

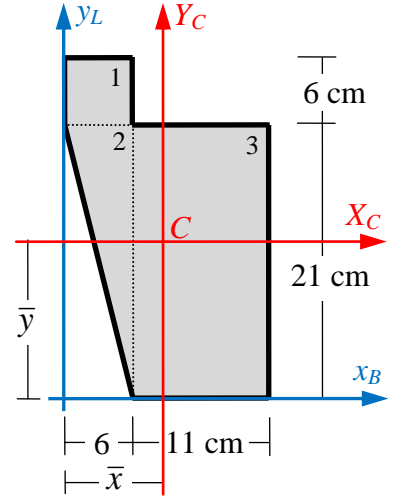
الاسم:

الإسم:

Quiz: (10 Marks)

Choose the nearest answer.

- The shown cross-section is
(A) Symmetrical about X_C -axis. (B) Symmetrical about horizontal axis. (C) Symmetrical about vertical axis. (D) Symmetrical about vertical axis. (E) Not symmetrical.
- The areas 1, 2 and 3 are:
(A) 36 cm^2
 126 cm^2
 231 cm^2 (B) 30 cm^2
 63 cm^2
 231 cm^2 (C) 36 cm^2
 60 cm^2
 231 cm^2 (D) 36 cm^2
 60 cm^2
 321 cm^2 (E) 36 cm^2
 63 cm^2
 231 cm^2
- The total area of the section is:
(A) 393 cm^2 (B) 324 cm^2 (C) 327 cm^2 (D) 427 cm^2 (E) 330 cm^2
- The first moments of areas 1, 2 and 3 about the y_L -axis are:
(A) 108 cm^3
 252 cm^3
 2656.5 cm^3 (B) 972 cm^3
 5211 cm^3
 6543 cm^3 (C) 36 cm^3
 72 cm^3
 288 cm^3 (D) 864 cm^3
 882 cm^3
 3456 cm^3 (E) 108 cm^3
 288 cm^3
 3456 cm^3
- The centroid of the cross-section is at $\bar{x} = \dots\dots$ from y_L -axis.
(A) 9.14 cm (B) 12.64 cm (C) 10.1 cm (D) -10.1 cm (E) 9.73 cm
- The first moments of areas 1, 2 and 3 about the x_B -axis are:
(A) 864 cm^3
 882 cm^3
 2425.5 cm^3 (B) 972 cm^3
 5211 cm^3
 6543 cm^3 (C) 36 cm^3
 72 cm^3
 288 cm^3 (D) 972 cm^3
 1152 cm^3
 3456 cm^3 (E) 108 cm^3
 288 cm^3
 3456 cm^3
- The centroid of the cross-section is at $\bar{y} = \dots\dots$ from x_B -axis.
(A) 12.64 cm (B) 9.727 cm (C) 14.09 cm (D) 11.11 cm (E) 14.09 cm
- The second moments of areas 1, 2 and 3 about their centroidal x_c -axes are:
(A) 108 cm^4
 1543.5 cm^4
 8489.25 cm^4 (B) 108 cm^4
 4032 cm^4
 42831 cm^4 (C) 36 cm^4
 72 cm^4
 288 cm^4 (D) 108 cm^4
 144 cm^4
 3456 cm^4 (E) 108 cm^4
 2304 cm^4
 13824 cm^4
- The second moments of areas 1, 2 and 3 about the X_C -axis are:
(A) 324 cm^4
 1152 cm^4
 41472 cm^4 (B) 4753 cm^4
 1660 cm^4
 9548 cm^4 (C) 26244 cm^4
 18432 cm^4
 41472 cm^4 (D) 44262 cm^4
 23481 cm^4
 27414 cm^4 (E) 108 cm^4
 2304 cm^4
 13824 cm^4
- The second moment of the cross-section about its centroidal X_C -axis is:
(A) 16236 cm^4 (B) 15961 cm^4 (C) 86148 cm^4 (D) 102384 cm^4 (E) 46656 cm^4
- The second moments of areas 1, 2 and 3 about their centroidal y_c -axes are:
(A) 108 cm^4
 441 cm^4
 6543 cm^4 (B) 36 cm^4
 72 cm^4
 288 cm^4 (C) 108 cm^4
 126 cm^4
 2329.25 cm^4 (D) 108 cm^4
 2304 cm^4
 13824 cm^4 (E) 108 cm^4
 144 cm^4
 3456 cm^4
- The second moments of areas 1, 2 and 3 about the Y_C -axis are:
(A) 26244 cm^4
 18432 cm^4
 41472 cm^4 (B) 423 cm^4
 2511 cm^4
 27414 cm^4 (C) 1466 cm^4
 1791 cm^4
 3615 cm^4 (D) 423 cm^4
 2511 cm^4
 27414 cm^4 (E) 324 cm^4
 1152 cm^4
 41472 cm^4
- The second moment of the cross-section about its centroidal Y_C -axis is:
(A) 42948 cm^4 (B) 46656 cm^4 (C) 6871 cm^4 (D) 9186.55 cm^4 (E) 23756.73 cm^4
- The product (mixed) moments of areas 1, 2 and 3 about their centroidal x_c and y_c -axes are:
(A) 0
0
0 (B) 36 cm^4
 -288 cm^4
 288 cm^4 (C) 0
 -221 cm^4
0 (D) 36 cm^4
 -288 cm^4
 288 cm^4 (E) 0
 72 cm^4
0
- The product (mixed) moments of areas 1, 2 and 3 about the X_C and Y_C -axes are:
(A) 3126.35 cm^4
 787.99 cm^4
 1368.60 cm^4 (B) 0
 -288 cm^4
0 (C) -2511.2 cm^4
 -661 cm^4
 -1166.7 cm^4 (D) -3126.35 cm^4
 -787.99 cm^4
 -1368.60 cm^4 (E) 36 cm^4
 -288 cm^4
 288 cm^4



