SHIKSHA NATION

JEE MAIN-2026

Test Date: 28th Jan 2026 (First Shift)

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

IMPORTANT INSTRUCTIONS

- The test is of **3 hours** duration.
- This test paper consists of 75 questions. Each subject (PCM) has 25 questions. The maximum marks are 300.
- This question paper contains Three Parts. Part-A is Physics, Part-B is Chemistry and Part-C is Mathematics. Each part has only two sections: Section-A and Section-B.
- Section - A: Attempt all questions.
- Section - B: Attempt all questions.
- Section - A (01–20) contains 20 multiple choice questions which have only one correct answer. Each question carries +4 marks for correct answer and –1 mark for wrong answer.
- Section - B (21–25) contains 5 Numerical value based questions. The answer to each question should be rounded off to the nearest integer. Each question carries +4 marks for correct answer and -1 mark for wrong answer.

Memory Based Questions

PHYSICS

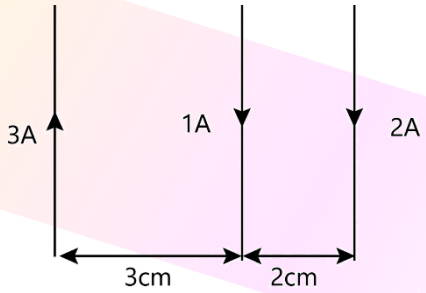
1. A lens of focal length $f = 18$ cm has a refractive index $3/2$. It is immersed in water of refractive index 4/3. The change in the focal length is $a \times f$. The value of a is:

Ans: (3)

2. A body of mass 5 kg is placed on a rough inclined plane of angle 30° and coefficient of friction $\sqrt{3}/2$. Find the force required to push the body down at constant velocity.

Ans: 12.5

3. There are three long parallel wires in a plane as shown in the figure. Find the force on 15 cm of length of the middle wire.



(1) $5\mu N$ (2) $7\mu N$ (3) $6\mu N$ (4) μN

Ans: 3

4. Solid sphere with radius 10 cm is rotating about an axis which is at 15 cm from the center of mass (COM) of the sphere. The radius of gyration is $\sqrt{n}$ cm. The value of n is:

Ans: 265

5. The equation of an electromagnetic wave (EMW) in a medium is given by $E = 2\sin(2\times10^{15}t - 10^{7}x)$. Find the refractive index of the medium.

(1) $3/2$ (2) 2 (3) $5/3$ (4) $4/3$

Ans: 1

6. For a circular coil of radius R, the magnetic field at the center of the coil is $B_0 = 16\mu T$. What will be the magnetic field on the axis at a distance $x = \sqrt{3}R$ from the center?

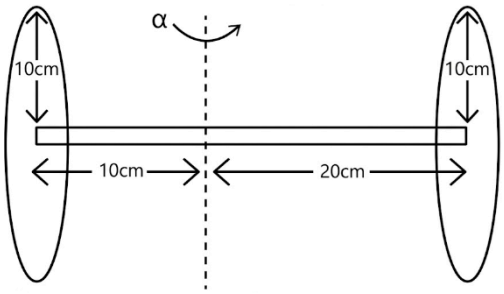
(1) $\frac{1}{4}\mu T$ (2) $\frac{1}{2}\mu T$ (3) $4\mu T$ (4) $2\mu T$

Ans: 4

7. From a pipe which is 5 m from the ground level, water is leaking at a regular rate. When the 6^{th} water drop falls from the tap, the first drop reaches the ground. Find the distance travelled by the 4^{th} drop at that instant.

Ans: 0.8

8. If the mass of a disc and the mass of a rod are $600\ g$ each. If the value of torque about the given axis is 43×10^5 dyne cm, then the value of angular acceleration α is:



Ans: 10.6 rad/s^2

9. An atom ${}^{8}_{3}X$ is bombarded with a range of fundamental particles for 10 sec. The atom absorbed 10 electrons, 10 protons and 9 neutrons. Find the ratio of initial and final surface area of the nucleus.
Ans: 4:9

10. Two batteries with emf E and internal resistance r are connected to a 6Ω resistor in both series and parallel combination. The current is same in both the combinations. Find the internal resistance.
Ans: 6

