SULIT

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENGAJIAN TINGGI

JABATAN KEJURUTERAAN AWAM

PENILAIAN ALTERNATIF BERIKUTAN
PELAKSANAAN PERINTAH KAWALAN PERGERAKAN BERSYARAT

SESI JUN 2020

DCC5163 : THEORY OF STUCTURE

NAMA PENYELARAS KURSUS : SALIZAWATI BINTI KAMARUZZAMAN

KAEDAH PENILAIAN : PEPERIKSAAN ONLINE

JENIS PENILAIAN : SOALAN STRUKTUR (2 SOALAN)

TARIKH PENILAIAN : 29 JANUARI 2021

TEMPOH PENILAIAN : 1 JAM

LARANGAN TERHADAP PLAGIARISM (AKTA 174)
PELAJAR TIDAK BOLEH MEMPLAGIAT APA-APA IDEA, PENULISAN, DATA ATAU CIPTAAN ORANG LAIN. PLAGIAT ADALAH SALAH SATU PENYELEWENGAN AKADEMIK. SEKIRANYA PELAJAR DIBUKTIKAN MELAKUKAN PLAGIARISM, PENILAIAN BAGI KURSUS BERKENAAN AKAN DIMANSUHKAN DAN DIBERI GRED F DENGAN NILAI MATA 0.
(RUJUK BUKU ARAHAN-ARAHAN PEPERIKSAAN DAN KAEDAH PENILAIAN (Diploma) EDISI 6, JUN 2019, KLAUSA 17.3)

INSTRUCTION:

This paper consists of **TWO (2)** structured questions. Answer **ALL** questions.

ARAHAN:

*Kertas ini mengandungi **DUA (2)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C3

(a) A continuous beam is loaded as shown in **Figure 1(a)**. Calculate internal moment at support A, B and C by using the Slope Deflection Method.

*Satu rasuk selanjar dikenakan tindakan daya seperti yang ditunjukkan dalam **Rajah 1(a)**.Kirakan momen dalaman pada penyokong A, B and C dengan menggunakan Kaedah Cerun Pesongan.*

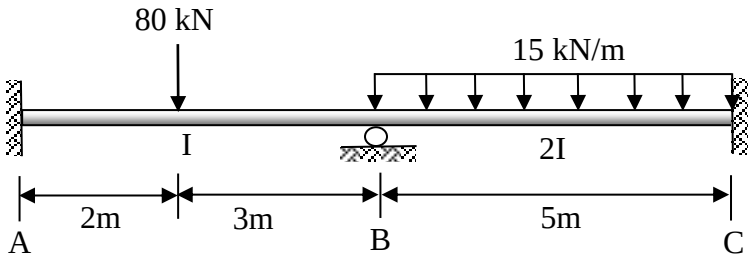


Figure 1(a) / *Rajah 1(a)*

[15 marks]

[*15 markah*]

CLO1
C3

(b) A non-sway portal frame is loaded as shown in **Figure 1(b)**. Sketch the Shear Force Diagram (SFD) and Bending Moment Diagram (BMD), if the internal moment at support is given in **Table 1(b).**

*Sebuah kerangka portal tanpa huyung dikenakan beban seperti ditunjukkan dalam **Rajah 1(b)**. Lakarkan Gambarajah Daya Ricih (GDR) dan Gambarajah Momen Lentur (GML), jika momen dalaman pada penyokong diberikan dalam **Jadual 1(b)**.*

Table 1(b) / *Jadual 1(b)*

No.	Internal Moment / *Moment Dalaman*
1	$M_{AB} = -40.30\ kNm$
2	$M_{BA} = +25.67\ kNm$
3	$M_{BC} = -25.67\ kNm$
4	$M_{CB} = +20.92\ kNm$

