

JEE-ADVANCE: TEST-11

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 : _____

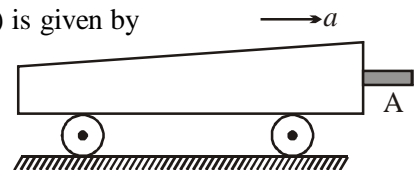
PHYSICS

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. A projectile is projected with initial velocity $(6\hat{i} + 8\hat{j})$ m/s. If $g = 10 \text{ ms}^{-2}$, then horizontal range is
 (a) 4.8 m (b) 9.6 m (c) 19.2 m (d) 14.0 m

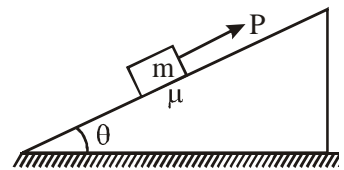
2. The minimum acceleration that must be imparted to the cart in the figure so that the block A will not fall (given $\mu = 0.5$ is the coefficient of friction between the surfaces of block and cart) is given by
 (a) 2 m/s^2 (b) 20 m/s^2
 (c) 5 m/s^2 (d) 7.5 m/s^2



3. A particle of mass m moves with a variable velocity v , which changes with distance covered x along a straight line as $v = k\sqrt{x}$ where k is a positive constant. The work done by all the forces acting on the particle, during the first t seconds is
 (a) $\frac{mk^4}{t^2}$ (b) $\frac{mk^4 t^2}{4}$ (c) $\frac{mk^4 t^2}{8}$ (d) $\frac{mk^4 t^2}{16}$

4. A block of mass m is being pulled up the rough incline by an agent delivering constant power P . The coefficient of friction between the block and the incline is μ . The maximum speed of the block during the course of ascent is

- (a) $v = \frac{P}{mg \sin \theta + \mu mg \cos \theta}$ (b) $v = \frac{P}{mg \sin \theta - \mu mg \cos \theta}$
 (c) $v = \frac{2P}{mg \sin \theta - \mu mg \cos \theta}$ (d) $v = \frac{3P}{mg \sin \theta - \mu mg \cos \theta}$



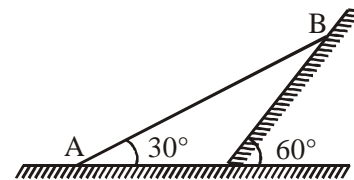
5. A pendulum consists of a wooden bob of mass m and of length l . A bullet of mass m_1 is fired towards the pendulum with a speed v_1 . The bullet emerges out of the bob with a speed $v_1/3$ and the bob just completes motion along a vertical circle. Then v_1 is
 (a) $\left(\frac{m}{m_1}\right)\sqrt{5gl}$ (b) $\frac{3}{2}\left(\frac{m}{m_1}\right)\sqrt{5gl}$ (c) $\frac{2}{3}\left(\frac{m}{m_1}\right)\sqrt{5gl}$ (d) $\left(\frac{m_1}{m}\right)\sqrt{gl}$

6. A stationary body explodes into fragments of masses m_1 and m_2 . If momentum of one fragment is p , the energy of explosion is

(a) $\frac{p^2}{2(m_1 + m_2)}$ (b) $\frac{p^2}{2\sqrt{m_1 m_2}}$ (c) $\frac{p^2(m_1 + m_2)}{2m_1 m_2}$ (d) $\frac{p^2}{2(m_1 - m_2)}$

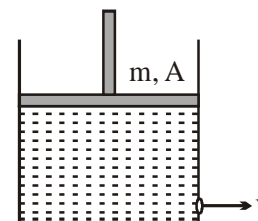
7. In the figure shown, the instantaneous speed of end A of the rod is v to the left. The angular velocity of the rod of length L , must be

(a) $\frac{v}{2L}$ (b) $\frac{v}{L}$
 (c) $\frac{v\sqrt{3}}{2L}$ (d) none of these



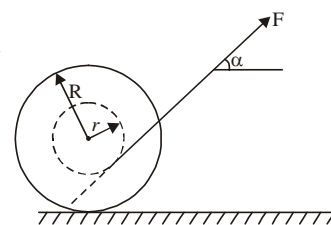
8. A cylindrical vessel contains a liquid of density ρ upto height h . The liquid is closed by a piston of mass m and area of cross section A . There is a small hole at the bottom of the vessel. The speed v with which the liquid comes out of the hole is