11. Electric current in a circuit is given by $i = i_0(t/T)$ for period $t=0$ to $t=T$. Find the rms current.

(1) $\frac{i_0}{\sqrt{5}}$ (2) $\frac{i_0}{\sqrt{2}}$ (3) $\frac{i_0}{2}$ (4) $\frac{i_0}{\sqrt{3}}$

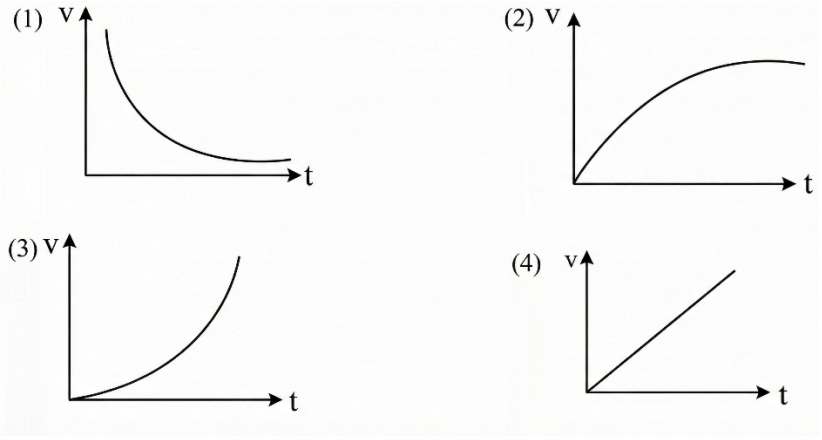
Ans: 4

12. The position of a particle is given by $x = A\sin(\omega t)$. The potential energy is minimum at $t=\frac{T}{2\beta}$. where T is time period. Find the minimum value of positive β.

(1) $1/2$ (2) 1 (3) $1/3$ (4) $1/6$

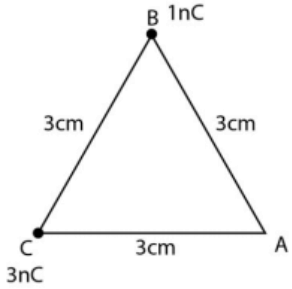
Ans: 1

13. An object is being dropped from height h above the ground. Apart from force of gravity an additional drag force $F=-kv$ acts on the object. Find the graph of v versus t. (1)



Ans: 2

14. Two point charges $1nC$ and $3nC$ are placed at the two corners of an equilateral triangle of side $3\ cm$. The work done in bringing a charge of $3nC$ from infinity to the third corner of the triangle is:



Ans: $3.6\times10^{-6}\ J$

15. In the potentiometer when the cell in the secondary circuit is shunted with 4Ω resistance, the balance is obtained at a length $120\ cm$ of wire. Now when the same cell is shunted with 12Ω resistance the balance is shifted to a length of $180\ cm$. The internal resistance of the cell is_____ Ω:

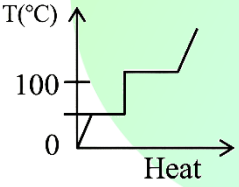
(1) 6Ω (2) 3Ω (3) 4Ω (4) 12Ω

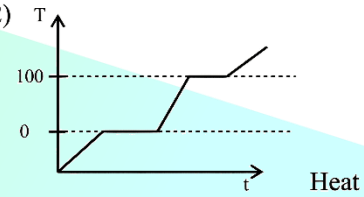
Ans: 3

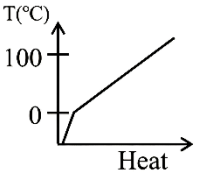
16. If $10\ kg$ of ice at $-10^{\circ}C$ is mixed with $100\ kg$ of water at $25^{\circ}C$, then the resultant temperature in equilibrium for the mixture shall be: (Given: $S_{ice}=0.5\ cal/gm^{\circ}C$, $S_{water}=1\ cal/gm^{\circ}C$, $L_f=80\ cal/gm$)

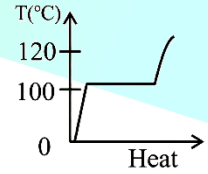
Ans: $15^{\circ}C$

17. Heat is supplied to water at a constant rate. The best representation of temperature versus heat supplied graph for water in the range $-20^{\circ}C$ to $120^{\circ}C$.