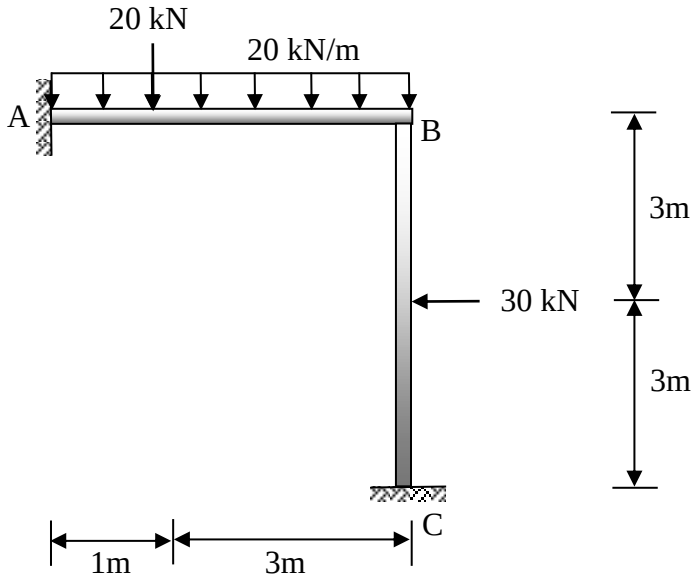


Figure 1(b) / *Rajah 1(b)*

[10 marks]

[*10 markah*]

QUESTION 2

SOALAN 2

CLO3
C4

(a) A simply supported beam is subjected to a series of moving loads as shown in **Figure 2(a)**. By using Influence Line Diagram, analyze the maximum shear force and bending moment at point B due to a series of loads moving from A to C.

*Sebuah rasuk ditupang mudah dikenakan satu siri daya bergerak seperti ditunjukkan dalam **Rajah 2(a)**. Dengan menggunakan Gambarajah Garis Imbas, analisis daya ricih dan momen lentur maksimum di titik B disebabkan oleh pergerakan satu siri beban bergerak dari A ke C.*

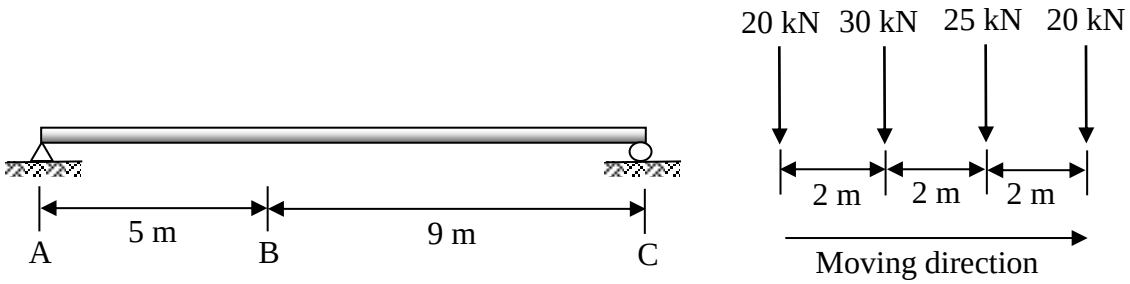


Figure 2(a) / ***Rajah 2(a)***

[15 marks]

[*15 markah*]

CLO3
C5

(b) **Figure 2(b)** shows a simply supported beam is subjected to a series of moving loads 40 kN, 80 kN and 30 kN respectively. Evaluate the Absolute Maximum Moment due to a series of loads moving from left to right by using Influence Line Diagram.

Rajah 2(b) *menunjukan rasuk ditupang mudah dikenakan satu siri daya bergerak masing-masing 40 kN, 80 kN dan 30 kN. Nilaikan Momen Maksimum Mutlak yang disebabkan oleh pergerakan satu siri beban dalam satu arah dari kiri ke kanan dengan menggunakan Gambarajah Garis Imbas.*