(a) $\sqrt{2gh}$ (b) $\sqrt{2\left(gh + \frac{mg}{\rho A}\right)}$ (c) $\sqrt{2\left(gh + \frac{mg}{A}\right)}$ (d) $\sqrt{2gh + \frac{mg}{A}}$



9. Inner and outer radii of a spool are r and R respectively. A thread is wound over its inner surface and placed over a rough horizontal surface. Thread is pulled by a force F as shown in figure. Then in case of pure rolling:

- (a) Thread unwinds, spool rotates anti-clockwise and friction acts leftwards.
 (b) Thread winds, spool rotates clockwise and friction acts leftwards.
 (c) Thread winds, spool moves to the right and friction acts rightwards.
 (d) Thread winds, spool moves to the right and friction does not come into existence



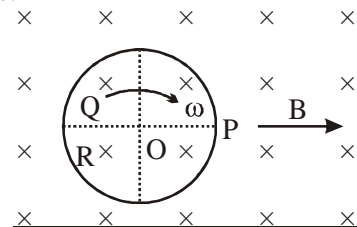
10. When a monochromatic point source of light is at a distance of 0.2 m from a photoelectric cell, the cut-off voltage and saturation current are respectively 0.6 volt and 18.0 mA. If the same source is placed 0.6 m away from the photoelectric cell, then

- (a) the stopping potential will be 0.2 volt (b) the stopping potential will be 0.4 volt
 (c) the saturation current will be 6.0 mA (d) the saturation current will be 2.0 mA

SECTION- II: MULTIPLE CORRECT ANSWERS TYPE

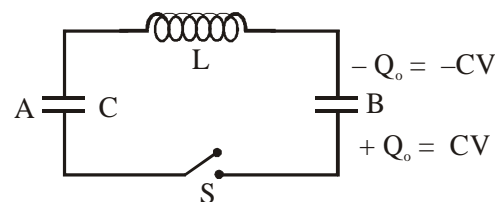
This section contains 5 multiple choice questions numbered 11 to 15. Each question has 4 choice (A), (B), (C) and (D), out of which ONE OR MORE is/are correct

11. A disc of radius R is rolling without sliding on a horizontal surface with a velocity of centre of mass v and angular velocity ω in a uniform magnetic field B which is perpendicular to the plane of the disc as shown in figure. O is the centre of the disc and P, Q, R and S are the four points on the disc.



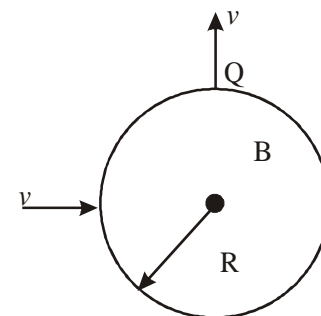
- (a) Due to translation, induced emf across $PS = Bvr$
 (b) Due to rotation, induced emf across $QS = 0$
 (c) Due to translation, induced emf across $RO = 0$
 (d) Due to rotation, induced emf across $OQ = Bvr$

12. An inductor and two capacitors are connected in the circuit as shown in figure. initially capacitor A has no charge and capacitor B has CV charge. Assume that the circuit has no resistance at all. At $t = 0$, switch S is closed, then [given $LC = \frac{2}{\pi^2 \times 10^4} \text{ s}^2$ and $CV = 100 \text{ mC}$]



- (a) when current in the circuit is maximum, charge on each capacitor is same
 (b) when current in the circuit is maximum, charge on capacitor A is twice the charge on capacitor B
 (c) $q = 10 (1 + \cos 100 \pi t) \text{ mC}$, where q is the charge on capacitor B at time t
 (d) $q = 20 (1 - \cos 100 \pi t) \text{ mC}$, where q is the charge on capacitor B at time t

13. A particle of charge q and mass m enters normally (at point P) in a region of magnetic field with speed v . It comes out normally from Q after time T as shown in figure. The magnetic field B is present only in the region of radius R and is uniform. Initial and final velocities are along radial direction and they are perpendicular to each other. For this to happen, which of the following expression (s) is/are correct?



