



PHYSICS

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PHYSICS (KANNADA ENGLISH)

MOCK TEST-3

Mcqs

1. A man standing in a lift holds a spring balance with a load of 5 kg suspended from it.

What would be the reading of the balance when the lift is descending with an acceleration of $4ms^{-2}$?

A. 1 kg

B. 2 kg

C. 3 kg

D. 4 kg.

Answer: C



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2. A particle is displaced from a position $(2\hat{i} - \hat{j} + \hat{k})$ to another position $(3\hat{i} + 2\hat{j} - 2\hat{k})$ under the action of the force $(2\hat{i} + \hat{j} - \hat{k})$. The work done by the force in arbitrary unit is :

A. 8

B. 10

C. 12

D. 16

Answer: A



3. A 50 gram bullet moving with a velocity of 10m.s^{-1} gets embedded into a 950 g stationary body. The loss in kinetic energy of the system will be

- A. 95 %
- B. 100 %
- C. 5 %
- D. 50 %

Answer: A



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4. A horizontal pipe line carries water in a stream line flow. At a point along the pipe where cross-sectional area is 10 cm^2 , the water velocity is 1 m/s and the pressure is 2000 Pa . The pressure of water at another point where the cross-sectional area is 5 cm^2 , is (density of water = 10^3 kg. m^{-3}) :

A. 200 Pa

B. 300 Pa

C. 400 Pa

D. 500 Pa.

Answer: D



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5. For a transistor, the current amplification factor $\alpha = 0.9$. This transistor connected in common emitter configuration. When the base

current changes by 0.4 mA, the change in collector current will be

A. 36 mA

B. 9 mA

C. 4 mA

D. 3.6 mA.

Answer: D



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6. A mass 'M' is suspended from a spring of negligible mass. The spring is pulled a little and then released. It executes S.H. oscillations of period T. When mass is increased by 'm', the period becomes $\frac{5}{4} T$, the ratio $\frac{m}{M}$ is :

A. $9/16$

B. $25/16$

C. $4/5$

D. $5/4$.

Answer: A



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7. A regular hexagon of side 10 cm has a charge $5\mu C$ at each of its vertices. Calculate the potential at the centre of the hexagon.

A. $2.7 \times 10^6 V$

B. $3.7 \times 10^6 V$

C. $4.7 \times 10^6 V$

D. $5.7 \times 10^6 V$.

Answer: A



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8. Two metal plates form a parallel plate capacitor. The distance between the plates is d . A metal sheet of thickness $d/2$ and of the same area is introduced between the plates. What is the ratio of the capacitances in the two cases ?

A. 4:1

B. 2: 1

C. 3: 1

D. 5: 1

Answer: B



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9. A circular coil of 100 turns has a radius of 10 cm and carries a current of 5A. The magnetic field at a point on the axis of the coil at a distance of 5 cm from the centre of the coil is :

A. $2.25 \times 10^{-3}T$

B. $3.5 \times 10^{-3}T$

C. $4.5 \times 10^{-3}T$

D. $5.25 \times 10^{-3}T$.

Answer: A



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10. Deuterons are accelerated in cyclotron that has an oscillatory frequency of 10^7 Hz and a dee radius of 50 cm. The strength of the

magnetic field needed to accelerate the deuterons is :

A. 1.21 T

B. 1.31 T

C. 1.41 T

D. 1.51 T.

Answer: A



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11. An ammeter is obtained by shunting a 30Ω galvanometer with a 30Ω resistance. The additional shunt which should be connected across it to double its range is

A. 30Ω

B. 15Ω

C. 10Ω

D. 5Ω .

Answer: C



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12. A sinusoidal voltage of peak value 283V and frequency 50Hz is applied to a series LCR circuit in which $R = 3\Omega$, $L = 25.48mH$ and $C = 786\mu F$.

The power factor.