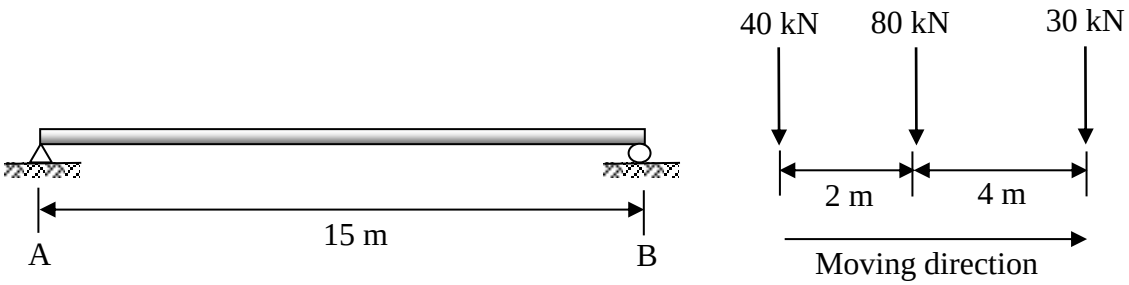


Figure 2(b) / ***Rajah 2(b)***

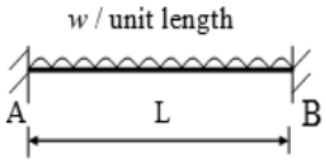
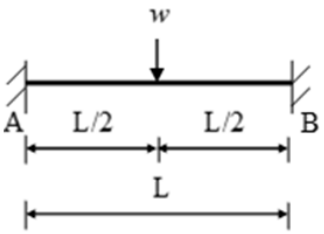
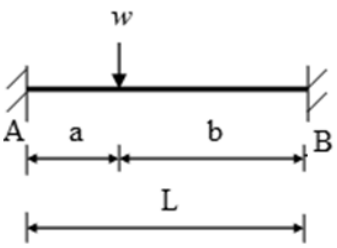
[10 marks]
[*10 markah*]

SOALAN TAMAT

DCC5163 THEORY OF STUCTURE
FORMULAE

<table>
<tr><td colspan="3">1. Slope Deflection Method</td></tr>
<tr><td colspan="3">$M_{AB} = \frac{2EI}{L}(2\theta_A + \theta_B) + FEM_{AB}$
$M_{BA} = \frac{2EI}{L}(2\theta_B + \theta_A) + FEM_{BA}$</td></tr>
<tr><td colspan="3">2. Moment Distribution Method</td></tr>
<tr><td rowspan="2">i. Stiffness Factor</td><td>For fixed or continuous</td><td>$K = \frac{4EI}{L}$</td></tr>
<tr><td>For pinned or roller</td><td>$K = \frac{3EI}{L}$</td></tr>
<tr><td>ii. Distribution Factor</td><td colspan="2">$DF = \frac{K}{\sum K}$</td></tr>
<tr><td colspan="3">3. Statically Indeterminate Truss</td></tr>
<tr><td>i. Redundant Force</td><td colspan="2">$R = \frac{\sum P\mu L/AE}{\mu^2 L/AE}$</td></tr>
<tr><td>ii. Internal Force</td><td colspan="2">$F = P + \mu R$</td></tr>
<tr><td colspan="3">4. Displacement</td></tr>
<tr><td>i. External Load</td><td colspan="2">$\Delta = \frac{\sum P\mu L}{AE}$</td></tr>
<tr><td colspan="3">5. Influence Lines</td></tr>
<tr><td colspan="2">$R_A = 1 - \frac{x}{L}$
$V_C = -\frac{x}{L}$
$M_C = \frac{bx}{L}$</td><td>$R_B = \frac{x}{L}$
$V_C = 1 - \frac{x}{L}$
$M_C = a\left(1 - \frac{x}{L}\right)$</td></tr>
</table>

Table 1: Fixed End Moment (FEM)

$FEM_{AB} = -\frac{wL^2}{12}$		$FEM_{BA} = +\frac{wL^2}{12}$
$FEM_{AB} = -\frac{wL}{8}$		$FEM_{BA} = +\frac{wL}{8}$
$FEM_{AB} = -\frac{wab^2}{L^2}$		$FEM_{BA} = +\frac{wa^2b}{L^2}$