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## PHYSICS

## BOOKS - TS EAMCET PREVIOUS YEAR

## PAPERS

## TS EAMCET 2017

Physics

1. A force $F$ is applied in a square plate of
length L. If the percentage error in the
determination of $L$ is $3 \%$ and in $F$ in $4 \%$ then
permissible error in the calculation of pressure is
A. $13 \%$
B. $10 \%$
C. $7 \%$
D. $12 \%$

Answer: B

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2. A Positive charge $Q$ is placed on $a$ conducting spherical shell with inner radius
$R_{1}$ and outer radius $R_{2}$. A particle with charge $q$ is placed at the center of the spherical cavity. The magnitude of the electric field at a point in the cavity, a distance $r$ from center is
A. zero
B. $\frac{Q}{4 \pi \varepsilon_{0} r^{2}}$
C. $\frac{q}{4 \pi \varepsilon_{0} r^{2}}$
D. $\frac{(q+Q)}{4 \pi \varepsilon_{0} r^{2}}$

Answer: B

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3. A swimmer wants to cross a 200 m wide river which is flowing at a speed of $2 \mathrm{~m} / \mathrm{s}$. the
velocity of the swimmer with respect to the river is $1 \mathrm{~m} / \mathrm{s}$. how far from the point directly opposite to the starting point does the swimmer reach the opposite bank?

## B. 400 m

## C. 600 m

D. 800 m

## Answer: B

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4. A coil having n trurns and resistance $R \Omega$ is
connected with a galvanometer of resistance
$4 R \Omega$ this combination is moved in time t
seconds from a magnetic flux $\phi_{1}$ weber to $\phi_{2}$
weber The induced current in the circult is

$$
\begin{aligned}
& \text { A. } \frac{\phi_{2}-\phi_{1}}{5 R n T} \\
& \text { B. }-\frac{n\left(\phi_{2}-\phi_{1}\right)}{5 R t} \\
& \text { C. }-\frac{\left(\phi_{2}-\phi_{1}\right)}{R n t} \\
& \text { D. }-\frac{n\left(\phi_{2}-\phi_{1}\right)}{R t}
\end{aligned}
$$

## Answer: B

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5. A simple pendulum of length 1 m is freely suspended from the ceiling of an elevator the time period of small oscollations as the elevator moves up with an acceleration of $2 \mathrm{~m} / \mathrm{s}^{2}$ is ( use $g=10 \mathrm{~m} / \mathrm{s}^{2}$ )

$$
\begin{aligned}
& \text { A. } \frac{\pi}{\sqrt{5}} s \\
& \text { B. } \sqrt{\frac{2}{5}} \pi s
\end{aligned}
$$

C. $\frac{\pi}{\sqrt{2}} s$
D. $\frac{\pi}{\sqrt{3}} s$

Answer: D

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6. Consider a metal ball of radius $r$ moving at a constant velocity v in a uniform magnetic field of induction of velocity forms an angle $\alpha$ with
the direction of $\bar{B}$, the maximum potential difference between points on the ball is
A. $r|\bar{B}||\bar{c}| \sin \alpha$
B. $|\bar{B}||\bar{v}| \sin \alpha$
C. $2 r|\bar{B}||\bar{V}| \sin \alpha$

D. $2 r|\bar{b} \| \bar{V}| \cos \alpha$

## Answer: C

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## 7. Each of the six ideal batteries of emf 20 v is

connected to an external resistance of $4 \Omega$ as
shown in the figure. The current through the
resistance is

A. 6 A
B. 3A
C. 4 A
D. 5 A

Answer:
8. The energy that should be added to an electron to reduce its de - broglie wavelength
from 1 nm to 0.5 nm is
A. Four -0 times the initial energy
B. equal to the initial energy
C. Two - times the initial energy
D. Three - times the initial energy

Answer: D
9. In the given circult, a charge of $+89 \mu C$ is given to upper plate of a $4 \mu F$ capacitor . At steady state, the charge on the upper plate of the $3 \mu F$ capacitor is

A. $60 \mu C$
B. $48 \mu C$
C. $80 \mu C$
D. $0 \mu C$

Answer: B

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10. The young's modulus of a material is
$2 \times 10^{11} N / m^{2}$ and its elastic limit is
$1 \times 10^{8} \mathrm{~N} / \mathrm{m}^{2}$ for a wire of 1 m length of this
material , the maximum elongation achievable
is
A. $0.2 m m$
B. 0.3 mm
C. $0.4 m m$
D. 0.5 mm

