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DHARITRI

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Berhampur, Monday, December 17/ 2018

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ଉପ ସାମ୍ବୁଦ୍ଧ କେନ୍ଦ୍ରାବୁ ଆରମ୍ଭ କରି
ଜିଲ୍ଲା ମୁଖ୍ୟ ଚିକିତ୍ସାଳୟ ପର୍ଯ୍ୟନ୍ତ

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ପ୍ରକାର

ରାଜ୍ୟ ସରକାରଙ୍କ ମେଡିକାଲ କଲେଜ /
ପଞ୍ଜୀକୃତ ଘରୋଇ ଚିକିତ୍ସାଳୟ /
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ଚିକିତ୍ସାଳୟ

ସର୍ବସାଧାରଣଙ୍କ ପାଇଁ
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ନାହିଁ)

ସମସ୍ତଙ୍କ ନିମନ୍ତେ ସମ୍ମୁଖୀ
ମାଗଣୀ ସାମ୍ବୁଦ୍ଧ ସେବା

ବିକେକେଣ୍ଟାଇ, ଆର୍ଥିକ ବିଭାଗ, ହିତାଧୂକାରୀ,
ବିପିଏଲ, ଏଣ୍ଡ୍ରାଇ, ହିତାଧୂକାରୀ
ଗ୍ରାମାଳୟରେ ବାର୍ଷିକ ୩୦,୦୦୦ ଟଙ୍କାରୁ କମ୍
ଏବଂ ସହରାଳୟରେ ବାର୍ଷିକ ୩୦,୦୦୦ ଟଙ୍କାରୁ
କମ୍ ଉପାର୍ଜନ କରୁଥିବା ବ୍ୟକ୍ତି

ପରିବାର ପାଇଁ ବାର୍ଷିକ ୫ ଲକ୍ଷ ଟଙ୍କା
ଓ ମହିଳା ସଦସ୍ୟଙ୍କ ଷେତ୍ରରେ
ବାର୍ଷିକ ୩ ଲକ୍ଷ ଟଙ୍କା ପର୍ଯ୍ୟନ୍ତ
ସାମ୍ବୁଦ୍ଧ ସେବା ସହାୟତା

ଦେୟମୁକ୍ତ ନମ୍ବର
୧୫୪୩୬୯
ସକାଳ ଗତା ରୁ ରାତି ଧରିବାରେ
୧୦ଟା

ଚିକିତ୍ସା ସନ୍ତୋଷ ସମସ୍ତ ତଥ୍ୟ ଏବଂ ପଞ୍ଜୀକୃତ ଘରୋଇ ଚିକିତ୍ସାଳୟଗୁଡ଼ିକର ତାଲିକା
ସାମ୍ବୁଦ୍ଧ ଓ ପରିବାର କଲ୍ୟାଣ ଡ୍ରେବସାଇଟ୍ (www.health.odisha.gov.in),
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ସାମ୍ବୁଦ୍ଧ ଓ ପରିବାର କଲ୍ୟାଣ ବିଭାଗ,
ଓଡ଼ିଶା ସରକାର

ବିଜ୍ଞୁ ସାମ୍ବୁଦ୍ଧ କଲ୍ୟାଣ ଯୋଜନା | ସୁସ୍ଥ ଓଡ଼ିଶା, ସୁଖୀ ଓଡ଼ିଶା



Exam Mate

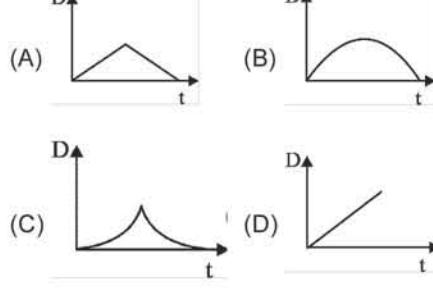


Mock Test Paper for Std X, XII CBSE Board, IIT - JEE Main & Advanced.

FOR ANSWERS VISIT : www.dharitri.com

SINGLE CORRECT ANSWER

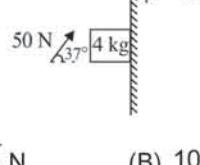
1. A particle is projected at 53° with +ve x-axis with initial velocity 20 m/s . At the same time a person starts moving with velocity of 12 m/s along +ve x-axis. Choose the correct plot of distance between particle and man with respect to time.



2. Two resistances are given as $R_1(10 \pm 0.1)\Omega$, $R_2(5 \pm 0.05)\Omega$. Find % error in their parallel combination.

- (A) 6% (B) 7%
(C) 3% (D) 1%

3. A block of mass 4 kg is being pressed against a wall as shown in figure. Coefficient of friction between wall and block is $\mu = 0.5$. Find the contact force on the given block.



