



## PHYSICS

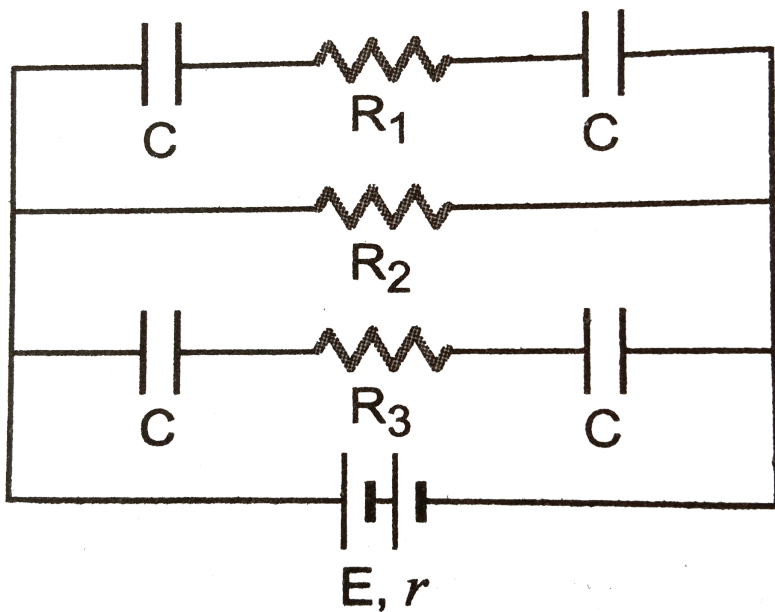
### BOOKS - CAREER POINT

### MOCK TEST 3

#### Physics

1. In Fig,  $E = 5$  volt ,  $r = 1\Omega$ ,  $R_2 = 4\Omega$ ,  $R_1 = R_3 = 1\Omega$  and  $C = 3\mu F$ . Then the numerical value of the charge on each plate of

the capacitor is

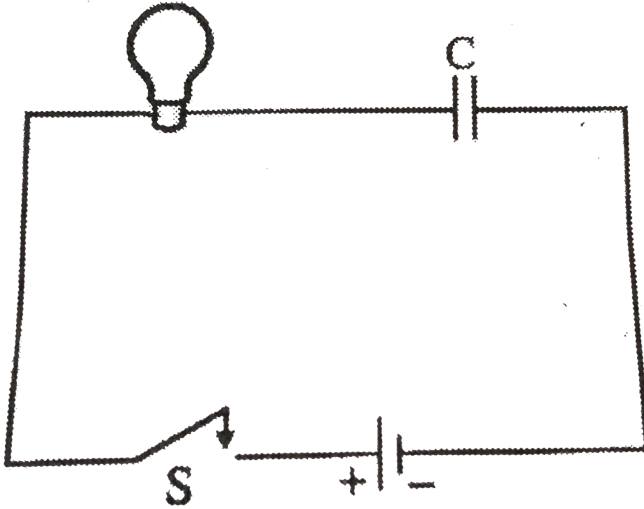


- A.  $3\mu C$
- B.  $6\mu C$
- C.  $12\mu C$
- D.  $24\mu C$

Answer: 2

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2. A light bulb, a capacitor and a battery are connected together as shown in figure, with switch S initially open. When the switch S is closed, which statement is true ?



- A. The bulb will light up for an instant when the capacitor starts charging
- B. the bulb will light when the capacitor is fully charged
- C. the bulb will not light up at all
- D. the bulb will light up and go off at regular intervals

**Answer: 1**



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3. A standing wave is produced on a string on a string clamped at one end and free at the other. The length of the string

A. must be  $\frac{n\lambda}{4}$

B. must be  $\frac{n\lambda}{2}$

C. must  $n\lambda$

D. None of these

**Answer: 4**



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4. A train approaching a railway crossing at a speed of  $120\text{kmh}^{-1}$  sounds a short whistle at frequency  $640\text{ Hz}$  when it is  $300\text{ m}$  away from the crossing. The speed of sound in air is  $340\text{ms}^{-1}$ . What will be the frequency heard by a person standing on a road perpendicular to the track through the crossing at a distance of  $400\text{ m}$  from the crossing ?

