SULIT

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

JABATAN KEJURUTERAAN AWAM

PENILAIAN ALTERNATIF

SESI DIS 2020

DCC5163 : THEORY OF STRUCTURE

NAMA PENYELARAS KURSUS : RAHAYU BINTI HAYAT

KAEDAH PENILAIAN : PEPERIKSAAN ONLINE

JENIS PENILAIAN : SOALAN STRUKTUR (2 SOALAN)

TARIKH PENILAIAN : 14 JULAI 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 section consists of **TWO (2) structured** questions. Answer **ALL** questions.

ARAHAN:
*Bahagian ini mengandungi **DUA (2)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C3

(a) **Figure 1(a)** shows a continuous beam with two spans which are supported at A, B and C. By using Slope Deflection Method, calculate the final moment at support A, B and C.

***Rajah 1(a)** menunjukkan rasuk selanjar yang disokong mudah pada penyokong A, B dan C. Dengan menggunakan Kaedah Cerun Pesongan, kirakan momen akhir pada penyokong A, B dan C.*

[15 marks]
[15 markah]

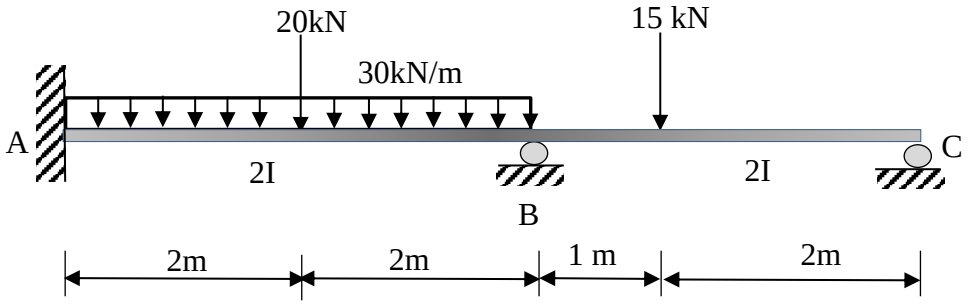


Figure 1(a)/ *Rajah 1(a)*

CLO1
C3

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

*Kerangka portal tanpa huyung dikenakan beban seperti ditunjukkan dalam **Rajah 1(b)**. Lakarkan Gambarajah Daya Ricih (GDR) dan Gambarajah Momen Lentur(GML). Nilai momen dalaman pada setiap penyokong diberi dalam **Jadual 1(b).***

[10 marks]

[10 markah]

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

M_{AB}	M_{BA}	M_{BC}	M_{CB}	M_{BD}	M_{DB}
20 kNm	40 kNm	-40 kNm	41.91 kNm	-41.91 kNm	-20.95 kNm

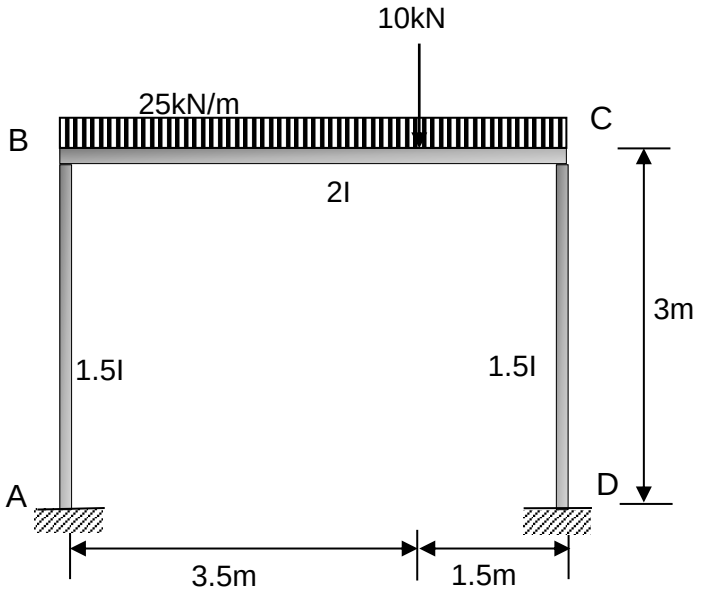


Figure 1(b) / *Rajah 1(b)*

QUESTION 2

SOALAN 2

A simply supported beam of 12m span is subjected to a series of concentrated loads as shown in **Figure 2(a)** below. By using Influence Line Diagram:

*Satu rasuk ditupang mudah sepanjang 12m dikenakan satu siri beban tumpu ditunjukkan dalam **Rajah 2(a)**. Dengan menggunakan Gambarajah Garis Imbas;*

CLO3 C4

(a) Analyse the maximum shear force and bending moment at point C due to a series of loads moving from right to left.

Analisis daya ricih dan momen lenturan maksima pada titik C yang disebabkan oleh pergerakan satu siri beban dalam arah kanan ke kiri.

[15 marks]
[15 *markah*]

CLO3 C5

(b) Evaluate the absolute maximum moment due to a series of loads moving from right to left.

Nilaikan momen maksima mutlak yang disebabkan oleh pergerakan satu siri beban dalam arah kanan ke kiri..

[10 marks]
[*10 markah*]

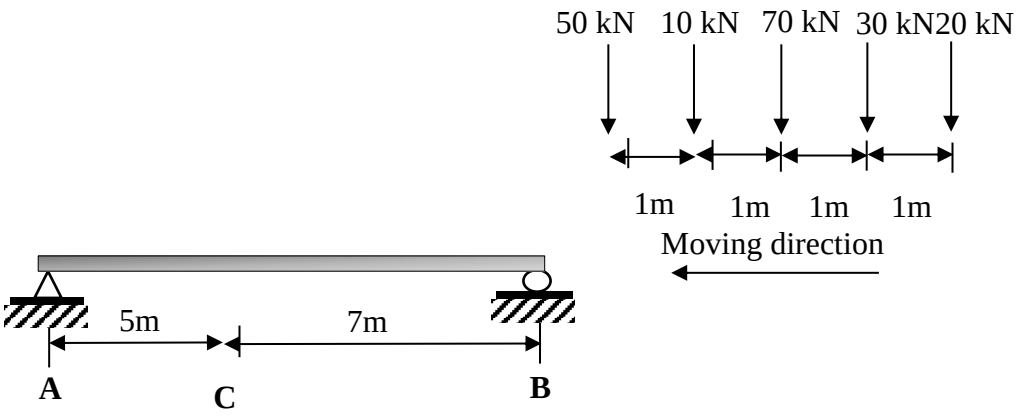


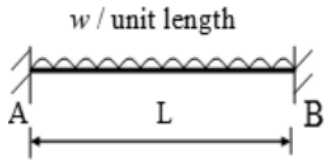
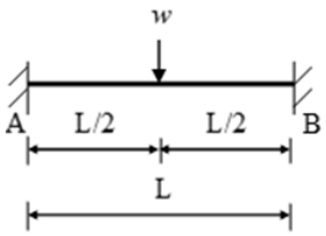
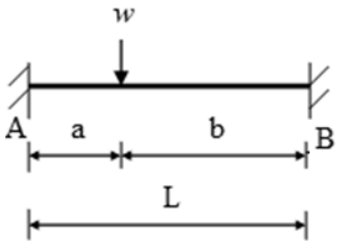
Figure 2a/*Rajah 2a*

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)

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