

# JEE-ADVANCE: TEST-03

## TEST SERIES

PAPER-I

Time : 3 hrs.

M.M.: 180

TEST CODE - A

TOPIC COVERED :

PHYSICS: Complete XI and XII Syllabus

CHEMISTRY: Complete XI and XII Syllabus

MATHEMATICS: Complete XI and XII Syllabus

**ATTENTION:** *Kindly ask for the Roll No. from the invigilator to fill in OMR SHEET. Mark the Roll No. & Test code on the answer sheet properly. (No other sheet will be issued)*

**GENERAL INSTRUCTIONS :**

1. The Test Paper consists of **60** questions
2. There are **Three Subjects (Physics, Chemistry & Mathematics)** in the question paper.
3. **This paper is divided into 3 parts: Physics Section (I), (II) and (III); Chemistry Section (I), (II) and (III) & Mathematics Section (I), (II) and (III).**
  - **Single Choice: Physics Section (I) (1 to 10) Chemistry Section I (16 to 25) and Mathematics Section I (31 to 40), 2 marks for each correct answer and no negative marking for incorrect answer.**
  - **Multiple correct answer type questions : Physics Section (II) (11 to 15) Chemistry Section II (26 to 30) and Mathematics Section II (41 to 45), 4 marks for each correct answer and -1 mark for incorrect answer.**
  - **Integer Type: Physics Section-III (1 to 5); Chemistry Section-III (6 to 10) and Mathematics Section- III (11 to 15), for each question you will be awarded 4 marks if you darken the bubble corresponding to the correct answer and zero mark if no bubbles are darkened. In all other cases, minus one (-1) mark will be awarded.**

Name of the Student : \_\_\_\_\_

Section : \_\_\_\_\_

Centre : \_\_\_\_\_

Invigilator's Signature : \_\_\_\_\_

# PHYSICS

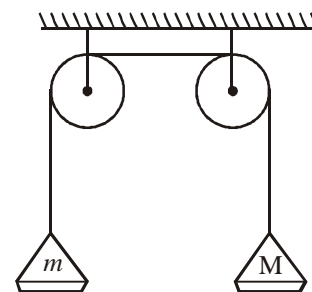
## SECTION- I: STRAIGHT OBJECTIVE TYPE

This section contains 10 multiple choice questions numbered 1 to 10. Each question has 4 choice (A), (B), (C) and (D), out of which ONLY-ONE is correct

1. The distance travelled by a particle in a straight line motion is directly proportional to  $t^{1/2}$ , where  $t$  = time elapsed. What is the nature of motion?
  - (a) Increasing acceleration
  - (b) Decreasing acceleration
  - (c) Increasing retardation
  - (d) Decreasing retardation
  
2. A particle of mass  $m_1$  moving with velocity  $v$  in a positive direction collides elastically with a mass  $m_2$  moving in opposite direction also at velocity  $v$ . If  $m_2 \gg m_1$ , then
  - (a) the velocity of  $m_1$  immediately after collision is nearly  $3v$
  - (b) the change in momentum of  $m_1$  is nearly  $4m_1v$
  - (c) the change in kinetic energy of  $m_1$  is nearly  $4mv_2$
  - (d) all of these

3. Each pulley shown in the given figure below has radius  $r$  and moment of inertia  $I$ . The acceleration of the block is

- |  |  |
|--|--|
| (a) $\frac{(M - m)g}{\left(M + m + \frac{2I}{r^2}\right)}$ | (b) $\frac{(M - m)g}{\left(M + m - \frac{2I}{r^2}\right)}$ |
| (c) $\frac{(M - m)g}{\left(M + m + \frac{I}{r^2}\right)}$  | (d) $\frac{(M - m)g}{\left(M + m - \frac{I}{r^2}\right)}$  |



4. Two bodies with masses  $M_1$  and  $M_2$  are initially at rest and a distance  $R$  apart. Then they move directly towards one another under the influence of their mutual gravitational attraction. What is the ratio of the distances travelled by  $M_1$  to the distance travelled by  $M_2$ ?
 