- A.  $640\text{ Hz}$
- B.  $680\text{ Hz}$
- C.  $380\text{ Hz}$
- D. None of these

**Answer: 2**

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5. The magnetic field at the centre of a circular current carrying coil of radius  $r$  is  $B_e$ . The magnetic on its axis at a distance  $r$  from the centre is  $B_a$ . The value of  $B_e : B_a$  will be :

A.  $1 : \sqrt{2}$

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

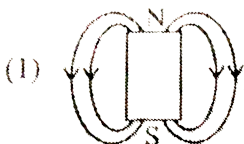
C.  $2\sqrt{2} : 1$

D.  $\sqrt{2} : 1$

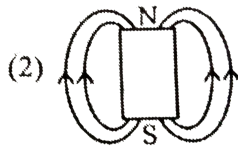
Answer: 3

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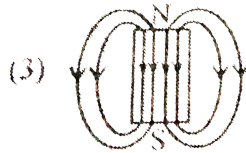
6. The magnet field lines due to a bar magnet are correctly shown in



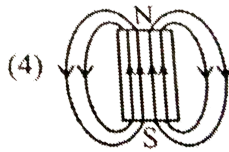
A.



B.



C.



D.

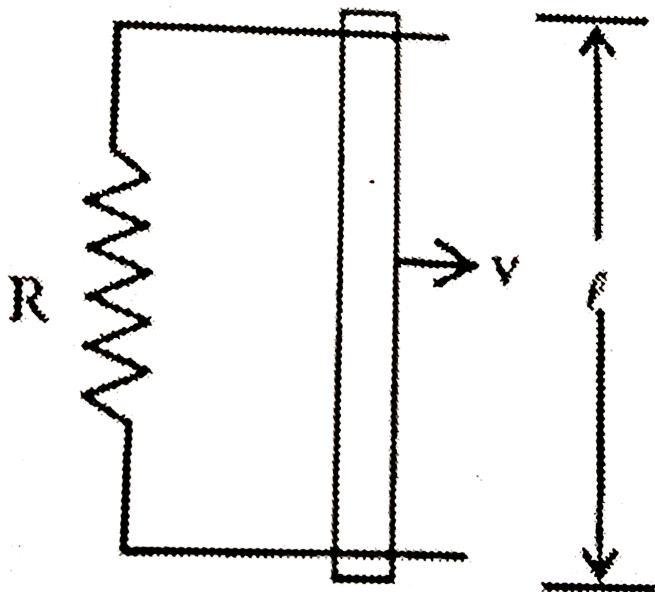
**Answer: 4**



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7. A conducting rod of resistance  $r$  moves uniformly with a constant speed  $v$ . If the rod keeps moving uniformly, then the

amount of force required is -



- A.  $\frac{vB^2l^2}{R}$
- B.  $\frac{2vB^2l^2}{(R + r)}$
- C.  $\frac{vB^2l^2}{(R + r)}$

D. zero

Answer: 3

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8. A convex lens is made out of a substance of 1.2 refractive index. The two surface of lens are convex. If this lens is placed in water whose refractive iondex is 1.33, it will behave as -

- A. convergent lens
- B. divergent lens
- C. plane glass plate
- D. like a prism

**Answer: 2**

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9. Let  $T_1$  and  $T_2$  be the time periods of two springs A and B when a mass  $m$  is suspended from them separately. Now both the springs

are connected in parallel and same mass  $m$  is suspended with them.

Now let  $T$  be the time period in this position. Then -

A.  $T = T_1 + T_2$

B.  $T = \frac{T_1 T_2}{T_1 + T_2}$

C.  $T^2 = T_1^2 + T_2^2$

D.  $\frac{1}{T^2} = \frac{1}{T_1^2} + \frac{1}{T_2^2}$

**Answer: 4**



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**10.** A thermodynamics cycle takes in heat energy at a high temperature and rejects energy at a lower temperature. If the amount of energy rejected at a lower temperature. If the amount of energy rejected at the low temperature is 3 times the amount of work done by the cycle, the efficiency of the cycle is

A. 0.25

B. 0.33

C. 0.67

D. 0.9

**Answer: 1**



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**11.** One mole of an ideal monoatomic gas at temperature  $T_0$  expands slowly according to the law  $P/V=\text{constant}$ . If the final temperature is  $2T_0$  heat supplied to the gas is -

A.  $2RT_0$

B.  $\frac{3}{2}RT_0$

C.  $RT_0$

D.  $\frac{1}{2}RT_0$

**Answer: 1**



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**12.** In two experiments with a continuous flow calorimeter to determine the specific heat capacity of a liquid, an input power of 60 W produced a rise of 10 K in the liquid. When the power was doubled, the same temperature rise was achieved by making the rate of flow of liquid three times faster. The power lost to the surrounding in each case was-

A. 20 W

B. 30 W

C. 40 W

D. 120 W

**Answer: 2**

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**13.** In a sample of hydrogen like atom all of which are in a ground state, a photon beam containing photons of various energies is passed. In absorption spectrum, five dark lines are observed. The maximum number of bright lines in the emission spectrum will be (assume that all transition take place)-

