Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	STRUCTURAL ANALYSIS
COURSE CODE	:	BPD 20403
PROGRAMME CODE	:	BPC
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 A plane truss as shown in **Figure Q1** as in **APPENDIX 1** is supported with pin and roller at point A and B. The point loads imposed are 8kN at point D and 8kN at point F.

(a) Analyse the stability of the plane truss.

(10 marks)

(b) Calculate the internal forces of member GH, HE and DE by using the method of section.

(15 marks)

Q2 A three-member frame as shown in **Figure Q2** as in **APPENDIX 1** is loaded with uniform distributed loads of 10kN/m at points A to B and 25kN/m at points B to C. The frame is pinned support at point A and fixed support at point D.

(a) Analyse the stability of the three-member frame.

(10 marks)

(b) Calculate the internal forces of member AB, BC and CD by using the method of section.

(15 marks)

Q3 A cantilever beam as shown in **Figure Q3** as in **APPENDIX 2** is loaded with 12kN/m triangular distributed load at points A to B and 5kN/m uniform distributed load at points C to D. The cantilever beam also loaded with point loads of 20kN and 10kN at point C and point D respectively.

(a) Calculate reaction forces and bending moment at point A.

(5 marks)

(b) Analyse Shear Force Diagram (SFD) and Bending Moment Diagram (BMD) at point A, B, C and D.

(15 marks)

(c) Calculate the maximum moment.

(5 marks)

Q4 A simply supported beam as shown in **Figure Q4** as in **APPENDIX 2** is subjected to point loads of 10kN and 7kN at points C and D. Given the value of elastic modulus, E = 200kN/mm^2 and moment inertia, I = 10^8mm^4.

(a) Calculate the reaction forces at points A and B.

(5 marks)

(b) Compare with examples the Macaulay method and the Double Integration method for the calculation of deflection of this beam.

(10 marks)

(c) Calculate the deflection at points C and D using Macaulay method.

(10 marks)

- END OF QUESTIONS –

APPENDIX 1

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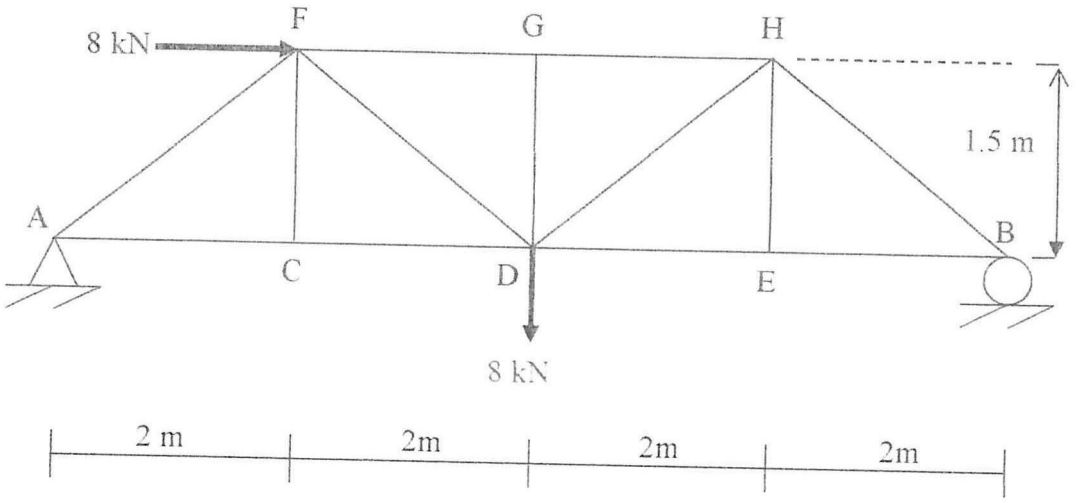

