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XI/SCIENCE/2017-18
OLYMPIAD PRACTICE WORKSHEET

<u>Tick the correct option</u>

1. Which of the following is a physical quantity that has a magnitude but no direction?
A. Vector   B. Frame of reference   C. Resultant   D. Scalar

2. Multiplying or dividing vectors by scalars results in
   A. Vectors if multiplied or scalars if divided   B. Scalars if multiplied scalars
   C. Scalars   D. Vectors

3. Identify the following quantities as scalar or vector: the mass of an object, the number of leaves on a tree, wind velocity.

A. Vector, scalar, scalar   B. Vector, scalar, vector
C. Scalar, scalar, vector   D. Scalar, vector, vector

4. Which of the following is an example of a vector quantity?
A. Temperature   B. Velocity
C. Volume   D. Mass

5. Direction of resultant of two vectors is given by

   A. arccos(Ay + By/Ax + Bx)

   B. arccos(Ax + By/Ay + Bx)

   C. arctan(Ay + By/Ax + Bx)

   D. arctan(Ay-By/Ax-Bx)

6   Product of velocity and mass is called
    A. Momentum   B. Work   C. Acceleration   D.   Speed

7. If value of moment arm is zero, then torque produced will be
    A. 1   B. 0   C. doubled   D. decreased

8. A vector having magnitude only is called
    A. Scalar   B. resultant   C. unit vector   D. temperature

9. Point of intersection of two coordinate axes is called
    A. Mid   B. origin   C. circumference   D. radius

10. One mole of an ideal monatomic gas expands till its temperature doubles under the process V^2T = constant. If the initial temperature is 400 K, the work done by the gas is

(A) 400 R (B) 200 R (C) − 200 R (D) Indeterminate

11. In the reaction, $4NH_3(g) + 5O_2(g)$ $4NO(g) + 6H_2O(l)$
when 1 mole of ammonia and 1 mole of O_2 are made to react to completion :

(A) 1.0 mole of H_2O is produced   (B) 2.0 mole of NO will be produced
(C) All the oxygen will be consumed   (D) All the ammonia will be consumed.

12. From a container of wine, a thief has stolen 15 litres of wine and replaced it with same quantity of water. He again repeated the same process. Thus in three attempts the ratio of wine and water became 343 : 169. The initial amount of wine in the container was

(A) 75 litres   (B) 100 litres   (C) 136 litres   (D) 120 litres

13. After how many laps will they have raised the same amount of money?
(A) 3   (B) 6.5   (C) 14.5   (D) 20

13. A guitar manufacturer uses a computer•controlled machine to make electric guitars. The table shows the total number of guitars made after 2, 4, 8 and 16 hours. If g represents the total number of guitars made after h hours, which equation represents the pattern shown in the table?

(A) $g = 12h - 6$ (B) $g = 12h$

(C) $g = 3h^2 - 6$ (D) $g = 3h^2 + 6$

15. What is the nth term in the arithmetic series below?

$$3 + 7 + 11 + 15 + 19 \ldots.$$

(A) $4n$ (B) $3 + 4n$ (C) $2n + 1$ (D) $4n - 1$

16. Julie works at the amusement park with the maintenance crew. She needs to replace a string of burned•out lights along the arc shown between seat 1 and seat 6. The arc makes up 1/4 of the Giant Wheel. The 20 seats of the wheel are equally spaced, and the supports from the centre of the wheel to each seat are 15 feet in length. How long, to the nearest foot, does the string of replacement lights need to be?

(A) 24 feet   (B) 30 feet   (C) 47 feet   (D) 90 feet

17. The sum of three consecutive odd integers is 21. If x is the least of these odd integers, which equation must be true?

(A) $3x = 21$ (B) $3x + 3 = 21$ (C) $3x + 4$ (D) None of these

18. When an article is sold for ` 703, loss incurred is 25% less than the profit earned on selling it at ` 836. What is the selling pri ce of the article when it earns a profit of 20%

(A.) ` 912          (B) ` 1576   (C) ` 1532          (D) ` 1092

19. What are the coordinates of the image of point $P(-3, -7)$ after a reflection about the line $y = 2$?

(A) $(-3, 9)$ (B) $(-3, 11)$ (C) $(5, -7)$ (D) $(7, -7)$

20. Five persons entered the lift cabin on the ground floor of an 8•floor house. Suppose each of them independently and with equal probability can leave the cabin at any floor begin ning with the first. Find out the probability that all persons leave at different floors.

(A) 365 /2401   (B) 360 /2401   (C) 35 /2410   (D) None of these