बेतियाहाता चौक पर पिछले 21 वर्षों से संचालित पूर्वांचल की No.1 कोचिंग
Arvind Tripathi & Vikas Agrawal's
MOMENTUM
बेतियाहाता चौक Head Office | खजांची चौक Branch Office
IIT-JEE | NEET (UG) | Foundations

Memory Based
Answers & Solutions

Time : 3 hrs. *for* M.M. : 300

JEE (Main)-2025 (Online) Phase-2

(Physics, Chemistry and Mathematics)

IMPORTANT INSTRUCTIONS:

(1) The test is of **3 hours** duration.

(2) This test paper consists of 75 questions. Each subject (PCM) has 25 questions. The maximum marks are 300.

(3) 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**.

(4) **Section - A :** Attempt all questions.

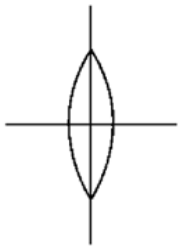
(5) **Section - B :** Attempt all questions.

(6) **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.

(7) **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.

PHYSICS

1. The thin Biconvex lens is divided in to 4 equal parts by plane AB and CB. The original power is 4D. The after dividing power of each piece is



a) 2D b) 4D c) D d) 8D

Ans: (a)

2. **Assertion:-** simple pendulum is taken on a planet of mass 4 times of earth and radius 2 time of earth then the time period is remains constant

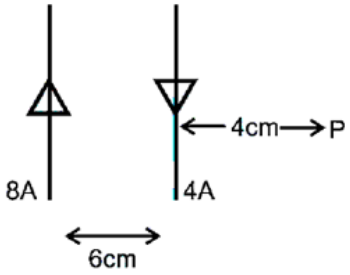
Reason:- Time period of simple pendulum is constant on earth and on any other planet

a) A is true and R is false b) Both A and R are true

c) A is false and R is true d) Both A and R are false

Ans: (a)

3. Find (B_{net}) at point P (in T)?



a) 4×10^{-8} b) 4×10^{-4} c) 4×10^{-6} d) 4×10^{-10}

Ans: (c)

4. Find the correct dimensional formula for the capacitance in terms of M, L, T and C where they stand for unit of mass, length, time and charge.

a) $[C^2M^{-1}L]$ b) $[C^2M^{-1}L^{-2}T^2]$ c) $[C^2M^{-1}L^{-2}]$ d) $[CM^{-1}L^{-2}T^2]$

Ans: (b)

5. The maximum percentage error in the measurement of density of a wire is

$m = (0.60 \pm 0.003)$g

$r = (0.50 \pm 0.01)$cm

$l = (10.00 \pm 0.05)$cm

a) 2% b) 5% c) 6% d) 3%

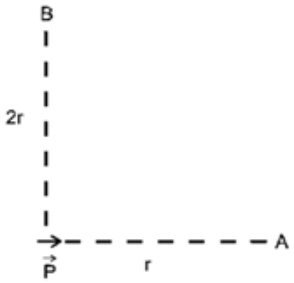
Ans: (b)

6. Given position vector and Force $r = \hat{i} + \hat{j} + \hat{k}$, $F = 2i + j + 2k$. Find Torque

a) $\sqrt{4}$ b) $\sqrt{5}$ c) $\sqrt{3}$ d) $\sqrt{2}$

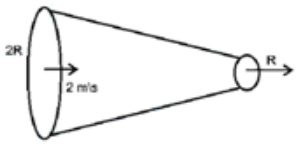
Ans: (d)

7. If $E_A=E_0$ & $V_A=V_0$ then find E_B and V_B



a) $\frac{E_0}{16}, 0$ b) $\frac{E_0}{24}, 0$ c) $\frac{E_0}{18}, 0$ d) $\frac{E_0}{14}, 0$

Ans: (a)

8. 

Find V=?

a) 6m/s b) 10m/s c) 8m/s d) 4m/s

Ans: (c)

9. A ball of mass 100 g thrown at a speed of 20 m/s with angle 60° with horizontal. Find the decrease in kinetic energy from point of throwing of ball to max height.

a) 12J b) 15J c) 25J d) 18J

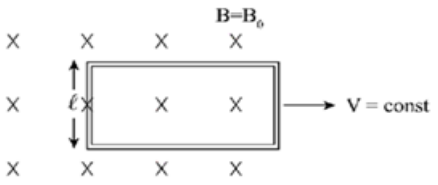
Ans: (b)