(1) 

(2) 

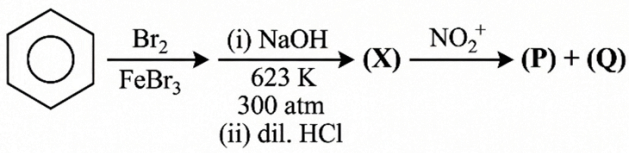
(3) 

(4) 

Ans: 2

CHEMISTRY

1 In Carius method of estimation of 'Br', 1.53 g of an organic compound gave 1 g of AgBr. The percentage of Br in organic compound is _____.
(Atomic mass of Ag & Br is 108 & 80 u respectively):
(1) 35.23 (2) 43.53 (3) 27.81 (4) 22.71
Ans: 3

2. 

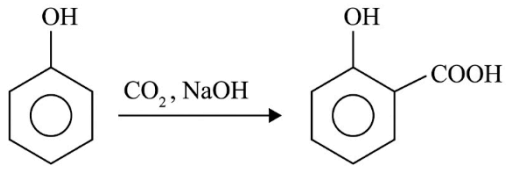
These can be separated by:
(1) Simple distillation
(2) Fractional distillation
(3) Steam distillation
(4) Sublimation
Ans: 3

3. In period 4 of the periodic table which elements have the highest and lowest atomic radii respectively?
(1) K and Br (2) Na and Cl (3) K and Se (4) Rb and Br
Ans: 1

4. Consider the following nickel complexes:
$A = [Ni(CN)_4]^{2-}$
$B = [Ni(CO)_4]$ $C = [NiCl_4]^{2-}$
Which of the following options correctly describes the magnetic behaviour (paramagnetic/diamagnetic) of these complexes?
(1) A, B are diamagnetic; C is paramagnetic
(2) A, B are paramagnetic; C is diamagnetic
(3) A, C are diamagnetic; B is paramagnetic
(4) A, C are paramagnetic; B is diamagnetic
Ans: 1

5. Consider the following ions:
I. $CH_3 - \overset{-}{C}H_2$
II. $CH_2 = \overset{-}{C}H$
III. $HC \equiv C^-$ Stability of ions is in the order:
(1) III > II > I (2) II > III > I (3) I > II > III (4) I > III > II
Ans: 1

6.



Which of the following statements is incorrect?

(1) P is more acidic than Q

(2) Q is more acidic than P

(3) Q is soluble in $NaHCO_3$

(4) P and Q both are soluble in NaOH

Ans: 1

7. An organic compound is given. It undergoes 1^{st} order decomposition. It decomposes to $1/8$ and $1/10$ in time $t_{1/8}$ and $t_{1/10}$ respectively. Find out: $\frac{t_{1/8}}{t_{1/10}} \times 10 =$ _____

Ans: 12.67

8. Given below are two statements.

Statement I: Given the molecules XeF_4, SiF_4, SeF_4 and BF_4^-, all the compounds have two different E-F bond lengths, where E is the central atom.

Statement II: Among the species O_2^+, O_2, O_2^- and F_2, the species O_2 has the highest bond order.

In the light of the above statements, which is the correct option?

(1) Both statement-I and statement-II are correct

(2) Both statement-I and statement-II are incorrect

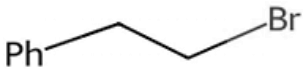
(3) Statement-I is correct and statement-II is incorrect

(4) Statement-I is incorrect and statement-II is correct

Ans: 2

9. $Ph - CH = CH_2 \xrightarrow[(PhCOO)_2]{HBr} Product$

Correct statement(s) regarding product:

(a) 

is minor product

(b) Benzene also forms a by-product

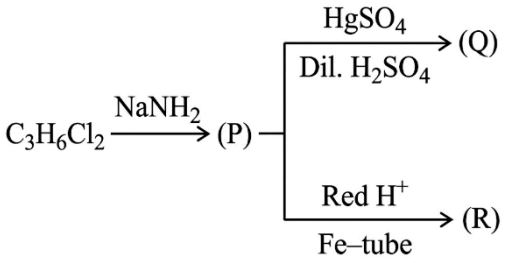
(c) Reaction follows free radical mechanism

(d) In absence of peroxide carbocation mechanism is followed

(1) b, c (2) a, c, d (3) c, d (4) a, c, d

Ans: 3

10.