(a) $\frac{M_1}{M_2}$	(b) $\frac{M_2}{M_1}$	(c) 1	(d) $\frac{1}{2}$
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5. A body of density  $d$  and volume  $V$  floats with volume  $V_1$  of its total volume  $V$  immersed in a liquid of density  $d_1$  and the rest of the volume  $V_2$  immersed in another liquid of density  $d_2 (< d_1)$ . The volume  $V_1$  immersed in liquid of density  $d_1$  is

(a)  $\left(\frac{d-d_2}{d_1-d_2}\right)V$       (b)  $\left(\frac{d+d_2}{d_1+d_2}\right)V$       (c)  $\left(\frac{d_1-d_2}{d_1}\right)V$       (d)  $\frac{d_1}{d_2}V$

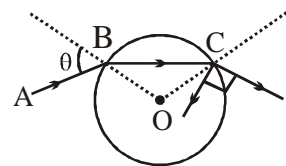
6. A solid whose volume does not change with temperature floats in a liquid. For two different temperatures  $t_1$  and  $t_2$  of the liquid, fractions  $f_1$  and  $f_2$  of the volume of the solid remain submerged in the liquid. The coefficient of volume expansion of the liquid is equal to

(a)  $\frac{f_1-f_2}{f_2t_1-f_1t_2}$       (b)  $\frac{f_1-f_2}{f_1t_1-f_2t_2}$       (c)  $\frac{f_1+f_2}{f_2t_1+f_1t_2}$       (d)  $\frac{f_1+f_2}{f_1t_1+f_2t_2}$

7. A uniform solid brass sphere is rotating with angular speed  $\omega_0$  about a diameter. If its temperature is now increased by  $100^\circ\text{C}$ . What will be its new angular speed. (Given  $\alpha_B = 2.0 \times 10^{-5}$  per  $^\circ\text{C}$ )

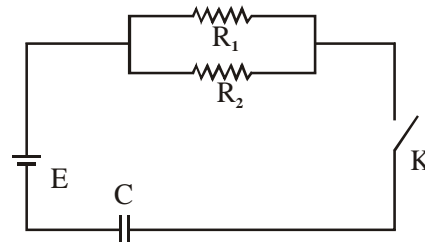
(a)  $11\omega_0$       (b)  $1.01\omega_0$       (c)  $0.996\omega_0$       (d)  $0.824\omega_0$

8. A ray incident at a point B at an angle of incidence  $\theta$  centres into a glass sphere and is reflected and refracted at the farther surface of the sphere, as shown in figure. The angle between the reflected and refracted rays at this surface is  $90^\circ$ . If refractive index of material of sphere is  $\sqrt{3}$ , the value of  $\theta$  is



(a)  $\pi/3$       (b)  $\pi/4$       (c)  $\pi/6$       (d)  $\pi/12$

9. In the circuit shown in fig. The capacitor of capacitance  $C = 2\mu\text{F}$  is uncharged when the key  $k$  is open. The key is then closed for a time interval during which the capacitor becomes charged to a voltage of 2 V. The amount of heat liberated during this time in the resistor of resistance  $R_2 = 3\Omega$  if the emf of the source is  $E = 6\text{V}$ . neglect internal resistance of battery. The resistance  $R_1 = 7\Omega$ .



(a)  $7\mu\text{J}$       (b)  $14\mu\text{J}$       (c)  $21\mu\text{J}$       (d)  $28\mu\text{J}$

10. An ideal monoatomic gas undergoes a process in which its internal energy  $U$  and density  $\rho$  vary as  $U\rho = \text{constant}$ . The ratio of change in internal energy and the work done by the gas is

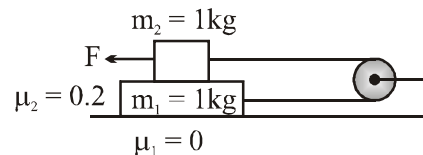
(a)  $\frac{3}{2}$       (b)  $\frac{2}{3}$       (c)  $\frac{1}{3}$       (d)  $\frac{3}{5}$

**SECTION- II: MULTIPLE CORRECT ANSWERS TYPE**

This section contains 5 multiple choice questions numbered 11 to 15. Each question has 4 choice (A), (B), (C) and (D), out of which ONE OR MORE is/are correct

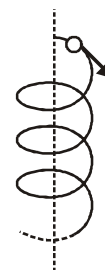
11. A force  $F$  is applied on the upper block which is connected to lower block with the help of a frictionless pulley and massless string

- (a) The system will remain in equilibrium if  $F < 4N$
- (b) If  $F > 4N$  the tension in the string will be  $4N$
- (c) If  $F > 4N$  the frictional force between the blocks will be  $2N$
- (d) If  $F = 6N$  the tension in the string will be  $3N$



12. A very long uniform helix is made of thin metal wire. The axis of helix is vertical. A small bead begins to slide down the fixed helix starting from rest. Considering friction between bead and wire of helix to be non zero, which of the following statements is/are true as long as bead moves on helix.