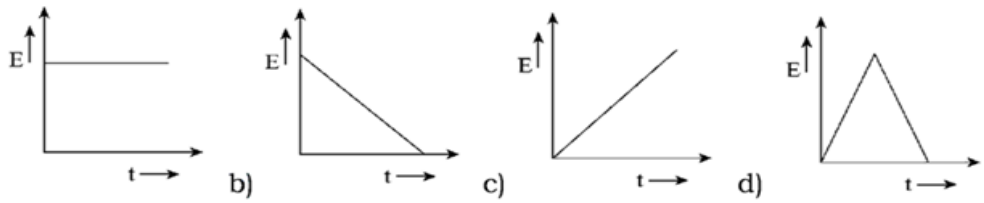
10. For a diatomic gas if $\gamma_1 = C_p/C_v$ for rigid molecules and $\gamma_2 = C_p/C_v$ for another diatomic molecule having vibrational modes then

a) $\gamma_2 < \gamma_1$ b) $\gamma_2 > \gamma_1$ c) $\gamma_2 = \gamma_1$ d) $\gamma_2 = 2\gamma_1$

Ans: (a)

11. Find the correct plot of EMF versus time when a rectangular wire frame is been taken out of uniform magnetic field region with constant speed as shown





Ans: (a)

12. **Assertion:-** In a YDSE experiment the fringe of red colour is wider as compared to the fringe of blue colour

Reason:- The fringe width is directly proposition to the wave length of light

a) Both A and R true and R is the correct explanation of A

b) Both A and R true and R is the not correct explanation of A

c) A is true and R is false

d) A is false and R is true

Ans: (a)

13. Force on the particle is given by $\vec{F} = 2\hat{\imath} - 2\hat{\jmath} + 2\hat{k}$ and its position is given by $\vec{r} = \hat{\imath} + b\hat{\jmath} + \hat{k}$ and work done is said to be zero then the value of b is

a) 2 b) 1/2 c) 5 d) 9

Ans: (a)

14. An electron is moving in a magnetic field B in a circular orbit. Assume Bohr's quantisation to be valid. Find the radius of orbit in 1st excited state?

a) $\sqrt{\frac{4h}{\pi Be}}$ b) $\sqrt{\frac{h}{2\pi Be}}$ c) $\sqrt{\frac{h}{\pi Be}}$ d) $\sqrt{\frac{2h}{\pi Be}}$

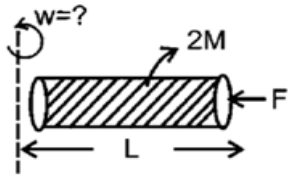
Ans: (c)

15. In a LCR circuit the current amplitude at resonance is I. If the value of resistance is doubled then find the new current amplitude at resonance?

a) I b) $\frac{I}{2}$ c) 2I d) 4I

Ans: (b)

16. Find the angular speed of the cylinder of length L if the force exerted by the ideal fluid of mass 2M on the outer face of the cylinder is F



a) $\sqrt{\frac{F}{ml}}$ b) $\sqrt{\frac{F}{2ml}}$ c) $\sqrt{\frac{2F}{ml}}$ d) $\sqrt{\frac{F}{4ml}}$

Ans: (a)

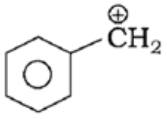
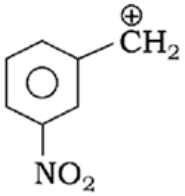
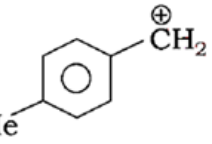
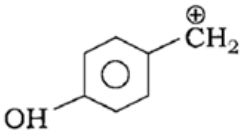
CHEMISTRY

1. 3 M of NaCl whose density is 1.25 g/ml. Find its Molality.

   a) 3.86 mol/Kg b) 2.79 mol/Kg c) 1.97 mol/Kg d) 0.786 mol/Kg

   Ans: (b)

2. The most stabled carbocation is

   a) 
   b) 
   c) 
   d) 

   Ans: (d)

3. The sum of number of 4d-electrons in Ru and Nb

   a) 11 b) 13 c) 17 d) 7

   Ans: (a)

4. Identify the extensive and intensive property?

   a) Mass, volume, conductivity - Intensive property

   b) Mass, temperature, heat, volume - Extensive property

   c) Mass, volume, internal energy - Extensive property

   d) Density, temperature, moles, internal energy – Intensive property

   Ans: (c)

5. Nickel di methyl glyoxime complex has how many Hydrogen bondings

   a) 4 b) 6 c) 2 d) 8

   Ans: (c)

