PHYSICS

AAKASH INSTITUTE ENGLISH

Mock Test 33: PHYSICS

Example

1. A light bulb is rated at 100 W for a 220 V ac supply . The resistance of the bulb is

A. 242Ω

B. 484Ω

C. 384Ω

D. 100Ω

Answer: B

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2. A $100W, 200V$ bulb is operated on a $110V$ line. The power consumed is

A. 50 W

B. 75 W

C. 25W

D. 20 W

Answer: C

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3. A student wants to project the image of a candle flame on a screen 60cm in front of a mirror by keeping the flame at a distance of 15

cm from its pole.

(i) Write the type of mirror he should use.

(ii) Find the liner magnification of the image produced.

(iii) What is the distance between the object and its image ?

(iv) Draw a ray diagram to show the image formation in this case.

A. Straight line

B. Parabola

C. Rectangular hyperbola

D. Circle

Answer: C

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4. What is the reactance of a capacitor connected to a constant DC source?

A. Zero

B. Infinite

C. Between 0 to 1 ohm

D. Negetive

Answer: B

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5. An alternative current is given by $I = \left(100\sqrt{2}\sin t\right)A$. The RMS value of current is

A. $\frac{100}{\sqrt{2}}A$

B. $\frac{50}{\sqrt{2}}A$

C. 100 A

D. 50 A

Answer: C

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6. The average value of voltage for one cycle for the function

$$V = V_0 \sin \omega t \text{for} o \leq t \leq \frac{\pi}{\omega}$$

$$= -V_0 \sin \omega t \text{for} \frac{\pi}{\omega} \leq t \leq \frac{2\pi}{\omega} \text{ is}$$

A. $\frac{V_0}{\sqrt{2}}$

B. $2\frac{V_0}{\pi}$

C. $\frac{V_0}{\pi}$

D. $\sqrt{2}\frac{V_0}{\pi}$

Answer: B

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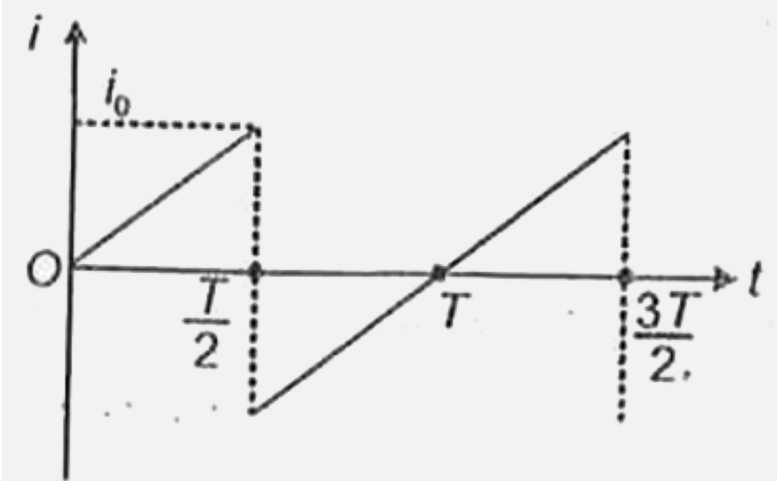
7. The mean value of current for half cycle for a current variation shown by the graph is



A. $\frac{I_0}{\sqrt{2}}$

B. $\frac{I_0}{2}$

C. I_0

D. $\frac{I_0}{4}$

Answer: C

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8. An alternating current is given by

$I = i_1 \cos \omega t + i_2 \sin \omega t.$

The rms current is given by

A. $\sqrt{\frac{I_0}{2}}$

B. $\frac{I_0}{\sqrt{2}}$

C. $\frac{I_0}{2}$

D. I_0

Answer: D

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9. The average value of an alternating voltage $V = V_0 \sin \omega t$ over a full cycle is

A. 

B. 

C. 

D. 

Answer: A

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10. There is no resistance in the capacitive circuit shown. Then charge on the capacitor at an time t 

A. $CV_0 \cos \omega t$

B. $CV_0 \sin \omega t$

C. $CV_0 \cos \omega \frac{t}{\sqrt{2}}$

D. $CV_0 \sin \omega \frac{t}{\sqrt{2}}$

Answer: B

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11. Which of the following is true for an ideal capacitor connected to a sinusoidal voltage source ?

A. neither the avarage power nor the avarage nor the avarage current is zero

B. avarage voltage is zero but the avarage power is non zero

C. both avarage power and avarage current is zero

D. Avarage power is zero but the avarage current is non zero

Answer: C

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12. A direct current of 5 amp is superimposed on an alternating current $I = 10\sin\omega t$ flowing through a wire. The effective value of the resulting current will be:

A. 

B. 

C. 

D. 

Answer: D

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13. For an ideal inductor, connected across a sinusoidal ac voltage source, state which one of the following quantity is zero:

(i) Instantaneous power is zero :

(ii) Average power over full cycle of the ac voltage source.

