**Federal University, Oye-Ekiti, Nigeria.**

**Department of Civil Engineering**

1.5P

P

ω

0.5*x*

0.75*x*

B

A

*x*

*3x*

*2x*

**Figure 1: A Simply Supported Beam with overhangs at both ends.**

P

1.5P

ω

A

B

0.5*x*

0.75*x*

*3x*

*2x*

*x*

**Figure 2: A Simply Supported Beam with overhangs at both ends.**

Data

S/No. =

P = (KN)

ω = (KN/m)

 *x* = (m)

 Figure =

For the beam shown in **Figure 1** or **Figure 2** use the data given to you (from the data sheet) to answer the questions below.

1. Use this Question as the COVER to your answer sheet
2. Draw the Beam to Scale 1: 40 (using technical drawing sign if necessary) again with the Data given to **YOU**.
3. Determine the reactions at the supports A and B
4. Determine the shear forces and the bending moments in the beam
5. Draw the shear force and the bending moments diagrams
6. At what point is the maximum bending moment, and what is the value?
7. What is the relationship between the point of maximum bending and the shear force at that point
8. State the value of the maximum shear force

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**DATA 🡪 Department of Civil Engineering**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S/No | P (KN) | ω (KN/m) | *x (m)* | Figure  |
| 1 | 60 | 4 | 7 | 2 |
| 2 | 25 | 5 | 6 | 1 |
| 3 | 30 | 6 | 5 | 1 |
| 4 | 35 | 8 | 4 | 2 |
| 5 | 40 | 8 | 4 | 2 |
| 6 | 45 | 10 | 5 | 1 |
| 7 | 50 | 10 | 6 | 1 |
| 8 | 55 | 8 | 7 | 2 |
| 9 | 60 | 8 | 8 | 2 |
| 10 | 60 | 6 | 4 | 1 |
| 11 | 55 | 6 | 5 | 1 |
| 12 | 50 | 7 | 6 | 2 |
| 13 | 45 | 8 | 7 | 1 |
| 14 | 40 | 9 | 8 | 2 |
| 15 | 35 | 10 | 7 | 1 |
| 16 | 30 | 9 | 6 | 2 |
| 17 | 25 | 8 | 5 | 1 |
| 18 | 30 | 7 | 4 | 2 |
| 19 | 35 | 6 | 4 | 1 |
| 20 | 40 | 5 | 5 | 2 |
| 21 | 40 | 5 | 4 | 1 |
| 22 | 38 | 5 | 5 | 2 |
| 23 | 35 | 6 | 5 | 1 |
| 24 | 33 | 6 | 6 | 2 |
| 25 | 30 | 7 | 6 | 1 |
| 26 | 30 | 7 | 6 | 2 |
| 27 | 33 | 8 | 7 | 1 |
| 28 | 35 | 8 | 7 | 2 |
| 29 | 38 | 9 | 8 | 1 |
| 30 | 40 | 9 | 8 | 2 |
| 31 | 40 | 10 | 9 | 1 |
| 32 | 37 | 9 | 5 | 1 |
| 33 | 35 | 9 | 7 | 2 |
| 34 | 32 | 8 | 7 | 1 |
| 35 | 30 | 8 | 6 | 1 |
| 36 | 30 | 8 | 6 | 1 |
| 37 | 30 | 8 | 7 | 2 |
| 38 | 33 | 9 | 7 | 1 |
| 39 | 35 | 9 | 8 | 2 |
| 40 | 38 | 10 | 8 | 1 |
| 41 | 40 | 9 | 9 | 1 |
| 42 | 40 | 9 | 5 | 2 |
| 43 | 37 | 8 | 7 | 1 |
| 44 | 35 | 8 | 7 | 1 |
| 45 | 32 | 10 | 6 | 2 |
| 46 | 60 | 5 | 6 | 1 |
| 47 | 25 | 6 | 5 | 1 |
| 48 | 30 | 8 | 4 | 2 |