6. 200 ml of 0.2 M solution of NaOH and 400 ml of 0.5 M of NaOH solution are mixed together. Find the Molarity of mixture

   a) 0.3 b) 0.15 c) 0.9 d) 0.4

   Ans: (d)

7. Which of the following has two secondary Hydrogens

   a) 4 -ethyl-2,2-dimethyl hexane b) 2,2,3,3-tetramethyl pentane

   c) 2,2,4,4-tetramethyl heptane d) None of these

   Ans: (b)

8. Which of the following anion will not undergo disproportionation?

   a) ClO_4^- b) ClO_3^- c) ClO_2^- d) ClO^-

   Ans: (a)

9. Given below are two statements

S-I: Lassaigne test is used for detection of Nitrogen, phosphorous, sulphur and Halogens.

S-II: Lassaigne extract is made with magnesium metal.

a) Both S-I and S-II are correct
b) Both S-I and S-II are incorrect
c) S-I is correct but S-II is incorrect
d) S-I is incorrect but S-II is correct

Ans: (c)

10. Compare dipole moment of

(I) NF_3 (II) $CHCl_3$ (III) H_2S (IV) HBr

a) I > II > III > IV b) II > III > I > IV c) II > III > IV > I d) III > I > IV > II

Ans: (c)

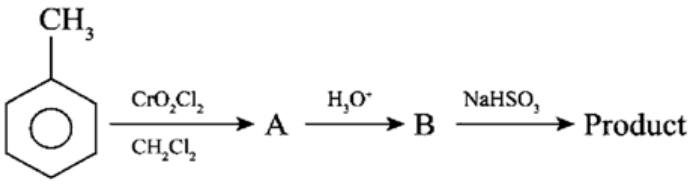
11. Arrange according to CFSE.

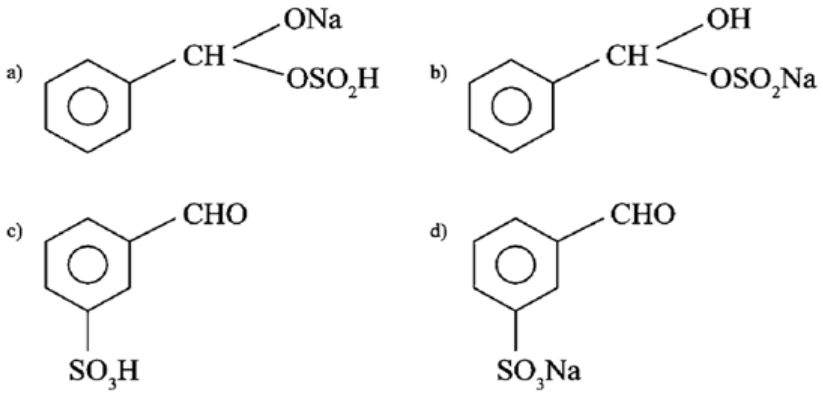
(i) $[Co(NH_3)_4]^{2+}$ (ii) $[Co(NH_3)_6]^{3+}$ (iii) $[Co(NH_3)_6]^{2+}$ (iv) $[Co(en)_3]^{3+}$

a) (iv) > (ii) > (iii) > (i)
b) (iv) > (iii) > (ii) > (i)
c) (i) > (iii) > (ii) > (iv)
d) (i) > (ii) > (iii) > (iv)

Ans: (a)

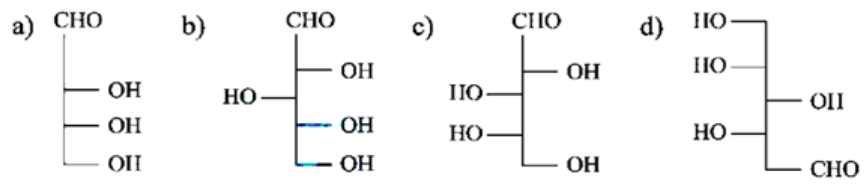
12.





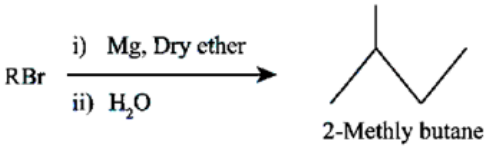
Ans: (b)

13. Identify number of structures which can be correlated to D- glyceraldehyde



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

Ans: (a)

14. 

The maximum number of RBr producing 2-methyl butane by above sequence of reactions is

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

Ans: (d)

15. Among Group-15 elements, what is the maximum covalency of an element having weakest E – E covalent bond (E = element)

a) 4 b) 3 c) 5 d) 2

Ans: (a)

16. **Statement - 1:** In corrosion of metal, the metal acts as cathode.

