2022-01-24

1.A hollow metal sphere of radius R is uniformly charged. The electric field due to the sphere at a distance r from the centre

Increases as r increases for r < R and for r > R

Zero as r increases for r < R, decreases as r increases for r > R

Zero as r increases for r < R, increases as r increases for r > R

Decreases as r increases for r < R and for r > R

2.Four wires of equal length and of resistances 10 ohms each are connected in the form of a square. The equivalent resistance between two opposite corners of the square is

10 ohm

20 ohm

40 ohm

2.5 ohm

3.Six identical bulbs are connected as shown in the figure with a DC source of emf E and zero internal resistance. The ratio of power consumption by the bulbs when (i) all are glowing and (ii) in the situation when two from section A and one from section B are glowing, will be

4:9

9:4

1:2

2:1

4.A particle of mass m moving with velocity Vo strikes a simple pendulum of same mass and sticks to it. The maximum height attained by the pendulum will be

$\frac{V_0^2}{8g}$

$\sqrt{V_0 g}$

$2\sqrt{\frac{V_0}{g}}$

$\frac{V_0^2}{4g}$

5.A lamp consumes only 50% of peak power in an a.c. circuit. What is the phase difference between the applied voltage and the circuit current?

$\frac{\pi}{6}$

$\frac{\pi}{3}$

$\frac{\pi}{4}$

$\frac{\pi}{2}$

6.If the momentum of a body increases by 0.01%, its kinetic energy will increase by

0.01%

0.02%

0.04%

0.08%

7.If $n(A) = 4$, $n(B) = 3$, $n(A \times B \times C) = 24$, then $n(C) =$

288

1

12

2

8.Unit vector in the direction of $2i - 2j + k$ is:

$\frac{2}{3}i - \frac{2}{3}j + \frac{1}{3}k$

$-\frac{2}{3}i + \frac{2}{3}j - \frac{1}{3}k$

both (a) and (b)

none of the above

9.The relation $A \cap B = A \cup B$ is true if

$A \subset B$

$B \subset A$

$A \subset B$ and $B \subset A$

none of the above

10.

$$\lim_{x \to 2} \frac{|x-2|}{x-2} =$$

1

-1

doesn't exist

none of these

11.The figures 4, 5, 6, 7, 8 are written in every possible order. The number of numbers greater than 56000 is

72

96

90

98

12.The product of any r consecutive natural numbers is always divisible by

r !

r^2

r^n

None of these

13.The function $f(x) = \log\left(x + \sqrt{x^2+1}\right)$, is

neither an even nor an odd function

an even function

an odd function

a periodic function

14.The area bounded by a parallelogram whose adjacent sides are given by $(2, 4, 6)$ and a perpendicular vector of same magnitude is:

$\sqrt{56}$

56

12

144

15.Oxidation number of osmium (Os) in OsO_4 is

- 4
- 6
- 7
- 8

16.Select the compound from the following which dissolves in water

CCl_4

CS_2

$CHCl_3$

C_2H_5OH

17.Conc.HNO_3 reacts with I_2 to give

HI

HOI

$HOIO_2$

$HOIO_3$

18.IUPAC name of $(CH_3)_2 - CH - CH = CH - CH_3$ is

2-methyl-3-pentene

4-methyl-2-pentene

1, 2-isopropyl-1-propene

3-isopropyl-2-propene

19.As cool as cucumber means

an interesting person

a tall person

a calm person, especially when something is surprising

None

20.Although he hardly attends the classes, he gets good grades.

noun

verb

preposition

conjunction