- (A) $20\sqrt{5} \text{ N}$ (B) $10\sqrt{17} \text{ N}$
(C) $10\sqrt{26} \text{ N}$ (D) $10\sqrt{29} \text{ N}$

4. A particle of mass m moving along x-axis with some velocity, strikes with another particle of mass $M = 5 \text{ m}$. at rest. After collision velocity of particle of mass M makes an angle of 30° with x-axis while particle of mass 'm' moves along y-axis. Fraction of energy lost during the collision is?

- (A) 1/2 (B) 2/5
(C) 3/5 (D) 1/3

5. A block of mass m is on a stationary wedge of mass M . Wedge can slide freely on horizontal surface. If the block starts moving then there are four statements. (Given : All the surfaces are smooth)



- I. Position of centre of mass will change.
II. Total energy of system is constant.
III. If block moves to the bottom of wedge the

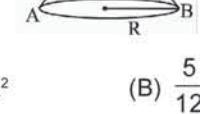
distance moved by wedge is $\frac{mh\tan\theta}{m+M}$

- IV. If block moves to the bottom of wedge, distance moved by wedge is $\frac{mh\cot\theta}{m+M}$

Which option corresponding to the statements is correct:

- (A) I, II, IV (B) II, IV
(C) II, III (D) I, II, III

6. Find moment of inertia of given hollow hemisphere about axis CD.



- (A) $\frac{2}{3}MR^2$ (B) $\frac{5}{12}MR^2$

- (C) $\frac{2}{5}MR^2$ (D) $\frac{3}{20}MR^2$

7. A satellite orbiting around earth with speed v_0 , and R as orbital radius. How much more energy would it take to escape earth's gravitational field?

- (A) $\frac{GMm}{4R}$ (B) $-\frac{GMm}{2R}$

- (C) $\frac{GMm}{2R}$ (D) $-\frac{GMm}{4R}$

8. A metal wire has length of 1 m and cross-sectional area $4.9 \times 10^{-7} \text{ m}^2$, is supporting a mass of 0.1 kg . Block is pulled downward and now performs SHM of angular frequency 140 rad/s . Find its Young's Modulus

- (A) $4 \times 10^9 \text{ N/m}^2$ (B) $2 \times 10^9 \text{ N/m}^2$
(C) $4 \times 10^8 \text{ N/m}^2$ (D) $6 \times 10^8 \text{ N/m}^2$

MOCK TEST PAPER # 1 IITJEE (Main) (PHYSICS)

Time : 1 hour

Maximum Marks: 120

MARKING INSTRUCTIONS

For each question you will be given 4 Marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (-1) Marks (NEGATIVE MARKING) will be given.

9. In an adiabatic process, for ideal gas,

$R = \frac{2}{3}C_V$. The pressure of the gas is proportional to:

- (A) $T^{5/3}$ (B) $T^{5/2}$
(C) $T^{5/4}$ (D) $T^{5/6}$

10. A cylinder is divided into two parts with the help of frictionless piston having some mass. Initially both the parts have 1 mole of ideal gas in each at 300 K . Volume of upper part is 4 times that of lower part. At what final temperature volume ratio will be 2?



- (A) 600 K (B) 750 K
(C) 900 K (D) 400 K

11. During a process work done by the gas having $\gamma = 1.5$, is equal to double of increase in internal energy. Find the molar heat capacity for the gas (R = gas constant).

- (A) 3R (B) 6R
(C) 9R (D) Zero

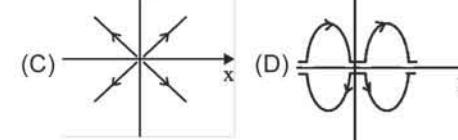
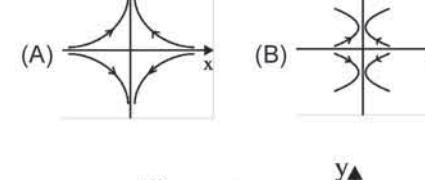
12. Two particles, performing SHM, have same frequency of oscillation and same amplitude. At $t = 0$ one of the particle is at its positive extreme (+A) and other one is at half of its amplitude in -x direction and both are approaching each other. At what time they will meet? (T = time period)

- (A) $T/3$ (B) $T/6$
(C) $T/12$ (D) $T/4$

13. Frequency of an ambulance siren appears $(4/5)$ th of initial frequency as it crosses a stationary observer. Find speed of ambulance. ($V_{\text{sound}} = 330 \text{ m/s}$)

- (A) 18.3 m/s (B) 20 m/s
(C) 36.6 m/s (D) 40 m/s

14. The potential field depends on x and y coordinates as $V = (x^2 - y^2)$. Corresponding electric field lines in x-y plane as shown in figure.