Statement - 2: Alkaline medium increases rate of corrosion.

a) Both S-I and S-II are correct b) Both S-I and S-II are incorrect

c) S-I is correct but S-II is incorrect d) S-I is incorrect but S-II is correct

Ans: (b)

17.

a) b) c) d)

Ans: ()

MATHEMATICS

1. $\sum_{r=1}^{30} \frac{r^2\left({}^{30}c_r\right)^2}{{}^{30}c_{r-1}} = \alpha \times 2^{29}$, then $\alpha =$

Ans: (930)

2. Let $A = \{1,2,3\}$ then the number of relations on A which consist of ordered pair (1, 2) & (2, 3) and must be reflexive and transitive but not symmetric.

a) 6 b) 8 c) 4 d) 10

Ans: (a)

3. Perpendicular distance from the point P(−2,0,2) to the line $\frac{x+1}{2} = \frac{y-1}{-1} = \frac{z+3}{2}$

a) $2\sqrt{3}$ b) $3\sqrt{2}$ c) $2\sqrt{5}$ d) $3\sqrt{7}$

Ans: (b)

4. Find the area between the curves $y = x^2 - 4x + 4$ and $y^2 = 16 - 8x$

a) 2/3 b) 2/5 c) 9/7 d) 8/3

Ans: (d)

5. $x + y + 2z = 6, 2x + 3y + az = a + 1, -x - 3y + bz = 2b$ has infinitely many solutions then $7a + 3b =$

a) 18 b) 16 c) 11 d) 21

Ans: (b)

6. The total number of terms in A.P are $2k$. The sum of odd terms is 40 and the sum of even terms is 55 and last term of the A.P exceeds the first term by 27. Then find the value of k.

a) 9 b) 3 c) 5 d) 7

Ans: (c)

7. There are 3 girls and 4 boys. Number of ways of arrangement if all girls stand together and all boys stand together in a line such that boys B_1 and B_2 from the group are not adjacent.

a) 35 b) 81 c) 64 d) 144

Ans: (d)

8. Let α, β, γ and δ be the coefficient of x^7, x^5, x^3 and x respectively in the expansion of $\left(x + \sqrt{x^3 - 1}\right)^5 + \left(x - \sqrt{x^3 - 1}\right)^5, x > 1$. If u and v satisfy the equations $\alpha u + \beta v = 18, \gamma u + \delta v = 20$ then u + v equals

a) 4 b) 5 c) 6 d) 3

Ans: (b)

9. If A and B are two events such that $p(A \cap B) = 0.1, P(A/B)$ and $P(B/A)$ are the roots of the equation $12x^2 - 7x + 1 = 0$ then the value of $\frac{P(\bar{A} \cup \bar{B})}{P(\bar{A} \cap \bar{B})}$ is

a) 9/4 b) 7/4 c) 5/3 d) 4/3

Ans: (a)

10. $\int e^x \left(\frac{x\sin^{-1} x}{\sqrt{1-x^2}} + \frac{\sin^{-1} x}{(1-x^2)^{3/2}} + \frac{x}{1-x^2}\right) dx = g(x) + c$, where c is the constant of the integration then $g(1/2)$ equals

a) $\frac{\pi}{4}\sqrt{\frac{e}{2}}$ b) $\frac{\pi}{6}\sqrt{\frac{e}{3}}$ c) $\frac{\pi}{6}\sqrt{\frac{e}{2}}$ d) $\frac{\pi}{4}\sqrt{\frac{e}{3}}$

Ans: (b)

11. Let $f(x) = \int_0^{x^2} \frac{t^2-8t+15}{e^t} dt, x \in R$, the number of local maximum and minimum point of $f(x)$ respectively are

a) 2 and 3 b) 3 and 2 c) 1 and 3 d) 1 and 2

Ans: (a)

12. The sum of all values of $\theta \in [0, 2\pi]$ satisfying $2\sin^2\theta = \cos\theta$, $2\cos^2\theta = 3\sin\theta$ is

a) $\frac{\pi}{2}$ b) $\frac{5\pi}{6}$ c) 4π d) π

Ans: (d)

13. Let $A = \{1, 2, 3, 4\}$ and $B = \{1, 4, 9, 16\}$, then the number of many one function $f: A \to B$ such that $1 \in f(A)$ equal to

a) 139 b) 127 c) 163 d) 151

Ans: (d)