

Federal University of Technology, Owerri
 Department Of Mechanical Engineering
 Course: Eng. 213: Engineering Mechanics 1 (Statics) Harmattan Semester Examination
 Session: 2013/2014 Time: 2hours

Name	
Reg No	
Dept	

Instruction: Answer All Questions and Write The Correct Answers in The Spaces Provided.

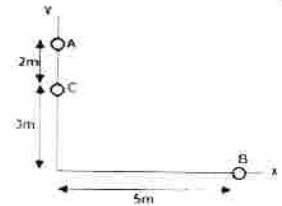
A force $F = 700i + 1500j$ N is applied to a hook.

1. The magnitude of the force
2. The angle θ it forms with the x-axis is.....

F is a 400kN force directed from $A(2, 1, -4)$ m to $B(4, 4, 1)$ m.

3. The moment of F about the origin is.....
4. The magnitude of this moment is.....
5. The moment of F about point $C(3, 4, 2)$ m is.....
6. The moment arm d from C is.....

A force F passing through C causes a clockwise moment of 120N-m about point A and a clockwise moment of 70N-m about B .

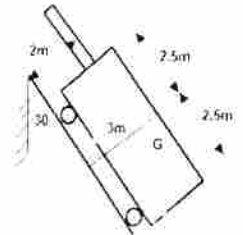


7. The magnitude of the force is
8. Its intercept is.....

A force-couple system has $F_1 = 5i + 15j - 3k$ N acting at $(3, 4, 2)$ m, F_2 acting at $(0, 0, 1)$ m and a couple C_1 . Another system has $F = 6i + 4j + 3k$ N acting at $(0, 0, 0)$ m and $C = 3i + 6j + 3k$ N-m. If the two systems are equivalent then.

9. The value of the unknown force F_2 is.....
10. The value of couple C_1 is.....

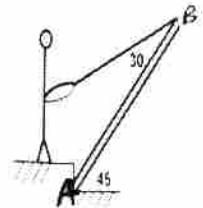
A truck weighing 500kN is at rest on an inclined surface as shown held by a cable. The centre of gravity G is 3m from track and the surface is smooth.



11. The tension in the cable is.....
12. The reaction on the wheels is.....

A man raises a 10kg flag pole of length 3m by pulling a rope.

13. The tension in the rope is.....
14. What is the value of the reaction R_x at A is.....
15. The reaction at A if the system is in equilibrium is
16. The direction of the resultant force at A is.....



The truss shown has a supports at G and B respectively,

17. The reaction R_x at G is.....
18. The reaction R_y at G is.....
19. The resultant force at G is.....
20. The reaction at B is.....