15. There is a uniformly charged insulating sphere of radius R and charge Q . There are three point A, B and C at a distance $R/3$, $R/2$ and $3R/2$ from the centre of sphere. Choose the correct

option. [V: Electric potential $k = \frac{1}{4\pi\epsilon_0}$]

$$(A) V_A - V_B = \frac{5}{12} \left(\frac{kQ}{R} \right)$$

$$(B) V_A - V_B = \frac{5}{36} \left(\frac{kQ}{R} \right)$$

$$(C) V_B - V_C = \frac{17}{48} \left(\frac{kQ}{R} \right)$$

$$(D) V_B - V_C = \frac{17}{36} \left(\frac{kQ}{R} \right)$$

16. A parallel plate capacitor without any dielectric has capacitance C_0 . A dielectric slab is made up to two dielectric slabs of dielectric constants K and $2K$ and is of same dimensions as that of capacitor plates and both the parts are of equal dimensions arranged serially as shown. If this dielectric slab is introduced (dielectric K enters first) in between the plates at constant speed, then variation of capacitance with time will be best represented by:

- (A) Total heat produced in resistor R_1 after opening the switch is $\frac{1}{2} \frac{L\epsilon^2}{R^2}$

- (B) Total heat produced in resistor R_1 after opening the switch is $\frac{1}{2} \frac{L\epsilon^2}{R^2} \left(\frac{R_1}{R_1 + R_2} \right)$

- (C) heat produced in resistor R_1 after opening the switch is $\frac{1}{2} \frac{R_2 L \epsilon^2}{R^2 (R_1 + R_2)}$

- (D) no heat will be produced in R_1

23. A lamp emits monochromatic green light uniformly in all the direction. The lamp is 3% efficient in converting electrical power to electromagnetic waves and consumes 100 W of power. The amplitude of electric field associated with radiation at a distance of 10 m from the lamp is :

- (A) 1.34 V/m (B) 2.68 V/m
(C) 5.36 V/m (D) 9.37 V/m

24. The maximum value of index of refraction of a material of a prism which allows the passage of light through it when the refracting angle of the prism is A is:

$$(A) \sqrt{1 + \sin \left(\frac{A}{2} \right)}$$

$$(B) \sqrt{1 + \cos \left(\frac{A}{2} \right)}$$

$$(C) \sqrt{1 + \tan^2 \left(\frac{A}{2} \right)}$$

$$(D) \sqrt{1 + \cot^2 \left(\frac{A}{2} \right)}$$

25. The wavefront of light beam is given by the equation $3x + y + 2z = C$ where C is a constant. The angle made by the direction of light with x-axis is:

$$(A) \cos^{-1} \left(\frac{3}{\sqrt{14}} \right)$$

$$(B) \sin^{-1} \left(\frac{3}{\sqrt{14}} \right)$$

$$(C) \cos^{-1} \left(\frac{1}{2} \right)$$

$$(D) \tan^{-1} \left(\frac{3}{\sqrt{14}} \right)$$

26. The length of compound microscope is 14 cm . The magnifying power for relaxed eye is 25. If the focal length of eye lens is 5 cm then the object distance for objective lens will be:

- (A) 1.5 cm (B) 1.8 cm
(C) 2.1 cm (D) 2.4 cm

27. Check the correctness of the following statements about Bohr model of hydrogen atom:

- I. The acceleration of the electron in $n = 2$ orbit is more than in $n = 1$ orbit.

- II. The angular momentum of the electron in $n = 2$ orbit is more than in $n = 1$ orbit.

- III. The KE of the electron in $n = 2$ orbit is less than in $n = 1$ orbit.

- (A) all the statements are correct

- (B) only (i) and (ii) are correct

- (C) only (ii) and (iii) are correct

- (D) only (iii) and (i) are correct

28. Which of the following statement is correct ?

- (A) With increase in wavelength of light, stopping potential becomes more negative

- (B) Wave nature of electron can be explained by Davisson and Germer experiment

- (C) If frequency of light gets doubled, KE_{max} of photoelectrons also gets doubled

- (D) The change in intensity of light affects stopping potential in photoelectric effect experiment

29. The modulation index of FM carrier having a carrier swing of 200 KHz and a modulation signal 10 KHz is:

- (A) 5 (B) 10
(C) 15 (D) 25

30. A circuit containing capacitors C_1 and C_2 as shown in figure is in steady state with key k_1 closed. At the instant $t = 0$, k_1 is opened and k_2 is closed then the maximum current in the circuit will be:



- (A) 1 Amp (B) 2 Amp

- (C) $\sqrt{2}$ Amp (D) $1/\sqrt{2}$ Amp.

For Answers visit: www.dharitri.com

NATIONAL ADMISSION cum SCHOLARSHIP TEST ON 30th DECEMBER 2018

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