Ratio of hydrocarbon in R & Q :

(1) 3:1 (2) 2:3 (3) 2:1 (4) 3:2

Ans: 1

11. For equivalence point X mL of 0.02 M HCl is treated with 5 mL of 0.02 M of a weak base. The pK_b of weak base is 5.69 and the pH of the resulting solution is Y at half of the equivalence point. The value of $(x+y)$ is:

(1) 15 (2) 8.81 (3) 13.31 (4) 3.81

Ans: 3

12. Choose the correct statements in respect of hydrides of Group-15.

A. Reducing power increases down the group.

B. Basic nature increases down the group.

C. Stability decreases down the group.

D. Boiling point decreases regularly down the group.

(1) A, B and C only (2) A, B and D only (3) A and C only (4) B, C and D only

Ans: 3

13. The wave number of three spectral lines of H-atom are given. Identify the correct set of spectral lines belonging to Balmer series.

(1) $\frac{5R}{36}, \frac{3R}{16}, \frac{21R}{100}$ (2) $\frac{3R}{4}, \frac{3R}{16}, \frac{7R}{144}$ (3) $\frac{7R}{144}, \frac{3R}{16}, \frac{16R}{255}$ (4) $\frac{5R}{36}, \frac{3R}{16}, \frac{21R}{24}$

Ans: 1

14. Calculate pH of 10 mM weak acid (HA) dissociated in water. Assume α to be negligible.

Given: $pK_a = 4$.

Ans: 3

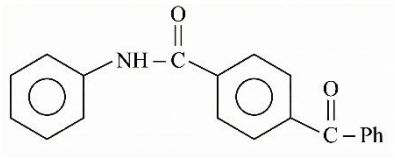
15. 500 mL, 1.2 M KI is completely reacted with 0.2 M, 500 mL $KMnO_4$ solution in basic medium. I^- is oxidised to I_2. The liberated I_2 reacts with 0.1 M $Na_2S_2O_3$ solution. Then find volume (in L) of $Na_2S_2O_3$ solution required to react with liberated I_2.

Ans: 3L

16. Select correct reaction:

(1) $Ph-\overset{\overset{O}{||}}{C}-NH_2 \xrightarrow{KOBr} Ph-NH_2$

(2) $Ph-\overset{\overset{O}{\|}}{C}-NH_2 \xrightarrow{LiAlH_4} Ph-NH_2$

(3) $Ph-NH-\overset{\overset{O}{\|}}{C}-Ph \xrightarrow[AlCl_3]{Ph-\overset{\overset{O}{\|}}{C}-Cl,}$ 

(4) $Ph-CN \xrightarrow{Na+EtOH} Ph-NH_2$

Ans: 1

17. Spherical node shown in Fig-1 is best represented by which point in Fig-2?

Fig. 1

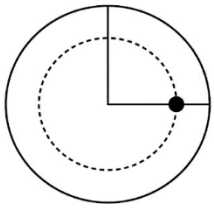
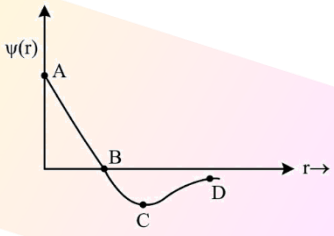


Fig. 2



(1) A (2) B (3) C (4) D

Ans: 2

18. Among the following coloured ion is/are:

(1) Ti^{3+} and V^{3+} (2) Ti^{3+} and Sc^{3+} (3) Ti^{4+} and V^{3+} (4) V^{2+} and Sc^{3+}

Ans: 1

19. Observe the following reaction:

$$C_3H_6Cl_2 \xrightarrow[NaNH_2]{excess}(X) \xrightarrow[H_2O]{Hg^{2+},H^+}(Y)$$

The product (Y) gives which of the following tests?

(1) Tollen's test (2) Lucas test (3) Iodoform test (4) Fehling's test

Ans: 3

MATHEMATICS

1. Let $f(x)$ be a polynomial function such that $f(x^2+1)=x^4+5x^2+2$. The value of $\int_0^3 f(x)dx$ is:

Ans: $\left(\frac{33}{2}\right)$

2. If α and β $(\alpha<\beta)$ are roots of the equation $\lambda x^2-(\lambda+3)x+3=0$ and $\frac{1}{\alpha}-\frac{1}{\beta}=\frac{1}{3}$, then the sum of all possible values of λ is:

(1) 8 (2) 4 (3) 2 (4) 6

Ans: 4

3. If $g(x)=3x^2+2x-3$, $f(0)=-3$, and $4g(f(x))=3x^2-32x+72$. Then the value of $f(g(2))$ is:

(1) $-25/6$ (2) $25/6$ (3) $-7/2$ (4) $7/2$

Ans: 4

4. Consider the 10 observations: 2, 3, 5, 10, 11, 13, 15, 21, a, b such that the mean of the observations is 9 and the variance is 34.2.