| 49 | 35 | 8 | 4 | 2 |
| 50 | 40 | 10 | 5 | 1 |
| 51 | 45 | 10 | 6 | 1 |
| 52 | 50 | 8 | 7 | 2 |
| 53 | 55 | 8 | 8 | 2 |
| 54 | 60 | 6 | 4 | 1 |
| 55 | 60 | 6 | 5 | 1 |
| 56 | 55 | 7 | 6 | 2 |
| 57 | 50 | 8 | 7 | 1 |
| 58 | 45 | 9 | 8 | 2 |
| 59 | 40 | 10 | 7 | 1 |
| 60 | 35 | 9 | 6 | 2 |
| 61 | 30 | 8 | 5 | 1 |
| 62 | 25 | 7 | 4 | 2 |
| 63 | 30 | 6 | 4 | 1 |
| 64 | 35 | 5 | 5 | 2 |
| 65 | 40 | 5 | 4 | 1 |
| 66 | 40 | 5 | 5 | 2 |
| 67 | 38 | 6 | 5 | 1 |
| 68 | 35 | 6 | 6 | 2 |
| 69 | 33 | 7 | 6 | 1 |
| 70 | 30 | 7 | 6 | 2 |
| 71 | 30 | 8 | 7 | 1 |
| 72 | 33 | 8 | 7 | 2 |
| 73 | 35 | 9 | 8 | 1 |
| 74 | 38 | 9 | 8 | 2 |
| 75 | 40 | 10 | 9 | 1 |
| 76 | 40 | 9 | 5 | 1 |
| 77 | 37 | 9 | 7 | 2 |
| 78 | 35 | 8 | 7 | 1 |
| 79 | 32 | 8 | 6 | 1 |
| 80 | 30 | 8 | 6 | 1 |
| 81 | 30 | 8 | 7 | 2 |
| 82 | 30 | 9 | 7 | 1 |
| 83 | 33 | 9 | 8 | 2 |
| 84 | 35 | 10 | 8 | 1 |
| 85 | 38 | 9 | 9 | 1 |
| 86 | 40 | 9 | 5 | 2 |
| 87 | 40 | 8 | 7 | 1 |
| 88 | 37 | 8 | 7 | 1 |
| 89 | 35 | 10 | 6 | 2 |
| 90 | 32 | 8 | 7 | 2 |
| 91 | 40 | 9 | 7 | 1 |
| 92 | 40 | 9 | 8 | 2 |
| 93 | 37 | 10 | 8 | 1 |
| 94 | 35 | 9 | 9 | 1 |
| 95 | 32 | 9 | 5 | 2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S/No | P (KN) | ω (KN/m) | *x (m)* | Figure  |
| 96 | 25 | 4 | 5 | 2 |
| 97 | 30 | 5 | 4 | 1 |
| 98 | 35 | 6 | 4 | 1 |
| 99 | 40 | 8 | 5 | 2 |
| 100 | 45 | 8 | 6 | 2 |
| 101 | 50 | 10 | 7 | 1 |
| 102 | 55 | 10 | 8 | 1 |
| 103 | 60 | 8 | 4 | 2 |
| 104 | 60 | 8 | 5 | 2 |
| 105 | 55 | 6 | 6 | 1 |
| 106 | 50 | 6 | 7 | 1 |
| 107 | 45 | 7 | 8 | 2 |
| 108 | 40 | 8 | 7 | 1 |
| 109 | 35 | 9 | 6 | 2 |
| 110 | 30 | 10 | 5 | 1 |
| 111 | 25 | 9 | 4 | 2 |
| 112 | 30 | 8 | 4 | 1 |
| 113 | 35 | 7 | 5 | 2 |
| 114 | 40 | 6 | 4 | 1 |
| 115 | 40 | 5 | 5 | 2 |
| 116 | 38 | 5 | 5 | 1 |
| 117 | 35 | 5 | 6 | 2 |
| 118 | 33 | 6 | 6 | 1 |
| 119 | 30 | 6 | 6 | 2 |
| 120 | 30 | 7 | 7 | 1 |
| 121 | 33 | 7 | 7 | 2 |
| 122 | 35 | 8 | 8 | 1 |
| 123 | 38 | 8 | 8 | 2 |
| 124 | 40 | 9 | 9 | 1 |
| 125 | 40 | 9 | 5 | 2 |
| 126 | 37 | 10 | 7 | 1 |
| 127 | 35 | 9 | 7 | 1 |
| 128 | 32 | 9 | 6 | 2 |
| 129 | 30 | 8 | 6 | 1 |
| 130 | 30 | 8 | 7 | 1 |
| 131 | 30 | 8 | 7 | 1 |
| 132 | 33 | 8 | 8 | 2 |
| 133 | 35 | 9 | 8 | 1 |
| 134 | 38 | 9 | 9 | 2 |
| 135 | 40 | 10 | 5 | 1 |
| 136 | 40 | 9 | 7 | 1 |
| 137 | 37 | 9 | 7 | 2 |
| 138 | 35 | 8 | 6 | 1 |
| 139 | 32 | 8 | 6 | 1 |
| 140 | 60 | 10 | 5 | 2 |
| 141 | 25 | 5 | 4 | 1 |
| 142 | 30 | 6 | 4 | 1 |