- (a) The speed of bead keeps on increasing
- (b) The magnitude of frictional force on bead remains constant
- (c) The speed of bead first increases and then remains constant
- (d) The magnitude of frictional force increases and then remains constant.



13. An electron (mass =  $m_e$ ) and a proton (mass =  $m_p$ ) initially at rest move through a certain distance in a uniform electric field in times  $t_1$  and  $t_2$ . Neglect the effect of gravity. Then, field in time  $t_1$  and  $t_2$ . Neglect the effect of gravity. Then,

- (a) the acceleration of electron is much greater than that of proton
- (b) the acceleration of proton is much greater than that of electron

(c)  $\frac{t_1}{t_2} = \left(\frac{m_e}{m_p}\right)^{1/2}$                       (d)  $\frac{t_1}{t_2} = \left(\frac{m_p}{m_e}\right)^{1/2}$

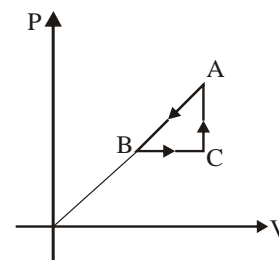
14. A flywheel (which has almost all its mass concentrated on its circumference) of mass  $100\text{ kg}$  and diameter  $2\text{ m}$  is rotating at the rate of  $\frac{300}{\pi}$  rev/min. Then

- (a) The kinetic energy of rotation of the flywheel is  $5\text{ kJ}$
- (b) The angular momentum associated with the fly when is  $100\text{ kg m}^2\text{ s}^{-1}$
- (c) The moment of inertia of flywheel is  $100\text{ kg m}^2$
- (d) none of these

15. P-V diagram of a cyclic process ABCA is as shown in the figure.

Choose the correct statement(s)

- (a)  $\Delta Q_{A \rightarrow B}$  = negative
- (b)  $\Delta U_{B \rightarrow C}$  = positive
- (c)  $\Delta U_{C \rightarrow A}$  = negative
- (d)  $\Delta W_{CAB}$  = negative



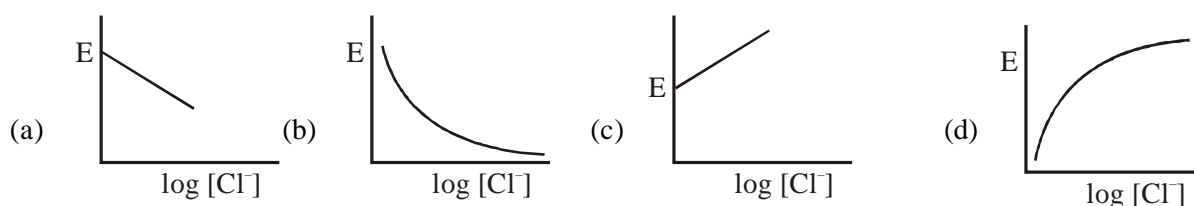
**SECTION- I: STRAIGHT OBJECTIVE TYPE**

**This section contains 10 multiple choice questions numbered 16 to 25. Each question has 4 choice (A), (B), (C) and (D), out of which ONLY-ONE is correct**

16. One molal solution of a complex of cobalt chloride with  $\text{NH}_3$  in water showed an elevation in boiling point equal to  $2.08^\circ$ . Assuming that the complex is completely ionized in the solution, the complex is ( $K_b$  for water =  $0.52 \text{ K kg mol}^{-1}$ )

- (a)  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$     (b)  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$     (c)  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$     (d) None of these

17. For the calomel electrode,  $\text{Hg}, \text{Hg}_2\text{Cl}_2 | \text{Cl}^-(\text{aq})$ , electrode potentials measured at different  $\text{Cl}^-$  ion concentration are plotted against  $\log [\text{Cl}^-]$ . The variation is correctly represented by the plot