Please turn over

16. The product (mixed) moment of the cross-section about its centroidal X_C and Y_C -axis is:
 (A) -7055.81 cm^4 (B) 5570.18 cm^4 (C) -4339 cm^4 (D) 5570.18 cm^3 (E) -557.80 cm^4
17. The direction of the principal axes is:
 (A) 54.5° (B) 36.1° (C) 45.0° (D) 21.84° (E) 18.7 cm
18. The principal moments of inertia are:
 (A) 7301.06 cm^4 (B) 2564.21 cm^4 (C) 25642.21 cm^3 (D) 18407 cm^4 (E) -25642.21 cm^4
 310.76 cm^4 730.06 cm^4 7301.06 cm^3 5133 cm^4 -7301.06 cm^4
19. The polar moment of inertia is:
 (A) 7611.82 cm^4 (B) 3294.28 cm^4 (C) 32943.28 cm^3 (D) 22832 cm^4 (E) -32943.28 cm^4
20. The radiuses of gyration for the cross-section about their centroidal X_C & Y_C -axes are:
 (A) 4.57 cm^2 (B) 7.12 cm^4 (C) 60 cm (D) 6.95 cm (E) -4.57 cm
 7.12 cm^2 7.12 cm 60 cm 4.56 cm -7.12 cm

Answer:

- | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. | (A) | (B) | (C) | (D) | (E) | 11. | (A) | (B) | (C) | (D) | (E) |
| 2. | (A) | (B) | (C) | (D) | (E) | 12. | (A) | (B) | (C) | (D) | (E) |
| 3. | (A) | (B) | (C) | (D) | (E) | 13. | (A) | (B) | (C) | (D) | (E) |
| 4. | (A) | (B) | (C) | (D) | (E) | 14. | (A) | (B) | (C) | (D) | (E) |
| 5. | (A) | (B) | (C) | (D) | (E) | 15. | (A) | (B) | (C) | (D) | (E) |
| 6. | (A) | (B) | (C) | (D) | (E) | 16. | (A) | (B) | (C) | (D) | (E) |
| 7. | (A) | (B) | (C) | (D) | (E) | 17. | (A) | (B) | (C) | (D) | (E) |
| 8. | (A) | (B) | (C) | (D) | (E) | 18. | (A) | (B) | (C) | (D) | (E) |
| 9. | (A) | (B) | (C) | (D) | (E) | 19. | (A) | (B) | (C) | (D) | (E) |
| 10. | (A) | (B) | (C) | (D) | (E) | 20. | (A) | (B) | (C) | (D) | (E) |

With best wishes

Dr. M. Abdel-Kader