- A. 2Ω
- B. 5Ω
- C. 10Ω
- D. 12Ω

Answer: B



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13. If the electric amplitude of the electromagnetic wave is $5Vm^{-1}$, its magnetic amplitude will be

A. $5T$

B. $1.67 \times 10^{-8}T$

C. $1.67 \times 10^{-10}T$

D. $5 \times 10^{-10}T$.

Answer: B



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14. The energy emitted per second by a black body at $1227^{\circ}C$ is E . If the temperature of the black body is increased to $2727^{\circ}C$, the energy emitted per second in terms of E is :

A. E

B. $2E$

C. $4E$

D. 16E.

Answer: D



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15. The speed of sound in a gas at N.T.P. is 300 m s^{-1} . If the pressure increases 4 times without change in temperature, the velocity of sound will be

A. 150 m s^{-1}

B. 300 ms^{-1}

C. 600 ms^{-1}

D. 120 ms^{-1}

Answer: B



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16. The length of a seconds' pendulum on the earth is 60m. What will be the length of a seconds' pendulum on the surface of moon?

Given : the value of g on the surface of moon ?

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is $1/6^{th}$ of value of g on the surface of earth.

A. 60 m

B. 360 m

C. 10 m

D. 0.479 m.

Answer: C



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17. A girl is swinging on a swing in the standing position. How will the period of swing be affected if she sits down ?

A. It will become shorter

B. It will become longer

C. It will not change

D. It will become infinite.

Answer: B



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18. A resistance of 2Ω is connected across one gap of a metre-bridge (the length of the wire is 100 cm) and an unknown resistance, greater than 2Ω , is connected across the other gap. When these resistances are interchanged, the balance point shifts by 20 cm. Neglecting any corrections, the unknown resistance is :

A. 3Ω

B. 4Ω

C. 5Ω

D. 6Ω

Answer: A



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19. A hollow metallic tube a length L and closed at one end produces resonance with a tuning fork of frequency n . The entire tube is then heated carefully. So that at equilibrium temperature its length changes by l . If the change in velocity V of sound is v , the resonance will now be produced by tuning fork whose frequency is :

A. $\frac{V - v}{4(L + l)}$

B. $\frac{V + v}{4(L - l)}$

C. $\frac{V - v}{4(L - l)}$

D. $\frac{V + v}{4(L + l)}$.

Answer: D



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20. Equal temperature difference exists between the ends of two metallic rods 1 and 2 of equal lengths. Their thermal conductivity is

K_1 and K_2 and cross-sectional areas are respectively A_1 and A_2 . The condition for equal rate of heat transfer will be

A. $K_1 A_1^2 = K_2 A_2^2$

B. $K_1 A_2 = K_2 A_1$

C. $K_2 A_1 = K_2 A_2$

D. $K_1 A_2^2 = K_2^2 A_1$.

Answer: C



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21. Statement-1 : A planet moves in a elliptical orbit around the sun. Its angular momentum remains constant.

Statement-2 : Gravitational force is a central force. Therefore, no torque acts on the planet with respect to the sun. As a result angular momentum remains conserved.

A. Statement-1 is false, Statement-2 is true.

B. Statement-1 is true, Statement-2 is true ,

Statement-2 is a correct explanation for

Statement-1.

C. Statement-1 is true, Statement-2 is true,
Statement-2 is not a correct explanation
for Statement-1.

D. Statement-1 is true, Statement-2 is false.

Answer: B



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22. Statement-1 : When light enters a prism and deviates from its normal path. The deviation of violet colour is less than that of

red colour.

Statement-2 : The velocity of the violet colour is less than the velocity of red colour.

A. Statement-1 is false, Statement-2 is true.

B. Statement-1 is true, Statement-2 is true ,
Statement-2 is a correct explanation for
Statement-1.

C. Statement-1 is true, Statement-2 is true,
Statement-2 is not a correct explanation
for Statement-1.

D. Statement-1 is true, Statement-2 is false.

Answer: A



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23. Plank's constant is represented by:

A. $[MLT^{-1}]$

B. $[MLT^{-2}]$

C. $[ML^2T^{-2}]$

D. $[ML^2T^{-1}]$.

Answer: D



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24. A body moves with uniform acceleration. If v_1, v_2 and v_3 be the average velocities in three successive intervals of time t_1, t_2 and t_3 , then :