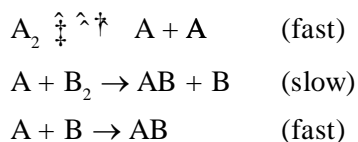
18. The emf of the cell



at 298 K is 0.2905 volt. Then the value of equilibrium constant for the cell reaction is

- (a)  $\frac{0.32}{e^{0.0295}}$     (b)  $\frac{0.32}{10^{0.0295}}$     (c)  $\frac{0.26}{10^{0.0295}}$     (d)  $\frac{0.32}{10^{0.0591}}$

19. A hypothetical reaction,  $\text{A}_2 + \text{B}_2 \rightarrow 2\text{AB}$ , follows the mechanism as given below:



The overall order of reaction is

- (a) zero    (b) 1    (c)  $1\frac{1}{2}$     (d) 2

20. Under the same reaction conditions, initial concentration of  $1.386 \text{ mol dm}^{-3}$  of a substance becomes half in 40 seconds and 20 seconds through first order and zero order kinetics respectively. Ratio ( $k_1/k_0$ ) of the rate constants for first order ( $k_1$ ) and zero order ( $k_0$ ) of the reactions is

- (a)  $0.5 \text{ mol}^{-1} \text{ dm}^3$     (b)  $1.0 \text{ mol dm}^{-3}$     (c)  $1.5 \text{ mol dm}^{-3}$     (d)  $2.0 \text{ mol}^{-1} \text{ dm}^3$

21. According to Freundlich adsorption isotherm, which of the following is correct?

- (a)  $\frac{x}{m} \propto p^0$     (b)  $\frac{x}{m} \propto p^1$   
 (c)  $\frac{x}{m} \propto p^{1/n}$     (d) all the above are correct for different ranges of pressure

22. Among the following, surface tant that will form micelles in aqueous solution at the lowest molar concentration at ambient conditions is
- (a)  $(\text{CH}_3)(\text{CH}_2)_{15}\text{N}^+(\text{CH}_3)_3\text{Br}^-$  (b)  $\text{CH}_3(\text{CH}_2)_{11}\text{OSO}_3^-\text{Na}^+$   
 (c)  $\text{CH}_3(\text{CH}_2)_6\text{COO}^-\text{Na}^+$  (d)  $\text{CH}_3(\text{CH}_2)_{11}\text{N}^+(\text{CH}_3)_3\text{Br}^-$
23. Which method of purification is represented by the following equation?
- $$\text{Ti(s)} + 2\text{I}_2(\text{g}) \xrightarrow{523\text{K}} \text{TiI}_4(\text{g}) \xrightarrow[\text{Ti(s)}+2\text{I}_2(\text{g})]{1700\text{K}}$$
- (a) Cupellation (b) Poling (c) Van arkel (d) Zone refining
24. Bleaching powder contains a salt of an oxoacid as one of its components. The anhydride of that oxoacid is
- (a)  $\text{Cl}_2\text{O}$  (b)  $\text{Cl}_2\text{O}_7$  (c)  $\text{ClO}_2$  (d)  $\text{Cl}_2\text{O}_6$
25. When  $\text{Cl}_2$  gas reacts with hot and concentrated sodium hydroxide solution, the oxidation number of chlorine changes from
- (a) zero to +1 and zero to +5 (b) zero to -1 and zero to +5  
 (c) zero to -1 and zero to +3 (d) zero to +1 and zero to -3

### SECTION- II: MULTIPLE CORRECT ANSWERS TYPE

**This section contains 5 multiple choice questions numbered 26 to 30. Each question has 4 choice (A), (B), (C) and (D), out of which ONE OR MORE is/are correct**