A. 21

B. 10

C. 15

D. None of these

**Answer: 3**

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14. According to Einstein's photoelectric equation, the plot of the maximum kinetic energy of the emitted photoelectrons from a metal versus frequency of the incident radiation gives a straight line whose slope

- A. depends on the nature of metal used
- B. depends on the intensity of the radiation
- C. depends on the both intensity of radiation and the nature of metal used
- D. is the same for all metals and independent of the intensity of radiation

**Answer: 4**



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15. IF the de-Broglie wavelength of a proton is  $10^{-13}m$ , the electric potential through which it must have been accelerated is

A.  $4.07 \times 10^4 V$

B.  $8.15 \times 10^4 V$

C.  $8.15 \times 10^3 V$

D.  $4.07 \times 10^5 V$

**Answer: 2**

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16. The count rate observed from a radioactive source at  $t$  second was  $N_0$  and at  $4t$  second it was  $\frac{N_0}{16}$ . The count rate observed at  $\left(\frac{11}{2}\right)t$  second will be

A.  $\frac{N_0}{128}$

B.  $\frac{N_0}{64}$

C.  $\frac{N_0}{32}$

D. None of these

**Answer: 2**

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17. Two parallel plate capacitors of capacitances  $C$  and  $2C$  are connected in parallel and charged to a potential difference  $V_0$ . The battery is then disconnected and the region between the plates of the capacitor  $C$  completely filled with a material of dielectric constant 2. The potential difference across the capacitors now becomes-

A.  $\frac{V_0}{4}$

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



C.  $3\frac{V_0}{4}$

D.  $V_0$

**Answer: 3**



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**18.** A dipole of electric dipole moment  $p$  is placed in a uniform electric field of strength  $E$ . If  $\theta$  is the angle between positive direction of  $p$  and  $E$ , then the potential energy of electric dipole is larger when  $\theta$  is-

A.  $\frac{\pi}{4}$

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

C.  $\pi$

D. zero

**Answer: 3**



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**19. Which of the following are not a unit of time ?**

(a) second (b) parsec

( c) Year (d) Light year

A. only b

B. only d

C. b and d both

D. only c

**Answer: 3**



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20. At a metro station, a girl walks up a stationary escalator in time  $t_1$ . If she remains stationary on the escalator, then the escalator takes her up in time  $t_2$ . The time taken by her to walk up on the moving escalator will be-

A.  $(t_1 + t_2) / 2$

B.  $t_1 t_2 / (t_2 - t_1)$

C.  $t_1 t_2 / (t_2 + t_1)$

D.  $t_1 - t_2$

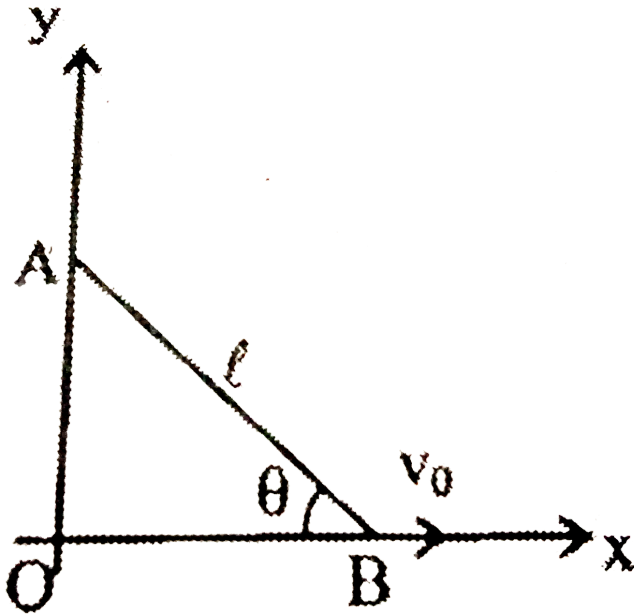
**Answer: 3**



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21. In the figure given below, the end B of the rod AB which makes angle  $\theta$  with the floor is pulled with a constant velocity  $v_0$  as shown.