Answer: D
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11. A wooden box lying at rest on an inclined
surface of a wet wood is held at static equilibrium by a constant force F applied perpendicular to the angle of inclination is $30^{\circ}$ and the box and the inclined plane is 0.2 , the minimum magnitude of $F$ is (Use $g=10 \mathrm{~m} / \mathrm{s}^{2}$ )
A. ON as $30^{\circ}$ is less than angle of repose
B. $\leq 1 N$
C. $\leq 3.3 N$

## D. $\leq 16.3 N$

## Answer: D

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12. A meter scale made of steel , reads accirately at $25^{\circ} C$ Suppose in an experiment an accuracy of 0.06 mm in 1 m is required, the range of temperature in which the experiment can be performed with this meter scale is (

Coefficient of linear expansion of steel is $\left.11 \times 10^{-6} /{ }^{\circ} C\right)$
A. $19^{\circ} C$ to $31^{\circ} C$
B. $25^{\circ} \mathrm{C}$ to $32^{\circ} \mathrm{C}$
C. $18^{\circ} \mathrm{C} \rightarrow 25^{\circ} \mathrm{C}$
D. $18^{\circ} \mathrm{C} \rightarrow 32^{\circ} \mathrm{C}$

Answer: A

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13. Consider a solenoid carrying current supplied k by a DC source with a constant emf containing iron core inside it when the core is pulled out of the solenoid the change in current will
A. remain same
B. decrease
C. increase
D. modulate

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14. A parallel beam of light of intensity $I_{0}$ is incident on a coated glass plate. IF $25 \%$ of the incident light is reflected from the upper surface and $50 \%$ of light if reflected from the glass plate, the ratio of maximum to minimum intensity in the interference region of the reflected light is

$$
\text { A. }\left(\frac{\frac{1}{2}+\sqrt{\frac{3}{8}}}{\frac{1}{2}-\sqrt{\frac{3}{8}}}\right)^{2}
$$

B. $\left(\frac{\frac{1}{4}+\sqrt{\frac{3}{8}}}{\frac{1}{2}-\sqrt{\frac{3}{8}}}\right)^{2}$
C. $\frac{5}{8}$
D. $\frac{8}{5}$

## Answer: A

## D View Text Solution

15. A thermocal box has a total wall area ( including the lid ) of $1.0 \mathrm{~m}^{2}$ and well thickness of 3 cm . It is filled with ice at $0^{\circ} C$. If the
average temperature outside the box is $30^{\circ} \mathrm{C}$
throughout the day, the amount of ice that melts in one day is
[ Use $K_{\text {themocal }}=0.03 \mathrm{~W} / \mathrm{mk}$,
$\left.L_{\text {Fusion (ice) }}=3.00 \times 10^{5} j / K G\right]$
A. 1 kg
B. 2.88 kg
C. 25.92 kg
D. 8.64 kg

Answer: D
16. Which of the following is emitted, when
${ }_{94}^{239} \mathrm{Pu}$ decays into ${ }_{92}^{235} U$ ?
A. Gamma ray
B. Neutron
C. Electron
D. Alpha particle

Answer: D

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17. An AC generator 10 V ( rms ) at ( Rms ) at
$200 \mathrm{rad} / / \mathrm{s}$ is connected in series with a $50 \Omega$

Resistor, a 400 mH inductor and a $200 \mu F$
capacitor . The rms voltage across the inductor is
A. 2.5 V
B. 3.4 V
C. 6.7 V
D. 10.8 V

## Answer: D

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18. A wire has resistance of $3.1 \Omega$ at $30^{\circ} \mathrm{C}$ and
$4.5 \Omega$ at $100^{\circ} C$. The temperature coefficient of resistance of the wire is
A. $0.0012^{\circ} C^{-1}$
B. $0.0024^{\circ} C^{-1}$
C. $0.0032^{\circ} C^{-1}$
D. $0.0064^{\circ} C^{-1}$

## Answer:

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19. An Object is thrown vertically upward with
a speed of $30 \mathrm{~m} / \mathrm{s}$. The velocity of the object
half -a - second before it reaches the maximum height is
A. $4.9 \mathrm{~m} / \mathrm{s}$
B. $9.8 \mathrm{~m} / \mathrm{s}$
C. $19.6 \mathrm{~m} / \mathrm{s}$

## D. $25.1 \mathrm{~m} / \mathrm{s}$

## Answer: A

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20. An electron colliodes with a hydrogen
atom in its ground state and excites it to $n=3$
state. The energy given to the hydrogen atom in this inelastic collision
( neglecting the recoil of hydrogen atom ) is

$$
\text { A. } 10.2 e V
$$

B. 12.1 eV
C. 12.5 eV
D. 13.6 eV

Answer: B

- Watch Video Solution

21. Consider the motion of a particle described
by $\quad x=a \cos t, y=a \sin t$ and $z=t$. The trajectory traced by the particle as a function of time is
A. helix
B. circular
C. elliptical
D. straight line

Answer: A

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22. Consider a reversible engine of efficiency
$\frac{1}{6}$ when the temperature of the sink is reduced by $62^{\circ} C$, its efficiency gets doubled.