A. $v_1 - v_2 : v_2 - v_3 = t_1 - t_2 : t_2 + t_3$

B. $v_1 - v_2 : v_2 - v_3 = t_1 + t_2 : t_2 + t_3$

C. $v_1 - v_2 : v_2 - v_3 = t_1 + t_2 : t_1 - t_3$

$$D. v_1 - v_2 : v_2 - v_3 = t_1 + t_2 : t_2 - t_3$$

Answer: B



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25. Two forces of magnitude F and $\sqrt{3}F$ act at right angles to each other. Their resultant makes an angle θ with F . The value of θ is :

A. 30°

B. 45°

C. 60°

D. 135°

Answer: C



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26. The magnitude of the vector product of two vectors is 4. The magnitude of their scalar product is $4\sqrt{3}$. The angle between the two vectors is :

A. 30°

B. 45°

C. 60°

D. 75°

Answer: A



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27. A Diwali rocket is ejecting 0.05 kg of gases per second at a velocity of 200 m//s. The accelerating force on the rocket is :

A. 10 N

B. 20 N

C. 5 N

D. 5 dynes.

Answer: A



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28. Which of the following is the relation of centripetal force?

A. $\frac{mv^2}{r}$

B. $\frac{mv}{r}$

C. $\frac{mv^3}{r}$

D. $\frac{mv^2}{r^2}$.

Answer: A



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29. A metal ball hits a wall and does not rebound, where as b a rubber ball of the same mass on hitting the wall with the same

velocity rebounds back. It can be concluded that:

A. The initial momentum of metal ball is greater than initial momentum of rubber

B. Rubber ball suffers greater change in momentum

C. Metal ball suffers greater change in momentum

D. None of these.

Answer: B



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30. A body of mass m is raised through a distance equal to the radius of the earth from earth's surface. The change in P.E. will be:

A. mgR

B. $2 mgR$

C. $3 mgR$

D. $\frac{1}{2} mgR$.

Answer: A



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31. When load is applied to a wire the extension is 3 mm, the extension in the wire of same material, length but half the radius by the same load is :

A. 0.75 mm

B. 6 mm

C. 1.5 mm

D. 12.0 mm

Answer: D



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32. If the work done in blowing a bubble of radius R is W , then the work done in blowing a bubble of radius $2R$ from that solution is :

A. $W / 2$

B. $2 W$

C. 4 W

D. $2^{1/3}W$.

Answer: C



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33. Under constant temperature, graph between P and $1/V$ is a :

A. parabola

B. straight line

C. hyperbola

D. circle.

Answer: B



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34. There are three source of sound of equal intensities with frequencies 400, 401 and 402 Hz. The no. of beats per second is :

A. 0

B. 1

C. 2

D. 3

Answer: B



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35. The density of a liquid of coefficient of cubical expansion γ is d at $0^\circ C$. When the liquid is heated to a temperature T , the change in density will be:

A. $\frac{-\gamma T d_0}{(1 + \gamma T)}$

B. $\frac{\gamma T d_0}{(1 + \gamma T)}$

C. $\frac{(\gamma + \gamma T) d_0}{\gamma T}$

D. $\frac{(\gamma - \gamma T) d_0}{\gamma T}$

Answer: A



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36. There are two spherical balls A and B of the same material with same surface finish but the radius of A is half than of B. If A and B are

heated to the same temperature and allowed to cool then :

A. rate of cooling of both is same

B. rate of cooling of A is four times that of

B

C. rate of cooling of A is twice that of B

D. rate of cooling of A is $1/4$ time that of B.

Answer: B



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37. Between the plates of a parallel plate capacitor of capacitance C , two parallel plates, of the same material and area same as the plate of original capacitor, are placed. If the thickness of these plates is equal to $\frac{1}{5}$ th of distance between the plates of original capacitor, then capacitance of new capacitor is :