The length of rod is  $l$ . At an instant when  $\theta = 37^\circ$

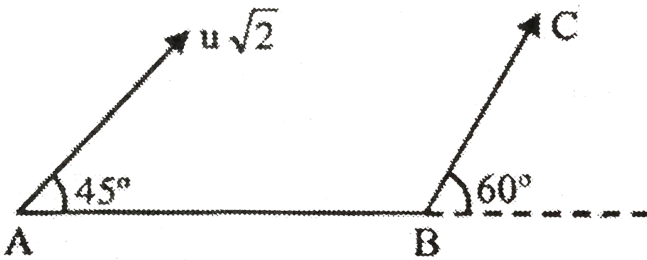


- A. Velocity of end A is  $\frac{4v_0}{3}$
- B. angular velocity of rod is  $\frac{5v_0}{6l}$
- C. angular velocity of rod is constant
- D. velocity of end a is constant

**Answer: 1**

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22. A particle is projected from a point A with velocity  $u\sqrt{2}$  at an angle of  $45^\circ$  with horizontal as shown in the figure. It strikes the plane BC at right angles. The velocity of the particle at the time of collision is



A.  $\frac{\sqrt{3}u}{2}$

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

C.  $\frac{2u}{\sqrt{3}}$

D. None

Answer: 3



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23. a simple pendulum with a bob of mass  $m$  swings with an angular amplitude of  $40^\circ$ . When its angular displacement is  $20^\circ$ , the tension in the strings is-

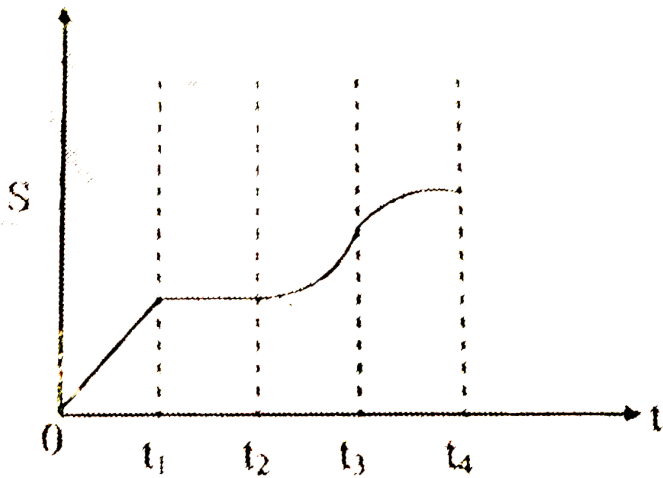
- A. less than  $mg \cos 20^\circ$
- B. greater than  $mg \cos 20^\circ$
- C. equal to  $mg \cos 20^\circ$
- D. unpredictable

**Answer: 2**



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24. A particle is moving along a straight line. Its displacement-time graph is shown



Column-I

Column-II

- |   |                   |
|---|-------------------|
| (A) Work done on particle from 0 to $t_1$     | (P) Positive      |
| (B) Work done on particle from $t_1$ to $t_2$ | (Q) Negative      |
| (C) Work done on particle from $t_2$ to $t_3$ | (R) zero          |
| (D) Work done on particle from $t_3$ to $t_4$ | (S) Unpredictable |

A.  $A \rightarrow R, B \rightarrow R, C \rightarrow P, D \rightarrow Q$

B.  $A \rightarrow S, B \rightarrow R, C \rightarrow P, D \rightarrow Q$

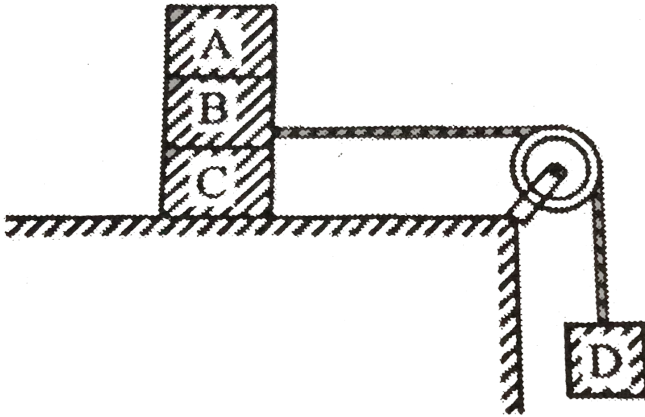
C.  $A \rightarrow R, B \rightarrow S, C \rightarrow P, D \rightarrow Q$

D.  $A \rightarrow R, B \rightarrow R, C \rightarrow Q, D \rightarrow P$

Answer: 1

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25. Three blocks of A, B and C of equal mass  $m$  are placed one over the other on a smooth horizontal ground as shown in figure. Coefficient of friction between any two blocks of A,B and C is  $1/2$ . The maximum value of mass of block D so that the blocks A,B and C move without slipping over each other is-