- (a) $B = \frac{mv}{qR}$ (b) $T = \frac{\pi R}{2v}$ (c) $T = \frac{\pi m}{2qB}$ (d) none of these

14. A battery of emf 2V and internal resistance 1Ω is connected across terminals A and B of the circuit shown in the figure

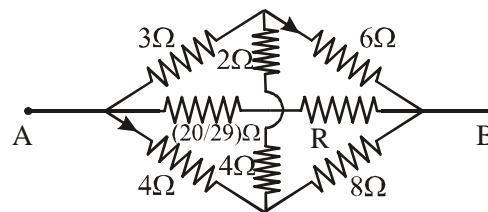
(a) Thermal power generated in the external

circuit will be maximum possible when $R = \frac{16}{25}\Omega$

(b) Maximum possible thermal power generated in external circuit is equal to 4W

(c) Ratio of current through 3Ω to that through 8Ω is independent of R

(d) None of these



15. A dipole is placed in $x-y$ plane parallel to the line $y = 2x$. There exists a uniform electric field along z -axis. Net force acting on the dipole will be zero. But it can experience some torque. We can show that the direction of this torque will be parallel to the line

(a) $y = 2x + 1$

(b) $y = -2x$

(c) $y = -\frac{1}{2}x$

(d) $y = -\frac{1}{2}x + 2$

CHEMISTRY

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. Which of the following gives correct order of stability of coordination compound of Cu^{2+} , Ni^{2+} , Co^{2+} , Fe^{2+} and Mn^{2+} .

(a) $\text{Cu}^{2+} > \text{Ni}^{2+} > \text{Co}^{2+} > \text{Fe}^{2+} > \text{Mn}^{2+}$

(b) $\text{Mn}^{2+} > \text{Fe}^{2+} > \text{Co}^{2+} > \text{Ni}^{2+} > \text{Cu}^{2+}$

(c) $\text{Ni}^{2+} > \text{Cu}^{2+} > \text{Fe}^{2+} > \text{Co}^{2+} > \text{Mn}^{2+}$

(d) $\text{Fe}^{2+} > \text{Mn}^{2+} > \text{Ni}^{2+} > \text{Co}^{2+} > \text{Cu}^{2+}$

17. On addition of 1 mL of 10% aq. NaCl solution to 10 mL red gold sol in presence of 0.250 g of starch, the colour change from red to blue is just prevented. Starch has the gold number

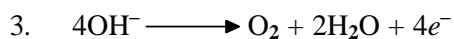
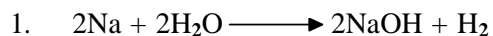
(a) 0.025

(b) 0.25

(c) 250

(d) 2.5

18. Consider the following reactions:



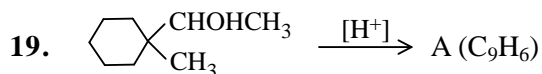
In the diaphragm cell used for the electrolysis of brine, the reactions that occur would include

(a) 1,2 and 4

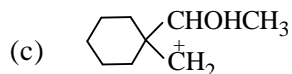
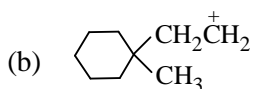
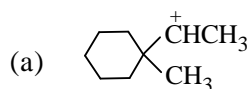
(b) 2,3 and 4

(c) 1,3 and 4

(d) 1,2 and 3

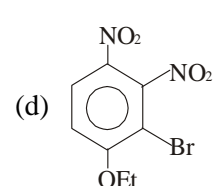
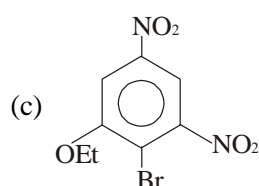
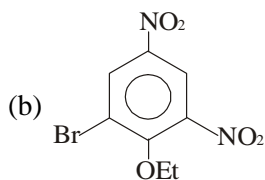
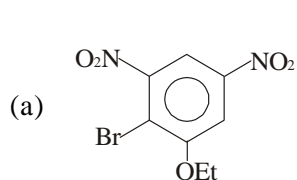
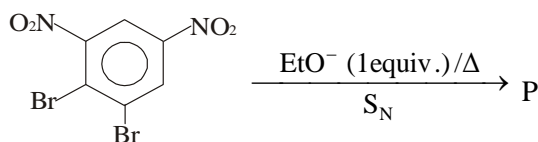


A on ozonolysis gives nonane-2,8-dione. Which of the following intermediates is formed during the reaction?