26. Which of the following can act as bidentate ligands?
- (a) oxalate (b) carbonate (c) sulphate (d) nitrate
27. Which of the following statements are correct when a mixture of  $\text{NaCl}$  and  $\text{K}_2\text{Cr}_2\text{O}_7$  is gently warmed with conc.  $\text{H}_2\text{SO}_4$ ?
- (a) a deep red vapour is evolved  
 (b) The vapour when passed into  $\text{NaOH}$  solution gives yellow solution of  $\text{Na}_2\text{CrO}_4$   
 (c) chlorine gas is evolved  
 (d) chromyl chloride is formed
28.  $\text{HI}$  cannot be prepared by the action of conc.  $\text{H}_2\text{SO}_4$  on  $\text{KI}$  because
- (a)  $\text{HI}$  is stronger acid than  $\text{H}_2\text{SO}_4$  (b)  $\text{H}_2\text{SO}_4$  is an oxidising agent  
 (c)  $\text{H}_2\text{SO}_4$  is stronger than  $\text{HI}$  (d)  $\text{HI}$  is a strong reducing agent
29.  $\text{SO}_2$  acts as a/an
- (a) Bleaching agent (b) Oxidising agent (c) Reducing agent (d) Disinfectant
30. Extraction of metal from the one cassiterite involves
- (a) carbon reduction of an oxide ore (b) self-reduction of a sulphide ore  
 (c) removal of copper impurity (d) Removal of iron impurity

**SECTION- I: STRAIGHT OBJECTIVE TYPE**

This section contains 10 multiple choice questions numbered 31 to 40. Each question has 4 choice (A), (B), (C) and (D), out of which ONLY-ONE is correct

31. If  $\alpha, \beta, \gamma$  are the roots of the equation  $x^3 + mx^2 + 3x + m = 0$ , then the general value of  $\tan^{-1}\alpha + \tan^{-1}\beta + \tan^{-1}\gamma$  is
- (a)  $\frac{(2n+1)\pi}{2}$                       (b)  $n\pi$                       (c)  $\frac{n\pi}{2}$                       (d) none of these
32. Let  $f(x) = a_0 + a_1|x| + a_2|x|^2 + a_3|x|^3$  where  $a_0, a_1, a_2, a_3$  are constants. Then only one of the following statements is correct. Which one is it?
- (a)  $f(x)$  is differentiable whatever be  $a_0, a_1, a_2, a_3$   
 (b)  $f(x)$  is not differentiable whatever be  $a_0, a_1, a_2, a_3$   
 (c)  $f(x)$  is not differentiable, then  $a_1 \neq 0$   
 (d)  $f(x)$  is not differentiable, then  $a_1 = 0, a_3 \neq 0$
33. Two of the straight lines given by  $3x^3 + 3x^2y - 3xy^2 + dy^3 = 0$  are at right angles if
- (a)  $d = -1/3$                       (b)  $d = 1/3$                       (c)  $d = -3$                       (d)  $d = 3$
34. The equation  $|z + i| - |z - i| = k$  represents a hyperbola if
- (a)  $-2 < k < 2$                       (b)  $k > 2$                       (c)  $0 < k < 2$                       (d) none of these
35. If  $px^2 + qx + r = 0$  has no real roots and  $p, q, r$  are real such that  $p + r > 0$  then
- (a)  $p + r < q$                       (b)  $p + r > q$                       (c)  $q > 0$                       (d) none of these
36. If the circle  $x^2 + y^2 = a^2$  intersects the hyperbola  $xy = c^2$  in four points  $P(x_1, y_1), Q(x_2, y_2), R(x_3, y_3), S(x_4, y_4)$ , then
- (a)  $x_1 + x_2 + x_3 + x_4 = 0$     (b)  $y_1 + y_2 + y_3 + y_4 = 0$     (c)  $x_1 x_2 x_3 x_4 = c^4$                       (d) all of these
37. If  $|z_1| = |z_2| = |z_3|$ , then orthocentre of triangle formed by  $z_1, z_2, z_3$  is
- (a) origin                      (b)  $\frac{z_1 + z_2 + z_3}{3}$                       (c)  $z_1 + z_2 + z_3$                       (d)  $\frac{z_1 z_2 + z_2 z_3 + z_3 z_1}{3}$
38. If all the roots of  $z^3 + az^2 + bz + c = 0$  are of unit modulus, then
- (a)  $|a| \leq 3$                       (b)  $|b| \leq 3$                       (c)  $|c| = 1$                       (d) all of these
39.  $\sum_{n_1=0}^n \sum_{n_2=0}^{n_1} \dots \sum_{n_{k-2}=0}^{n_{k-3}} \sum_{n_{k-1}=0}^{n_{k-2}} \sum_{n_k=0}^{n_{k-1}} {}^n C_{n_k} {}^{n-n_k} C_{n_{k-1}-n_k} {}^{n-n_{k-1}} C_{n_{k-2}-n_{k-1}} {}^{n-n_{k-2}} C_{n_{k-3}-n_{k-2}} \dots {}^{n-n_2} C_{n_1-n_2}$  is equal to
- (a)  $(k-1)^n$                       (b)  $k^n$                       (c)  $(k+1)^n$                       (d)  $k^{n+1}$