Figure Q1: A Plane Truss

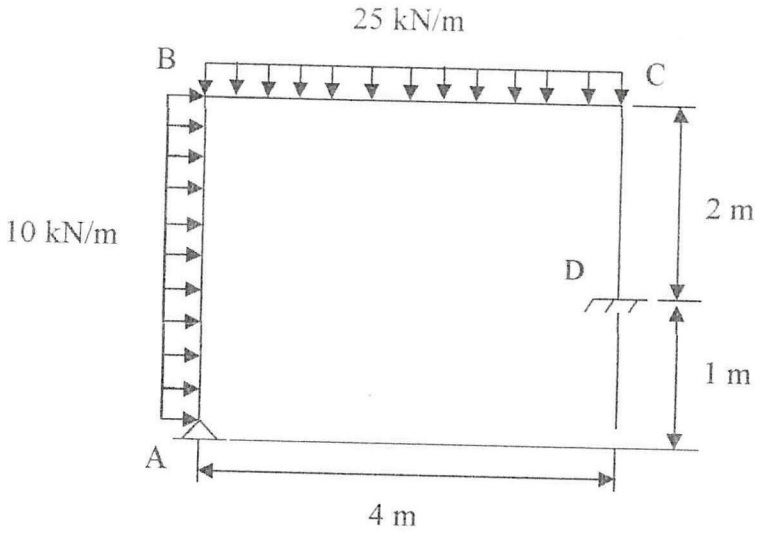

Figure Q2: A Three-Member Frame

APPENDIX 2

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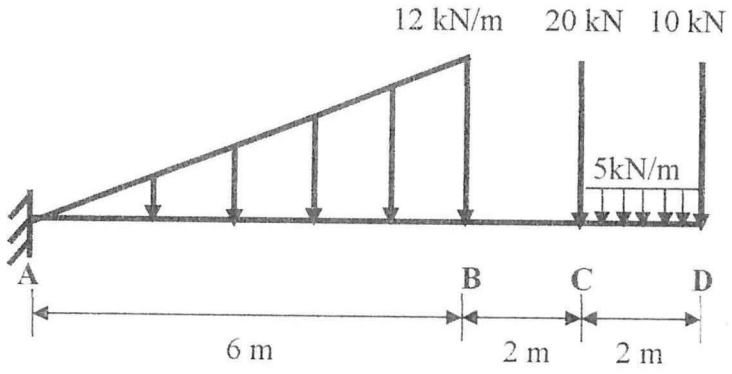

Figure Q3: A Cantilever Beam

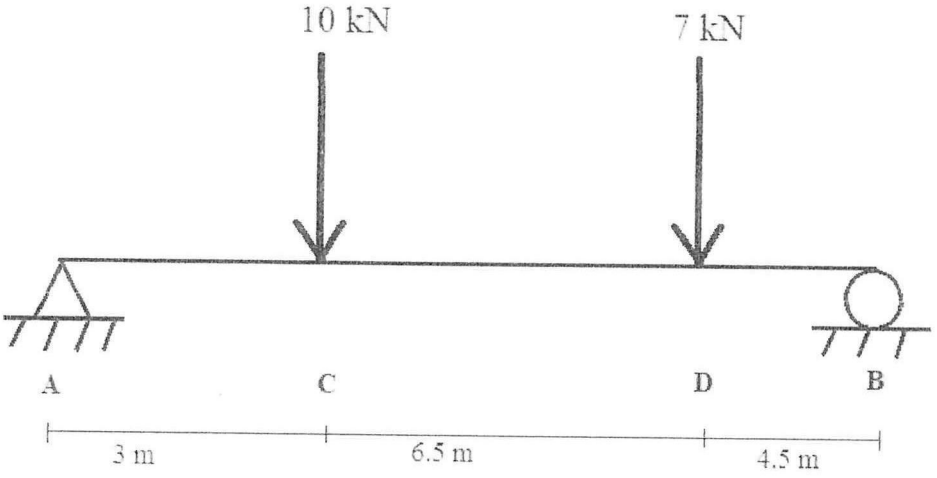

Figure Q4: A Simply Supported Beam