Physicsaholics

DPP – 1 (Alternating Current)

Video Solution on Website :- https://physicsaholics.com/home/courseDetails/102

Video Solution on YouTube:- https://youtu.be/YYp0KX2mAVc

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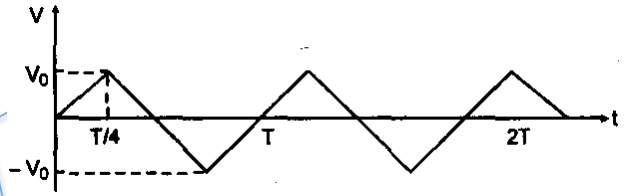
Q 1. The electric current in a circuit is given by i = 3t Here, t is in second and i in ampere. Then rms current for the period t = 0 to t = 1 s is:

(a) 3 A (b) 9 A (c) $\sqrt{3}$ A (d) $\sqrt[3]{3}$

Q 2. Average value of voltage from t = 0 to t = $\frac{2\pi}{\omega}$ for function: $V = V_0 \sin \omega t$ for $0 \le t \le \frac{\pi}{\omega}$ and $V = -V_0 \sin \omega t$ for $\frac{\pi}{\omega} \le t \le \frac{2\pi}{\omega}$ is :

(a) $\frac{V_0}{\sqrt{2}}$ (b) $\left(\frac{2}{\pi}\right) V_0$ (c) $\frac{V_0}{2}$ (d) zero

Q 3. The voltage time (V —t) graph for a triangular wave having peak value V_0 is as shown in figure. The rms value of V is:



(a) $\frac{V_0}{3}$ (b) $\frac{V_0}{2}$

(c) $\frac{V_0}{\sqrt{2}}$ (d) $\frac{V_0}{\sqrt{3}}$

Q 4. The current through a wire changes with time according to the equation I = $\sqrt{t}$. The correct value of the rms current within the time interval t = 2 to t = 4s will be -

(a) $\sqrt{3}$A (b) 3 A

(c) 3 A (d) None of these

Q 5. In a circuit an A.C. current and a D. C. current are supplied together. The expression of the instantaneous current is given as i = 3 + 6 sin wt Then the rms value of the current is –

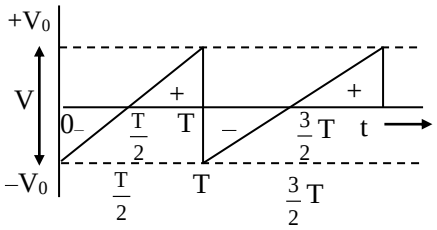
(a) 3 (b) 6 (c) $3\sqrt{2}$ (d) $3\sqrt{3}$

Q 6. The time required for a 50Hz alternating current to increase from zero to 70.7% of its peak value is -

(a) 2.5 ms (b) 10 ms

(c) 20 ms (d) 14.14 ms

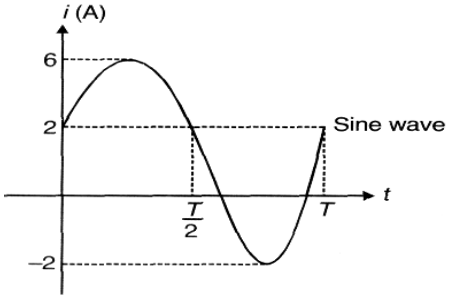
Q 7. Find rms value for the saw-tooth voltage of peak value V_0 as shown in figure.



(a) V_0 (b) $\frac{V_0}{2}$

(c) $\frac{V_0}{3}$ (d) none of these

Q 8. The current 'i' through a wire varies with time t as shown in the figure. The effective (rms) value of the current is



(a) 6A (b) $2\sqrt{3}$

(c) $2 + 2\sqrt{2}$ A (d) 3 A

Q 9. Instantaneous current in an ac circuit is given I = i_0 Sin ωt. Average value of current from t= 0 to t= $\frac{3\pi}{\omega}$ is

(a) Zero (b) i_0 (c) $\frac{i_0}{2}$ (d) $\frac{2i_0}{3\pi}$

Answer Key

Q.1 c	**Q.2 b**	**Q.3 d**	**Q.4 a**	**Q.5 d**
Q.6 a	**Q.7 d**	**Q.8 b**	**Q.9 d**	