

ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION



18.07.20

SOLUTION TO WORK SHEET 31

Subject : PHYSICS

CLA	SS : XII	Topic : Basic idea of ac current and ac voltage, phase value, frequency etc, I., I., V., V., P.,
Chapter : Alternating current		$P_{avg} = V_{rms} I_{rms} \cos \theta \text{ power factor.}$
Mult	iple Choice Question :	1 x 15 = 15
1.	Which current do not change direction with	1 time?
	(a) DC current (b) AC current Ans. (a) DC current	(c) Both (a) and (b) (d) Neither (a) nor (b)
2.	The electric mains supply in our homes and with time. Such a voltage is called and	offices is a voltage that varies like a sine function 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 Ans (d) AC voltage AC current	(d) AC voltage, AC current
3. When the current changes continuously in magnitude and periodically in direction, se per second, the current is known as the		agnitude and periodically in direction, several times
	(a) direct current	(b) induced current
	(c) displacement current	(d) alternating current
	Ans. (d) alternating current	
4.	The sum of instantaneous current values over one complete cycle is	
	(a) negative (b) positive Ans. (c) zero	(c) zero (d) both (a) and (b)
5.	To express AC power in the same form as used, is called	DC power, a special value of current is defined and
	(a) root mean spuare current (I_{mm})	(b) effective current
	(c) induced current	(d) both (a) and (b)
	Ans. (d) both (a) and (b)	
6.	Which of the following graphs, shows i/r	?
	(a) I_m I_m I O $-I_m$ (b) I_m I I I I I T I T I I I I I I I I	(c) I_m I I I I I I I I
	Ans. (c) $I_m \stackrel{i}{\swarrow}$	

0

 $-I_{m}$

π

 $2\pi \omega \tau$

- 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
 (d) 311V
- 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
 - Ans. (b) average value of current in complete cycle is zero
- 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
 - Ans. (c) 19 Hz and 170 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) $\frac{1}{2}(i_1^2 + i_2^2)^{1/2}$ Ans. (c) $\frac{1}{\sqrt{2}}(i_1^2 + i_2^2)^{1/2}$
- 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 Ans. (a) 198 V
- 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
 Ans. (c) 100 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) $f = 2\pi\omega$
Ans. (a) $\omega = 2\pi f$

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

Ans. (c) rms value and average value

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