The temperature of the source and sink respectively are
A. 372 k and 310 K
B. 273 K and 300 K
C. $99^{\circ} \mathrm{C}$ and $10^{\circ} \mathrm{C}$
D. $200^{\circ} \mathrm{C}$ and $37^{\circ} \mathrm{C}$

Answer: A
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23. Consider a light source placed at a distance of 1.5 m along the axis facing the convex side of a spherical mirror of radius of curvature 1 m . The position (s') nature and magnification (m) of the image are
A. $s^{\prime}=0.375 \mathrm{~m}$ virtual upright, $\mathrm{m}=025$
B. $s^{\prime}=0.375 \mathrm{~m}$ real inverted $\mathrm{m}=025$
C. $\mathrm{s}^{\prime}=3.75 \mathrm{~m}$, virtual inverted $\mathrm{m}=2.5$
D. $\mathrm{s}^{\prime}=3.75 \mathrm{~m}$, real uplight, $\mathrm{m}=2.5$

## - Watch Video Solution

24. An office room contains about 2000 moles
of air. The change in the internal energy of
this much air when it is cooled from $34^{\circ} \mathrm{C}$ to
$24^{\circ} \mathrm{C}$ at constant pressure of 1.0 atm is
[ Use gamm $_{\text {air }}=1.4$ and universal gas constant $=8.314 \mathrm{~J} / \mathrm{mol}-\mathrm{K}]$
A. $-19 \times 10^{5} J$
B. $+19 \times 10^{5} \mathrm{~J}$
C. $-42 \times 10^{5} J$

## D. $+0.7 \times 10^{5} \mathrm{~J}$

## Answer: C

## D Watch Video Solution

25. A ball is thrown at a speed of $20 \mathrm{~m} / \mathrm{s}$ at an
angle of $30^{\circ}$ with the horizontal. The maximum height reached by the ball is
(Use $g=10 \mathrm{~m} / \mathrm{s}^{2}$ )
A. 2 m
B. 3 m
C. 4 m
D. 5 m

## Answer: D

## D Watch Video Solution

26. A horizonta pipeline carrying gasoline has
a cross -sectional diameter of 2 mm . If the
viscosity and density of the gasoline are
$6 \times 10^{-3}$ poise and $720 \mathrm{~kg} / / \mathrm{m}^{\wedge} 3^{\wedge}$
respectively, the velocity after which the flow becomes turbulent is
A. $>1.66 m / s$
B. $>3.33 m / s$
C. $>1.6 \times 10^{-3} \mathrm{~m} / \mathrm{s}$
D. $>0.33 m / s$

Answer: C

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27. A piece of copper and a piece of germanium are cooled from temperature to 80 K . Then which one of the following is correct ?
A. Resistance of each will increase
B. Resistance of each will decrease
C. Resistance of copper will decrease
D. Resistance of copper will increase while
that of germanium will decrease

## Answer: C

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28. A beam of light propagation at an angle $\alpha_{1}$
from a medium 1 through to another medium

2 at an angle $\alpha_{2}$ if the wavelength of light in medium 1 is $\lambda_{1}$, then the wavelength of light
in medium $2,\left(\lambda_{2}\right)$ is

$$
\begin{aligned}
& \text { A. } \frac{\sin \alpha_{2}}{\sin \alpha_{1}} \lambda_{1} \\
& \text { B. } \frac{\sin \alpha_{1}}{\sin \alpha_{2}} \lambda_{2}
\end{aligned}
$$

C. $\left(\frac{\alpha_{1}}{\alpha_{2}}\right) \lambda_{1}$
D. $\lambda_{1}$

## Answer: A

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29. An amplitude moduated signal consists of a message singnal of frequency 1 KHz and peak voltage of 5 V , moduating a carrier frequency of 1 MHz and peak voltage of 15 V . The correct description of this singnal is
A. $5\left[1+3 \sin \left(2 \pi 10^{6} t\right)\right] \sin \left(2 \pi 10^{3} t\right)$
B. $15\left[1+\frac{1}{3} \sin \left(2 \pi 10^{3} t\right)\right] \sin \left(2 \pi 10^{6} t\right)$
C. $\left[5+15 \sin \left(2 \sin \left(2 \pi 10^{3} t\right)\right] \sin \left(2 \pi 10^{6} t\right)\right.$
D. $\left[15+5 \sin \left(2 \pi 10^{6} t\right)\right] \sin \left(2 \pi 10^{3} t\right)$