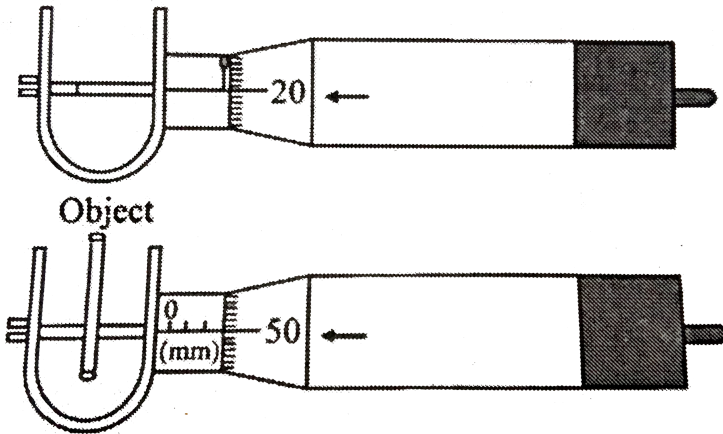
- A. 6 m
- B. 5 m
- C. 3 m
- D. 4 m



Answer: 3

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26. When a piece of wire is held diametrically in a screw gauge [pitch = 1mm, number of divisions on the circular scale=100]. The reading obtained are as shown



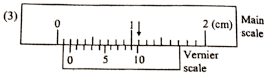
Now we have to measure the same with the help of vernier callipers [1 MSD= 1mm, 10 divisions of vernier coinciding with 9 divisions of main scale] having a negative zero error of 0.5 mm, then find which of the following figures correctly represents the reading -



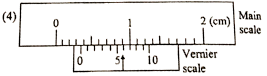
A.



B.



C.



D.

**Answer: 1**



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**27.** On the basis of detail given about two measuring instruments, select the correct statement

(i) vernier calliper having main scale of division = 0.05 cm and vernier

$$\text{scale division} = \frac{2.45}{50} \text{ cm}$$

screw gauge having pitch 0.5 mm and its circular scale division

measures 0.1 mm

- A. Both the instruments have same least count
- B. Least count of screw gauge is lesser than that of vernier callipers
- C. Both the instruments have same least count but screw gauge is more precise
- D. Both the instruments have different least count and screw gauge is more precise

**Answer: 1**

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**28.** Energy of a light photon  $E$  of wavelength  $\lambda = 600\text{nm}$  is equal to the band gap of the given semiconductor. The minimum energy needed to create an electron-hole pair is-

A. 1.02 eV

B. 2.07 eV

C. 6.3 eV

D. 12.4 eV

**Answer: 2**



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**29.** On a particular day, the maximum frequency reflected from the ionosphere is 8 MHz. On other day it was found to increase to 9 MHz. Then ratio of maximum electron densities of the ionosphere on two days will be

A.  $\frac{9}{8}$

B.  $\frac{8}{9}$

C.  $\frac{81}{64}$

D.  $\frac{64}{81}$

**Answer: 4**



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**30.** Critical angle for light going from medium (i) to (ii) is  $\theta$  . The speed of light in medium (i) is  $v$  then speed in medium (ii) is

A.  $v(1 - \cos \theta)$

B.  $v / \sin \theta$

C.  $v / \cos \theta$

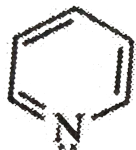
D.  $v(1 - \sin \theta)$

**Answer: 2**



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1. The hybridization states of the nitrogen atom in pyridine, piperidine and pyrrole are respectively



Pyridine



Piperidine



Pyrrole

A.  $sp^2$ ,  $sp^3$  and  $sp^2$

B.  $sp^2$ ,  $sp^3$  and  $sp^3$

C.  $sp^3$ ,  $sp^3$  and  $sp^3$

D.  $sp^2$ ,  $sp^2$  and  $sp^2$

Answer: 1



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2. A sample of Ammonium phosphate  $(NH_4)_3PO_4$  contains 3.18 moles of oxygen atoms. The number of moles of oxygen atom in the sample is

- A. 0.265
- B. 0.795
- C. 1.06
- D. 3.18

**Answer: 3**

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3. Which of the following statements is not correct?

- A. The first ionization energies (in  $\text{KJ mol}^{-1}$ ) of carbon, silicon, germanium, tin, and lead are 1086, 786, 761, 708

and 715 respectively

B. Down the group, ionization energy decreases regular from B to Tl in boron family

C. Among oxides of the elements of carbon family, CO is neutral, GeO is acidic and SnO is amphoteric

D. The 4f and 5f-inner transition elements are placed separately at the bottom of the periodic table

**Answer: 2**



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4. Polarisation is the distortion of the shape of the shape of an anion by the cation. Which of the following statements is correct ?

A. Maximum polarisation is done by a cation of high charge



- B. A large cation is likely to bring large degree of polarisation
- C. A smaller anion is likely to undergo a high degree of polarisation
- D. Minimum polarisation is done by a cation of small size

**Answer: 1**



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5. The de-Broglie wavelength of a neutron at  $927^{\circ}\text{C}$  is  $\lambda$ . What will be its wavelength at  $27^{\circ}\text{C}$ ?

