ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

WORK SHEET 31

Subject : PHYSICS 18.07.20

CLASS : XII

Chapter : Alternating current

Topic : Basic idea of ac current and ac voltage, phase value, frequency etc, I_{avg}, I_{rms}, V_{avg}, V_{rms}, P_{avg}, $P_{avg} = V_{rms}.I_{rms}.\cos\theta$ power factor.

Multiple Choice Question : **1 x 15 = 15**

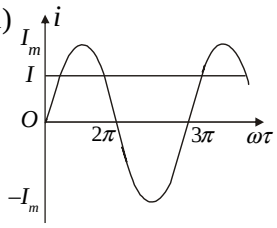
1. Which current do not change direction with time?
   (a) DC current (b) AC current (c) Both (a) and (b) (d) Neither (a) nor (b)

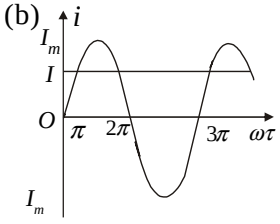
2. The electric mains supply in our homes and offices is a voltage that varies like a sine function with time. Such a voltage is called .... and the current driven by it in a circuit is called the ....
   (a) DC voltage, AC current (b) AC voltage, DC current
   (c) AC voltage, DC voltage (d) AC voltage, AC current

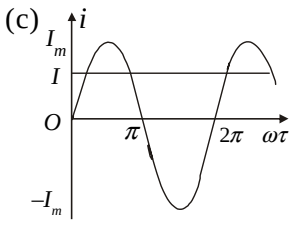
3. When the current changes continuously in magnitude and periodically in direction, several times per second, the current is known as the
   (a) direct current (b) induced current
   (c) displacement current (d) alternating current

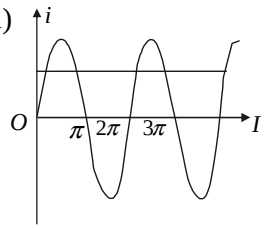
4. The sum of instantaneous current values over one complete cycle is
   (a) negative (b) positive (c) zero (d) both (a) and (b)

5. To express AC power in the same form as DC power, a special value of current is defined and used, is called
   (a) root mean spuare current (I_{mm}) (b) effective current
   (c) induced current (d) both (a) and (b)

6. Which of the following graphs, shows *i/r* ?
   (a) 

   (b) 

   (c) 

   (d) 

7. The household line voltage of 220 V is a rms value with a peak voltage of
   (a) 310V (b) 311V (c) 307V (d) 302V

8. Alternating current cannot be measured by DC ammeter, because
   (a) AC cannot pass through DC ammeter
   (b) average value of current in complete cycle is zero
   (c) AC is virtual
   (d) AC changes its direction

9. A generator produces a voltage that is given by V = 240 sin 120 t, where t is in seconds. the frequency and rms voltage are

(a) 60 Hz and 240 V (b) 19 Hz and 120 V

(c) 19 Hz and 170 V (d) 754 Hz and 70 V

10. An alternating current is given by the equation $i = i_1 \cos \omega t + i_2 \sin \omega t$. The rms current is given by

(a) $\frac{1}{\sqrt{2}}(i_1 + i_2)$ (b) $\frac{1}{\sqrt{2}}(i_1 + i_2)^2$ (c) $\frac{1}{\sqrt{2}}(i_1^2 + i_2^2)^{1/2}$ (d) $\frac{1}{2}(i_1^2 + i_2^2)^{1/2}$

11. If an AC main supply is given to be 220V. What would be the average emf during a positive half-cycle

(a) 198 V (b) 386 V (c) 256 V (d) None of these

12. If an alternating voltage is represented as E = 141 sin (628 t), then the rms value of the voltage and the frequency are respectively

(a) 141 V, 628 Hz (b) 100 V, 50 Hz (c) 100 V, 100 Hz (d) 141 V, 100 Hz

13. An ac having a peak value 1.41 A is used to heat a wire. A dc producing the same heating rate will be of

(a) 1.41 A (b) 2.0 A (c) 0.705 A (d) 1.0 A

14. The relation between angular velocy (ω) and driving frequency (f) of an alternating current is

(a) $\omega = 2\pi f$ (b) $\omega = \frac{2\pi}{f}$ (c) $f = \frac{2\pi}{\omega}$ (d) $f = 2\pi\omega$

15. Form factor of an alternating voltage is the ratio of

(a) peak value and rms value (b) peak value and average value

(c) rms value and average value (d) rms value and peak value

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