Then, the mean deviation about the median of observations is:

(1) 3 (2) 5 (3) 6 (4)7

[Answer:2]

5. Let $\vec{a},\vec{b},\vec{c}$ be three unit vectors such that $|\vec{a}-\vec{b}|^2+|\vec{b}-\vec{c}|^2+|\vec{c}-\vec{a}|^2=9$ and $|2\vec{a}+k\vec{b}+k\vec{c}|=3$, then the positive value of k is:

Ans: 5

6. If $\frac{\tan(A-B)}{\tan A}+\frac{\sin^2 C}{\sin^2 A}=1$; $A,B,C\in(0,\pi/2)$, then:

(1) $\tan A, \tan C, \tan B$ are in G.P.

(2) $\tan A, \tan B, \tan C$ are in G.P.

(3) $\tan A, \tan B, \tan C$ are in A.P.

(4) $\tan A, \tan C, \tan B$ are in A.P.

Ans: 2

7. Let $S=\{x^3+ax^2+bx+c; a,b,c\in\mathbb{N} \text{ and } a,b,c\le 20\}$ be a set of polynomials. Then the number of polynomials in S, which are divisible by x^2+2 is:

(1) 20 (2) 10 (3) 6 (4) 120

Ans: 2

8. Let $\tan(\pi/4+\frac{1}{2}\cos^{-1}(2/3))+\tan^{-1}(\frac{1}{2}\sin^{-1}(2/3))=k$. The number of solutions of the equation $\sin^{-1}(kx-1)=\sin^{-1}x-\cos^{-1}x$ is:

Ans: 1

9. The value of $\sum_{k=1}^{\infty}(-1)^{k+1}\left(\frac{k(k+1)}{k!}\right)$ is:

(1) $e/2$ (2) $2/e$ (3) $\sqrt{e}$ (4) $1/e$

Ans: 4

10. Let ABC be an equilateral triangle with the orthocenter at the origin and then BC^2

(1) 3 (2) 2 (3) 4 (4) 5

Ans: 1

11. Let $S=\{1,2,3,4,5,6,7,8,9\}$. Let x be the number of 9-digit numbers formed using the digits of the set S such that, only one digit is repeated and it is repeated exactly twice. Let y be the number of 9-digit numbers formed using the digits of the set S such that, only two digits are repeated and each of these is repeated exactly twice. Then:

(1) $56x=9y$ (2) $9x=2y$ (3) $21x=4y$ (4) $45x=7y$

Ans: 3

12. $\lim_{x\to 0}\frac{\ln(\sec(ex)\sec(e^2x)\sec(e^3x)\ldots\sec(e^{10}x))}{e^2-e^{2\cos x}}$

Ans: $\frac{e^{20}-1}{2(e^2-1)}$

13. The area of region $R=\{(x,y):xy\le 8,1\le y<x^2,x>0\}$ is:

Ans: $\frac{2}{3}(24\ln 2-7)$

14. Let z be a complex number such that $|z-6|=5,|z+2-6i|=5$, then $z^3+3z^2-15z+141=\ldots$

Ans: 50

15. Let $A=\{1,2,3,\ldots,9\}$; xRy if $x-y$ is a multiple of 3.

S_1: Number of elements in R is 36.

S_2: R is an equivalence relation.

(1) S_1 & S_2 both are correct (2) S_1 is correct but S_2 is not correct

(3) S_2 is correct but S_1 is not correct (4) S_1 & S_2 both are incorrect

Ans: 3

16. Let S be the number of 4-digit numbers abcd where product of digits is 20. Let P be the number of 5-digit numbers abcde where product of digits is 20, then $S+P$ is equal to:

Ans: 74

17. A bag containing 10 balls out of which k are red balls and $(10-k)$ are black balls. If 3 balls are drawn from the bag and the three balls are black, then the probability of the balls are 9 black and 1 red is p/q, then $p+q$ is:

Ans: 69

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