A. Zero

B. infinity

C. 1W

D. Between 0 to 1 W

Answer: A

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14. A resistor and a capacitor are connected in series with an AC source. If the potential drop across the capacitor is 5 V and that across resistor is 12 V, then applied voltage is

A. 25V

B. 40 V

C. 5 V

D. 12 V

Answer: A

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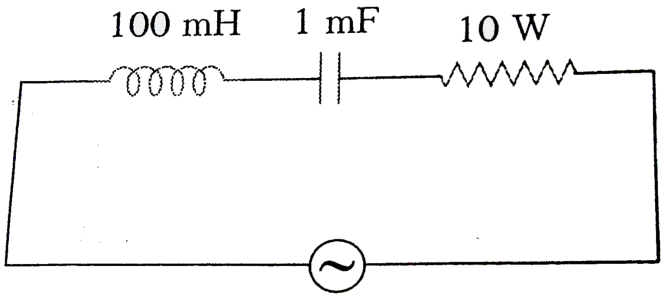
15. The following series L-C-R circuit , when driven by an emf source of angular frequency 70 kilo-radians per second , the circuit effectively behaves like



A. Purely resistive circuit

B. Series R-L circuit

C. Series R-c circuit

D. Series L-C circuit with R=O

Answer: A

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16. In an electrical circuit R,L, C and a.c voltage source are all connected in series. When L is removed from the circuit , the phase difference between the voltage and current in the circuit is $\pi/6$. If instead ,C is removed from

the circuit , the phase difference is again $\pi/6$.

The power factor of the circuit is

A. $\frac{1}{2}$

B. $\frac{1}{\sqrt{2}}$

C. 1

D. $\frac{\sqrt{3}}{2}$

Answer: C

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17. If a 16Ωresistance and 12Ω inductive reactance are present in an a.c series circuit. Then the impedance of the circuit will be

A. 28Ω

B. 5Ω

C. 20Ω

D. $14\sqrt{2}\Omega$

Answer: C

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18. The diagram shows a capacitor C and a resistor R connected in series to an ac source. V_1 and V_2 are voltmeters and A is an ammeter. Consider the following statement I. Reading n A and V_2 are always in phase II. Reading in V_1 is ahead in phase with reading in V_2 III. reading in A and V_1 are always in phase. which of these statments is/are correct

A. I only

B. II only

C. I nad II only

D. I and III only

Answer: A

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19. Define quality factor in electrical resonance circuit. Find quality factor of series resonance circuit.

A. $\omega \frac{L}{R}$

B. $\frac{1}{\omega} CR$

C. $\frac{1}{R}\sqrt{\frac{L}{C}}$

D. $\frac{R}{L}C$

Answer: C

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20. If resistance R =100 Omega, inductance L = 12mH and capacitance C=15muF are connected in series to an AC sources, then at resonance the impedance of circuit is

A. zero

B. 100Omega

C. 1000Omega

D. 10kOmega

Answer: B

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21. A 12 Ω resistor and a 0.21 H inductor are connected in series to an a.c. source operating

at V, 50 cycle second. The phase angle between current and source vottage is

A. 30degree

B. $\tan^{-1}(5.5)$

C. $\tan^{-2}(2)$

D. 60degree

Answer: B

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22. In a circuit L,C and R are connected in series with an altematng voltage source of frequency f. The current leads the voltage by 60degree. The value of $(X_c - X_L)$ is

A. $\sqrt{3}R$

B. $\sqrt{2}R$

C. $\frac{1}{\sqrt{3}}R$

D. 2R

Answer: A

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23. A capacitor of capacitance Chas initial charge Q_0 and connected to an inductor L as shown. At$t = 0$ switch S is closed. The current through the inductor when energy in the capacitor is three times the energy of inductor is 

A. 

B. 

C. 

D. 

Answer: A

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24. In an AC circuit, the instantaneous values of e.m.f and current are $e = 200 \sin 314t$ volt and $i = \sin\left(314t + \frac{\pi}{3}\right)$ ampere. The average power consumed in watt is

A. 20 kW

B. 2kW

C. zero

D. 25kW

Answer: C

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25. In series LCR circuit, the phase difference between voltage across L and voltage across C is

A. zero

B. π

C. $\frac{\pi}{2}$

D. 2π

Answer: B

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26. In an ideal transformer the number turns of primary and secondary coil is given as 100 and 200 respectively. If the peak value of the

primary voltage is 50V, then the r.m.s value of secondary voltage is nearest to

A. 100V

B. 200V

C. 60V

D. 70V

Answer: D

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27. Quantity that remains unchanged in a transformer is

A. Voltage

B. current

C. Frequency

D. Phase

Answer: C

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28. The primary and secondary coils of a transforme have 50 and 1500 turns respectively. If the magnetic flus ϕlinked with the primary coil is given by $\phi = \phi_0 + 4t$, where ϕ is in weber, t is time in second and ϕ_0 is a constant, the output voltage aross the secondary coil is

A. 190 V

B. 10V

C. 20V

D. 90V

Answer: B

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