- A.  $\lambda/2$
- B.  $\lambda$
- C.  $2\lambda$
- D.  $4\lambda$

**Answer: 3**

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6. In a closed flask of 5 litre, 1.0 g of  $H_2$  is heated from 300-600K.

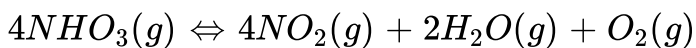
Which statement is not correct?

- A. The rate of collision increases
- B. The energy of gaseous molecules increases
- C. The number of mole of the gas increases
- D. Pressure of the gas increases

**Answer: 3**

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7. Assume that the decomposition of  $HNO_3$  can be represented by the following equation



and the reaction approaches equilibrium partial pressure of  $HNO_3$

is 2 atm. Calculate  $K_e$  in  $\left(\frac{mol}{L}\right)^3$  at 400K :

(Use :  $R = 0.08 \text{ atm-L/mol-K}$ )

A. 4

B. 8

C. 16

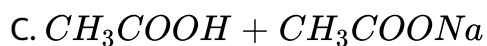
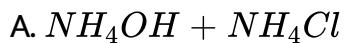
D. 32

**Answer: 4**



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8. Which of the following is a buffer solution ?



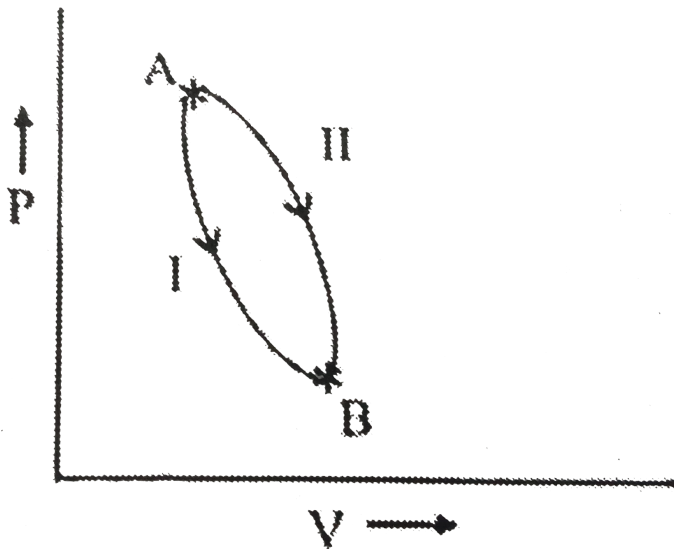
D. All of these

Answer: 4



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9. A gaseous system undergo a change of state from (1) to (2) by any of the given path -I or path-II as shown in figure



As per path-I,  $\Delta q = -400 \text{ cal}$  and  $\Delta q = -48 \text{ cal}$

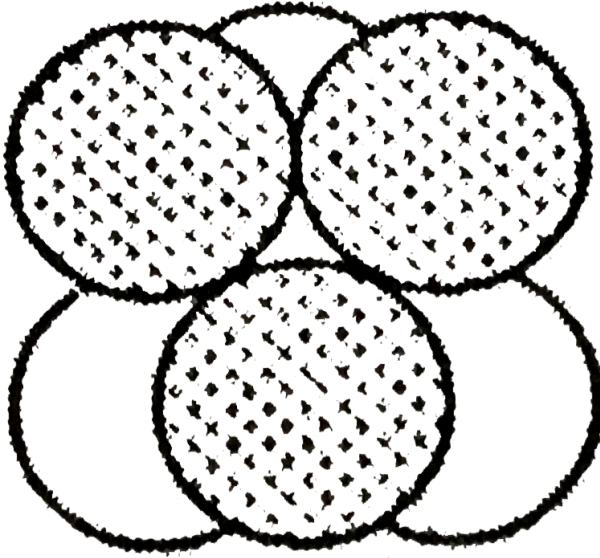
Therefore work done,  $\Delta W$  in path -(II) is-

- A.  $-338 \text{ cal}$
- B.  $-366 \text{ cal}$
- C.  $-434 \text{ cal}$
- D.  $-462 \text{ cal}$

**Answer: 1**

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10. The empty space between the shaded baals and holow balls and hollow balls as shown in the diagram is called



- A. hexagonal void
- B. octahedral void
- C. tetrahedral void
- D. Double triangular void

**Answer: 4**

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11. What will be the temperature at which a solution containing 6 g of glucose per 1000 g water with boil, if molal elevation constant for water is  $0.52/1000$  g.