A. $\frac{5}{3}C$

B. $\frac{3}{5}C$

C. $\frac{3}{10}C$

D. $\frac{10}{3}C$

Answer: A



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38. A parallel plate capacitor of capacity $100 \mu F$ is charged by a battery of 50 V. The battery remains connected and if the plates of the capacitor are brought closer so that the distance between them becomes half the

original distance, the additional energy given by battery to capacitor in joules is :

A. 125×10^{-3}

B. 12.5×10^{-3}

C. 1.25×10^{-3}

D. 0.125×10^{-3}

Answer: A



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39. A straight conductor carries a current along the z-axis. Consider the points A ($a, 0, 0$), B($0, -a, 0$), C($-a, 0, 0$) and D($a, a, 0$):

A. all four points have magnetic fields of the same magnitude.

B. all four points have magnetic fields in different directions.

C. the magnetic fields at A and C are in opposite directions.

D. the magnetic fields at A and B are mutually perpendicular.

Answer: A::B::C::D



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40. A bar magnet with poles 25.0 cm apart and of pole strength 14.4 Am rests with its centre on a frictionless point. It is held in equilibrium at 60° to a uniform magnetic field of induction 0.25T by applying a force F at right

angle to the axes, 12 cm from its pivot. The magnitude of the force is :

A. $15\sqrt{3} \text{ N}$

B. $7.5\sqrt{3} \text{ N}$

C. $3.75\sqrt{3} \text{ N}$

D. None of these.

Answer: C



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41. A superconducting ring of radius 'a' and inductance L is located in a uniform magnetic field of induction B. The plane of ring is parallel to B and the current in the ring is zero. Then the ring is turned through 90° so that plane is perpendicular to the field. What is the work done in turning the ring?

A. $\frac{\pi^2 a^4 B^2}{2L}$

B. $\frac{\pi^2 a^2 B^2}{2L}$

C. $\frac{\pi a^2 B^2}{2L}$

D. $\frac{\pi^2 a^4 B^2}{4L}$.

Answer: A



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42. An object is x times, the focal length of a concave mirror away from the principal focus.

Show that the image will be $\frac{1}{nx}$ times the

focal length of mirror away from principal

focus, where n is :

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

B. $\frac{1}{3}$

C. 1

D. 1.5

Answer: C



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43. In a Young's double slit experiment, the fringes are displaced by a distance x when a glass plate of refractive index 1.5 is introduced in the path of one of the beams. When this

plate is replaced by another plate of the same thickness, the shift of fringes is $\frac{3}{2}x$. The refractive index of the second plate is :

A. 2.25

B. 2.0

C. 1.75

D. 1.25

Answer: C



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44. The unit of expression $\mu_0 \epsilon_0$ are :

A. m / s

B. m^2 / s^2

C. s / m

D. s^2 / m^2

Answer: D



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45. Threshold wavelength for metal is $10,000\text{\AA}$. If light of wavelength 5461\AA is incident on it, then stopping potential is 1.02 V , then value of Planck's constant is :

A. $6.45 \times 10^{-34}\text{J-sec}$

B. $6.54 \times 10^{-34}\text{J-sec}$

C. $6.60 \times 10^{-34}\text{J-sec}$

D. $6.67 \times 10^{-34}\text{J-sec}$

Answer: C



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46. The hydrogen atom in the ground state excited by means of light of $\lambda = 975 \text{ \AA}$. How many different lines are possible in resultant spectrum ?

A. 4

B. 3

C. 2

D. 6

Answer: D



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47. In above question, calculate the longest wavelength produced :

A. 18800 Å

B. 9800 Å

C. 12400 Å

D. 8800 Å

Answer: A



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48. The binary number corresponding to the decimal number 49 is :

A. 1101

B. 11001

C. 110001

D. 10001

Answer: C



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49. If I_r is reflected current and I_0 is the incident current of a transmission line, then value of K_r is :

A. $K_r = \frac{I_r}{I_0}$

B. $K_r = \frac{I_0}{I_r}$

C. $K_r = \sqrt{I_r \times I_0}$

$$D. K_r = \sqrt{\frac{I_r}{I_0}}.$$

Answer: A



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