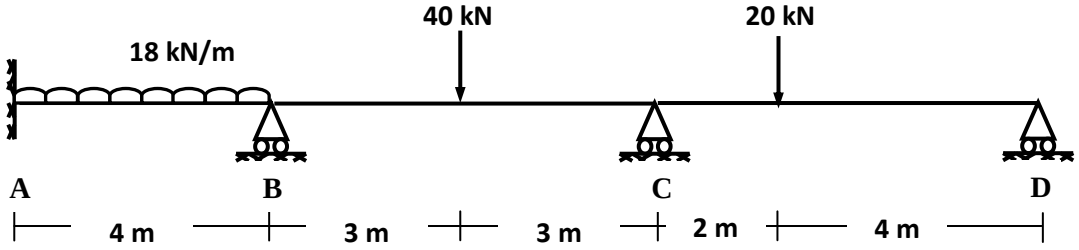
BE Semester-V (Civil Engineering) Question Bank
(Structural Analysis-II)

- **All questions (Que. 1 to 30) carry equal marks (10 marks)**
- **All questions (Que. 31 to 35) carry equal marks (20 marks)**

Q.1	Explain carry over factor, carry over moment, stiffness and distribution factor.
Q.2	Explain types of domes with neat sketches and state their uses.
Q.3	What is an influence line diagram? Explain its importance in structural analysis.
Q.4	Derive equations for stresses for a spherical dome subjected to udl over entire surface area.
Q.5	Derive equations for stresses for a spherical dome subjected to point load of 'W' on its crown point.
Q.6	Explain with neat sketches Stresses generated in Conical Dome subjected to udl.
Q.7	Differentiate between stiffness method and flexibility method.
Q.8	Explain characteristics of stiffness and flexibility matrix.
Q.9	Draw influence line diagrams for V_A, V_B for a propped cantilever beam of span 10 m at 1 m intervals.
Q.10	Draw influence line diagrams for M_A, Shear force and bending moment at 'X' for a propped cantilever beam of span 10 m at 1 m intervals. Consider section 'X' at 4 m from left end support.
Q.11	A spherical dome has 6 m span and 1.25 m rise. It is subjected to load of 600 N/m^2, including self weight and a lantern load of 800 N at crown. Take thickness as 150 mm. Calculate stresses in the dome.
Q.12	A three hinged parabolic arch carries a uniformly distributed load of 30 kN/m on the left half of the span. The arch has a span of 16 m and central rise of 3 m. Determine the bending moment, normal thrust and radial shear at 2 m from the left support.
Q.13	Write the equations of Euler's crippling load for different column end condition.
Q.14	A conical dome has 9 m span and 4.5 m rise. It has a thickness of 100 mm. It is subjected to load of 4900 N/m^2, including self weight. Calculate stresses in the dome.
Q.15	Calculate the load carrying capacity using Euler's and Rankine's Formula for a rectangular column having 300 mm x 400 mm size and 4 m length. The ends of the column are fixed. Take E = 1.6 x 10^5 N/mm^2 , Rankine's Constant = 1/1600, fc = 250 N/mm^2
Q.16	List various assumptions made in Euler's formula.
Q.17	Explain the terms. (i) shape factor (ii) collapse load
Q.18	A three hinged parabolic arch of span l and rise h carries a uniformly distributed load over its entire span. Show that the arch is not subjected to any bending moment at any section.
Q.19	A 3m long hollow cylindrical cast iron column of external diameter 150mm and internal diameter 120mm is hinged at one end whereas its other end is fixed. Find the strength of column as per (i)Euler's formula and (ii) Rankine's formula Also determine at what length of column, the strength by both formulae will be same. Take modulus of elasticity E = 8 x 104 MPA, Crushing stress fc = 550 MPa and Rankine's Constant α = 1/1600
Q.20	A three hinged parabolic arch of 18metre span and 3m central rise carries a point load of 6kN at 3m horizontally from the left hand hinge. Calculate the maximum positive and negative bending moment. Aso draw the bending moment diagram.

Q.21	A three hinged circular arch of span 16 m and central rise 4 m is subjected to a central point load of 100 kN on left half span. Calculate support reactions and maximum negative bending moment.
Q.22	Analyse the beam as shown in **Figure** below and draw BMD. Use Slope Deflection Method. 
Q.23	Analyse the beam as shown in **Figure** below and draw BMD. Use Moment Distribution Method. 
Q.24	Formulate displacement matrix for a beam as shown in figure below Using Stiffness Method. 
Q.25	For a beam as shown in **Que-24,** calculate support reactions and draw shear force and bending moment diagram using stiffness method..
Q.26	Analyse the beam as shown in **Figure** below and draw BMD. Use Flexibility Method. 
Q.27	Analyse the beam as shown in **Figure** below and draw BMD. Use Slope Deflection Method. 

Q.28	Analyse the beam as shown in **Figure** below and draw BMD. Use Moment Distribution Method. 
Q.29	Analyse the plane frame as shown in **Figure** below and draw BMD. Use Moment Distribution Method. 
Q.30	Analyse the plane frame as shown in **Figure** below and draw BMD. Use slope deflection Method. 
Q.31	Analyse the beam as shown in **Figure** below and draw BMD. Use Moment Distribution Method. 
Q.32	Analyse the beam as shown in **Figure** below and draw BMD. Use Slope Deflection Method. 

Q.33	Analyse the beam as shown in **Figure** below and draw BMD. Use stiffness method. 
Q.34	Analyse the beam as shown in **Figure** below and draw BMD. Use Flexibility method. 
Q.35	Analyse the truss as shown in **Figure** below. Use Flexibility method.