A.  $1000.173^{\circ}\text{C}$

B.  $100.0173^{\circ}\text{C}$

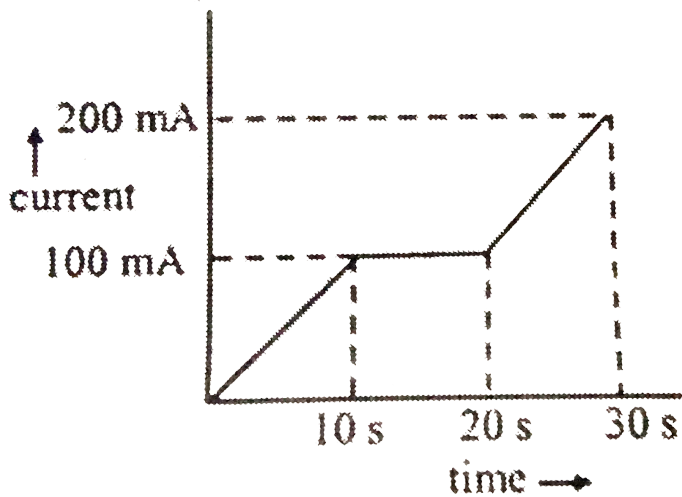
C.  $100.173^{\circ}\text{C}$

D. None

**Answer: 2**

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12. In a Cu-voltameter, mass deposited in 30 s is m gm. If the time-current graph is shown in the following figure



What is the electrochemical equivalent of Cu?

A.  $m/2$

B.  $m/3$

C.  $m/4$

D.  $\frac{m}{63.5}$

Answer: 2



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13. Plotting a graph of  $\log t_{1/2}$  against  $\log [A]_0$  of a reactant for a first order reaction, the slope will

A.  $-1$

B.  $-2$

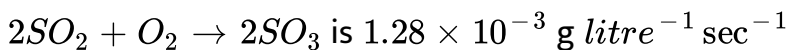
C.  $0$

D.  $+1$

**Answer: 3**

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14. The rate of disappearance of  $SO_2$  in the reaction



Then the rate of formation of  $SO_3$  in  $\text{g litre}^{-1} \text{ sec}^{-1}$  is

A.  $0.64 \times 10^3$

B.  $0.80 \times 10^3$

C.  $1.28 \times 10^{-1}$

D.  $1.60 \times 10^{-3}$

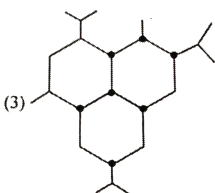
**Answer: 4**

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15. Which of the following compound have  $1^\circ$ ,  $2^\circ$ ,  $3^\circ$  and  $4^\circ$  C present in given compounds-



B.



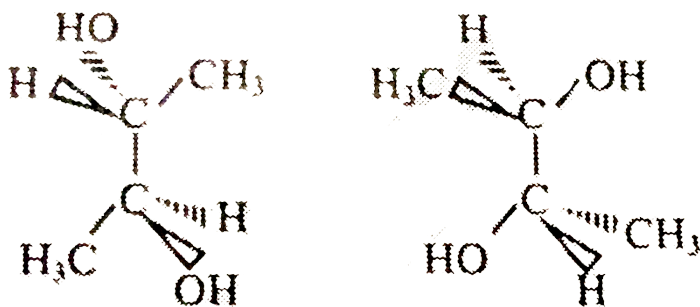
C.



Answer: 4

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16. Relate the following compounds



- A. identical
- B. enantiomers
- C. diastereomers
- D. different compounds

Answer: 1

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17. Which has maximum b,p and m,p out of :



I



II



III

A. I in both cases

B. I, II

C. I, III

D. II, I

Answer: 3

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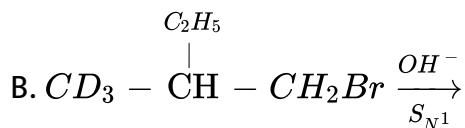
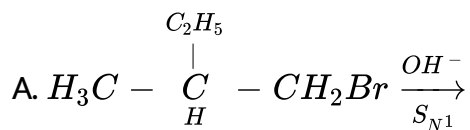
18. Action of heat on a mixture of sodium propionate and sodalime produces :

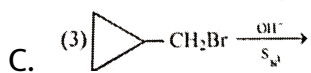
- A. methane
- B. ethane
- C. propane
- D. ethylene

Answer: 2

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19. In which case racemisation takes place ?