40.  $P$  is any point on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  whose foci are  $S$  and  $S'$ . Let  $\angle PSS' = \alpha$  and  $\angle PS'S = \beta$ , then which of the following is/are true

- (a)  $\tan \frac{\alpha}{2} \tan \frac{\beta}{2} = \frac{\sqrt{a^2 - b^2}}{b^2} (a - \sqrt{a^2 - b^2})$       (b)  $\tan \frac{\alpha}{2} \tan \frac{\beta}{2} = \frac{1 - e}{1 + e}$   
(c)  $\tan \frac{\alpha}{2} \tan \frac{\beta}{2} = \frac{1 + e}{1 - e}$       (d) none of these

**SECTION- II: MULTIPLE CORRECT ANSWERS TYPE**

This section contains 5 multiple choice questions numbered 41 to 45. Each question has 4 choice (A), (B), (C) and (D), out of which ONE OR MORE is/are correct

41. The number of ways of choosing triplets  $(x, y, z)$  such that  $x \geq \max \{x, y\}$  and  $x, y, z \in \{1, 2, \dots, n, n + 1\}$  is

- (a)  ${}^{n+1}C_3 + {}^{n+2}C_3$       (b)  $\frac{1}{6}n(n+1)(2n+1)$       (c)  $1^2 + 2^2 + \dots + n^2$       (d)  $2({}^{n+2}C_3) - {}^{n+1}C_2$

42. The number of triangles that can be formed with the sides of lengths  $a, b$  and  $c$  where  $a, b, c$  are integers such that  $a \leq b \leq c$  is

- (a)  $\frac{1}{4}(c+1)^2$  where  $c$  is odd      (b)  $\frac{1}{2}c(c+1)$  when  $c$  is odd  
(c)  $\frac{1}{4}c(c+2)$  when  $c$  is even      (d)  $\frac{1}{4}c^2$  when  $c$  is even

43. If  $C_r = \binom{n}{r}$  then sum of the series  $S = C_0^2 + \frac{1}{2}C_1^2 + \frac{1}{3}C_2^2 + \dots$  upto  $(n + 1)$  terms is

- (a)  $\frac{1}{n+1} \binom{2n+1}{n+1}$       (b)  $\frac{1}{2(n+1)} \binom{2n+2}{n+1}$       (c)  $\frac{1}{n+1} \binom{2n+1}{n}$       (d)  $\frac{(2n+1)!}{(n+1)!^2}$

44. If  $x = (7 + 4\sqrt{3})^{2n} = [x] + f$ , then  $x(1 - f)$  is equal to

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

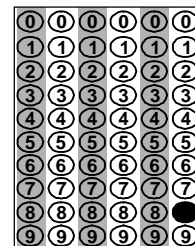
45. If  $n > 2$  then  $C_1(a-1)^2 - C_2(a-2)^2 + C_3(a-3)^2 + \dots + (-1)^{n-1}C_n(a-n)^2$  is equal to

- (a)  $na$       (b)  $a^2$       (c)  $a^2 - 2a$       (d) 0



### SECTION- III: INTEGER ANSWER TYPE

This section contains 15 questions. The answer to each of the question is a single digit integer, ranging from 0 to 9. The bubble corresponding to the correct answer is to be darkened in the ORS. The appropriate bubbles corresponding to the answers to these questions have to be darkened as illustrated in the following example: If answer of question number (1) is 8, then the correct darkening of bubbles will look like the following.



#### PHYSICS

1. An electric current of 2.0 A passes through a wire of resistance  $25\Omega$ . How much heat (in  $\times 10^3\text{J}$ ) will be developed in 1 minute?
2. The magnification of an object placed in front of a convex lens is +2. The focal length of the lens is 2.0 m. Find the distance by which the object has to be moved to obtain a magnification of -2 (in metres).
3. Surface of a thin equi convex glass lens ( $\mu = 1.5$ ) have radius of curvature R. Paraxial rays are incident on it. If the final image is formed at a distance R/13 from the pole of the lens after  $n$  internal reflections, then the value of  $n$  is.
4. Find the recoil speed (approximately in m/sec) when a hydrogen atom emits a photon during the transition from  $n = 5$  to  $n = 1$ .
5. Hydrogen atom in its ground state is excited by means of monochromatic radiation of wavelength  $975 \text{ \AA}$ . How many different lines are possible in the resulting spectrum? Calculate the longest wavelength amongst them. You may assume the ionization energy for hydrogen atom as 13.6 eV.