Answer: B

## D Watch Video Solution

30. Which of the following principles is being used in sonar technology?
A. Newton's laws of motion
B. Reflection of electromagnetic waves
C. law's of thermodynamics
D. Reflection of ultrasonic waves

## Answer: D

D Watch Video Solution
31. A particle of mass $M$ is moving in a horizontal circle of radius R with uniform
speed $v$. When the particle moves from one point to a diametrically opposite point, its
A. momentum does not change
B. momentum changes by 2 Mv
C. Kinetic energy changes by $\frac{M v^{2}}{4}$
D. Kinetic energy changes by $M v^{2}$

Answer: B

## D Watch Video Solution

32. A billiard ball of mass $M$, moving with
velocity $v_{1}$ collides with another ball of the
same mass but at rest. If the collision is elastic, the angle of divergence after the collision is
A. $0^{\circ}$
B. $30^{\circ}$
C. $90^{\circ}$
D. $45^{\circ}$

## - Watch Video Solution

33. A planet of mass $m$ moves in a elliptical orbit around an unknown star of mass $M$ such
that its maximum an minimum distances from the star are equal to $r_{1}$ and $R_{2}$ respectively .

The angular momentum of the planet relative to the centre of the star is
A. $m \sqrt{\frac{2 G M r_{1} r_{2}}{r_{1}+r_{2}}}$
B. 0

$$
\begin{aligned}
& \text { C. } m \sqrt{\frac{2 G M\left(r_{1}+r_{2}\right)}{r_{1} r_{2}}} \\
& \text { D. } \sqrt{\frac{2 G M m r_{1}}{\left(r_{1}+r_{2}\right) r_{2}}}
\end{aligned}
$$

## Answer: A

## D View Text Solution

34. Consider a frictionless rampp on which a smooth object is made to slide down from an initial height $h$. The distance $d$ necessary to stop the object on a flat track (of coefficient of friction $\mu$ ), kept at the ramp end is
A. $h / \mu$
B. $\mu h$
C. $\mu^{2} h$
D. $h^{2} \mu$

Answer: A

D Watch Video Solution
35. A generator with a circular coil of 100 turns of area $2 \times 10^{-2} m^{2}$ is immersed in a 0.01 T magnetic field and rotated at a frequency of

50 Hz . The maximum emf which is prodiuced during a cycle is
A. 6.28 V
B. 3.44 V
C. 10 V
D. 1.32 V

Answer: A
( Watch Video Solution
36. A sound wave of frequency v Hz initially travels a distance of 1 km in air, then, it gets reflected into a water reservoir of depth 600 m
. The frequency of the wave at the bottom of
the reservoir is
$\left.V_{\text {air }}=340 m / s V_{\text {water }}=1484 m / s\right)$
A. $<v H z$
B. $>v H z$
C. $v H z$

# D. 0 ( the sound wave gets attenuated by 

## water completely )

## Answer: C

## D Watch Video Solution

37. Which of the following statement is not true?
A. the resistance of an intrinsic
semiconductor decreases with increase
in temperature

# B. Doping pure SI with trivalent impurities 

gives p - type semicondductor
C. The majority carriers $n$ - type
semiconductors are holes
D. a p-n junction can act as a
semiconducotor diose

## Answer: C

38. The deceleration of a car traveling on a straight highway is a function of its instantaneous velocity v given by $\omega=a \sqrt{v}$ where $a$ is a constant. If the initial velocity of the car is $60 \mathrm{~km} / \mathrm{h}$, the distance of the car will travel and the time it takes before it stopes are

$$
\begin{aligned}
& \text { A. } \frac{2}{3} m, \frac{1}{2} s \\
& \text { B. } \frac{3}{2 a} m, \frac{1}{2 a} s \\
& \text { C. } \frac{3 a}{2} m, \frac{a}{2} s \\
& \text { D. } \frac{2}{3 a} m, \frac{2}{a} s
\end{aligned}
$$

## Answer: D

## D View Text Solution

39. A current carrying wire in its neighbourhood produces
A. electric field
B. electric and magnetic fields
C. magnetuic field
D. no field

## Answer: C

## D Watch Video Solution

40. Consider a particle on which constant forces $\quad F_{1}=\hat{i}+2 \hat{j}+3 \hat{k} \quad \mathrm{~N} \quad$ and $F_{2}=4 \hat{i}-5 \hat{j}-2 \hat{k}$ act together resulting in a displacement from position $r_{1}=20 \hat{i}+15 \hat{j}$ $\mathrm{cm} \rightarrow r_{-} 2=7$ hatk ${ }^{\text {c }} \mathrm{cm}$. the total work done on the particle is

$$
\text { A. }-0.48 J
$$

B. $+0.48 J$
C. $-4.8 J$
D. $+4.8 J$

Answer: A

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