D. All of these

**Answer: 2**

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20. Which of the following molecule do not give  $\text{Br}_2/\text{Water}$  test

A. Phenol

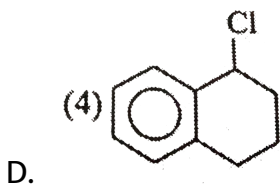
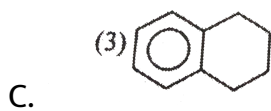
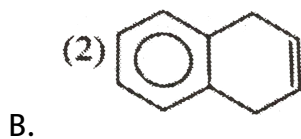
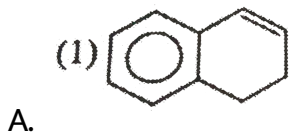
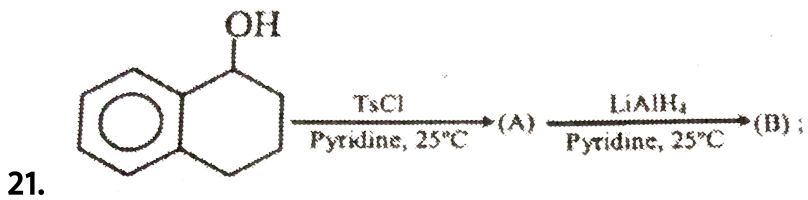
B. Ethane

C. Benzene

D. Aniline

**Answer: 3**

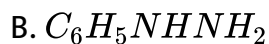
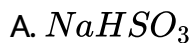
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Answer: 3

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22. the reagent used for the separation of acetaldehyde from acetophenone is-



Answer: 1

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23. Which of the following is not oxidised by aqueous  $Br_2$  ?

A. D-Fructose & D-Ribulose

B. D-Galactose & D-Erythrulose



C. D-Mannose & D-Fructose

D. D-Glucose & D-Ribose

**Answer: 1**



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24.  $CCl_4$  is inert towards hydrolysis but  $SiCl_4$  is readily hydrolysed because :

- A. Carbon cannot expand its octet but silicon can expand its octet
- B. Ionisation potential of carbon is higher than silicon
- C. Carbon forms double and triple bonds
- D. Electronegativity of carbon is higher than that of silicon

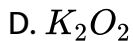
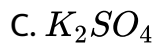
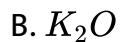
**Answer: 1**



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25. Salt  $P + Q \rightarrow R \xrightarrow{BaCl_2}$  white ppt

(P) is paramagnetic in nature and contains about 55% K. So (P) is

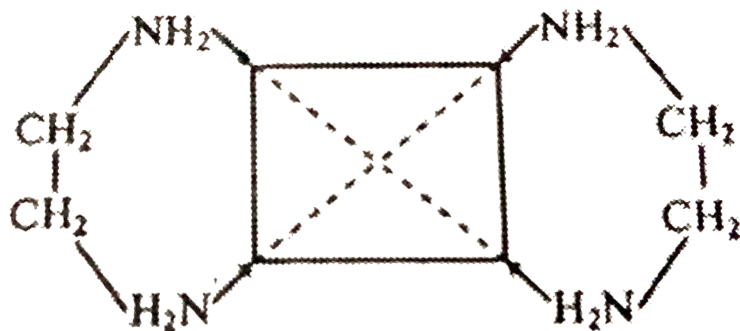


**Answer: 2**



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26. A square planer complex represented as :



A. Geometrical isomerism

B. Optical isomerism

C. Linkage isomerism

D. None of these

Answer: 4



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27. Three test tubes contain aqueous solutions as under

I. KCN

II.  $Fe(CN)_2$

III. Mixture of KCN,  $Fe(CN)_2$  in molar ratio 4 : 1

pick up the correct statement

A. both I and III will give test for  $CN^-$

B. Both II and III will give test for  $CN^-$

C. Solution III will neither give test for  $CN^-$  nor  $Fe^{+2}$  ions

D. Electrical conductivity of all solution will be same

**Answer: 3**



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28. Which is known as blister copper ?

- A. Pure copper
- B. 98% copper
- C. Ore of copper
- D. Alloy of copper

**Answer: 2**

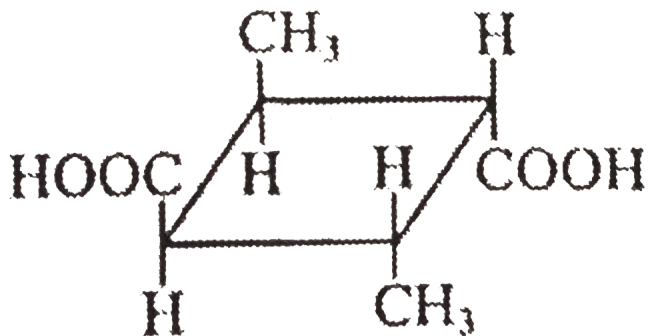


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29. 

- A. Benzoic acid
- B. Phenylacetic acid
- C. Benzyl alcohol
- D. Benzamide

**Answer: 3**



30.

The above configuration is

- A. plane of symmetry
- B. axis of symmetry
- C. centre of symmetry
- D. not any type of symmetry

Answer: 3