#### CHEMISTRY

6. How many of the following are thermosetting polymer? Polyester, SBR, bakelite, Polyvinyl acetate, Urea-formaldehyde resin, Melamine-formaldehyde resin, nylon 6, 6 polypropylene, thiokol.
7. How many of the following amines do not evolve  $\text{N}_2$  on treatment with  $\text{NaNH}_2/\text{HCl}$ ?
8. Denticity of ethylenediaminetetraacetate ion is
9. Amongst the following, the number of noble gases which can form interstitial compounds is He, Ne, Ar, Kr, Xe, Rn
10. If potassium ferrocyanide is 75% ionized in the solution, its van't Hoff factor is

## MATHEMATICS

11. In a  $\Delta ABC$ ,  $A = \frac{\pi}{3}$ ,  $b = 10$ ,  $c = 6$ ,  $AD$  is a median through  $A$ , then  $AD$  is equal to
12. If  $L$  intersects the sides  $BC$ ,  $CA$  and  $AB$  of the triangle  $ABC$  at  $P$ ,  $Q$ ,  $R$  respectively then  $\left| \frac{BP}{PC} \times \frac{CQ}{QA} \times \frac{AR}{RB} \right|$  is equal to
13. If the centroid of the triangle  $ABC$  is at the origin and algebraic sum of the lengths of the perpendiculars from the vertices of the triangle  $ABC$  on the line  $L$  is equal to 1 then sum of the squares of the intercepts made by  $L$  on the coordinate axes is equal to
14. Three circles with radii 3 cm, 4 cm and 5 cm touch each other externally. If  $A$  is the point of intersection of tangents to these circles at their points of contact, then the square of distance of  $A$  from the points of contact is
15. The exponent of 7 in  ${}^{100}C_{50}$  is
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# JEE-ADVANCE: TEST-03

## TEST SERIES

**PAPER-I**

**Time : 3 hrs.**

**M.M.: 180**

**TEST CODE - A**

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### ANSWERS

#### Physics: Section I to II

- |           |             |             |         |             |           |
|-----------|-------------|-------------|---------|-------------|-----------|
| 1. (d)    | 2. (d)      | 3. (a)      | 4. (b)  | 5. (a)      | 6. (a)    |
| 7. (c)    | 8. (a)      | 9. (b)      | 10. (a) | 11. (a,c,d) | 12. (c,d) |
| 13. (a,c) | 14. (a,b,c) | 15. (a,b,d) |         |             |           |

#### Chemistry: Section I to II

- |             |               |             |         |             |             |
|-------------|---------------|-------------|---------|-------------|-------------|
| 16. (a)     | 17. (c)       | 18. (b)     | 19. (c) | 20. (a)     | 21. (d)     |
| 22. (a)     | 23. (c)       | 24. (a)     | 25. (b) | 26. (a,b,c) | 27. (a,b,d) |
| 28. (a,b,d) | 29. (a,b,c,d) | 30. (a,c,d) |         |             |             |

#### Mathematics: Section I to II

- |               |         |         |         |               |           |
|---------------|---------|---------|---------|---------------|-----------|
| 31. (b)       | 32. (c) | 33. (c) | 34. (a) | 35. (b)       | 36. (d)   |
| 37. (c)       | 38. (d) | 39. (c) | 40. (b) | 41. (a,b,c,d) | 42. (a,c) |
| 43. (a,b,c,d) | 44. (a) | 45. (b) |         |               |           |

#### Section-III (PCM)

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (6)  | 2. (2)  | 3. (4)  | 4. (4)  | 5. (4)  | 6. (3)  |
| 7. (0)  | 8. (6)  | 9. (1)  | 10. (4) | 11. (7) | 12. (1) |
| 13. (9) | 14. (5) | 15. (0) |         |         |         |