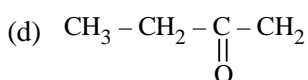
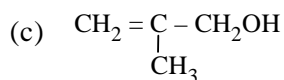
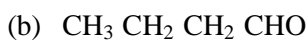
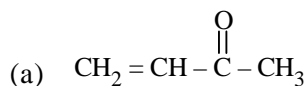


(d) None of these

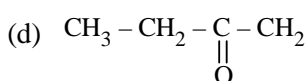
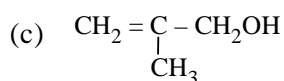
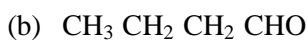
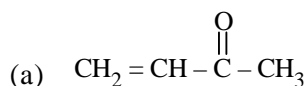
20. In the reaction



21. In the reaction $CH_2 = CH - CHO \xrightarrow[2. H_3O^+]{1. CH_3 Mg Br}$ P. The principal organic product (P) is



22. In the reaction $CH_2 = CH - CHO \xrightarrow[2. H_3O^+]{1. CH_3 Mg Br}$ P. The principal organic product (P) is



23. A solution containing NaHCO_3 and Na_2CO_3 was treated with excess of CaCl_2 solution and filtered. m_1 g of precipitate was obtained. On adding NaOH drop by drop a further m_2 g was precipitated. If after addition of CaCl_2 solution was not filtered but was boiled and filtered, what would have been the total weight of the precipitate.
- (a) $(m_1 + m_2)$ g (b) $\left(m_1 + \frac{m_2}{2}\right)$ g (c) $\frac{m_1 + m_2}{2}$ g (d) $\left(m_2 + \frac{m_1}{2}\right)$ g
24. For a real gas which shows little deviation from ideal behaviour the values of density ρ were measured at different values of pressure P . The plot of P/ρ on the Y-axis versus P on the x-axis was non linear. The intercept on the Y-axis is equal to
- (a) $\frac{RT}{M}$ (b) $\frac{M}{RT}$ (c) RT (d) $\frac{RT}{V}$
25. For the reaction : $\text{A}(g) + \text{B}(g) \rightleftharpoons \text{C}(g)$, the equilibrium partial pressures, $p_A = 0.15$ atm, $p_B = 0.10$ atm and $p_C = 0.30$ atm. When the volume of the reaction vessel was reduced to such an extent that on re-establishing the equilibrium, the partial pressures of A and B were doubled. The new partial pressure of C would be
- (a) 0.30 atm (b) 0.60 atm (c) 1.20 atm (d) 1.80 atm

SECTION- II: MULTIPLE CORRECT ANSWERS TYPE

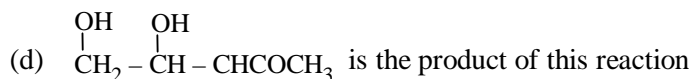
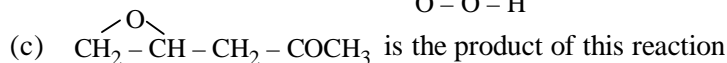
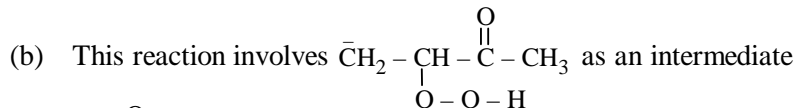
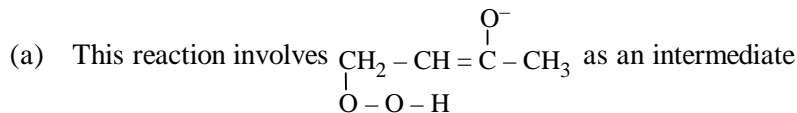
This section contains 5 multiple choice questions numbered 26 to 30. Each question has 4 choice (A), (B), (C) and (D), out of which ONE OR MORE is/are correct

26. Schrodinger wave equation can have many solutions. All of which may not correspond to any physical or chemical reality. Such solutions or wave functions are, therefore not acceptable. The acceptable wave function _____.
- (a) Can be a multivalued function (b) Can be a complex function
(c) Can be discontinues (d) are called as eigen function
27. Which of the following statements is/are correct for Zinc sulphide
- (a) In ZnS unit cell Zn^{+2} ions are present at lattice points and S^{2-} ions occupy tetrahedral voids.
(b) In ZnS unit cell S^{2-} ions are present at lattice points and Zn^{+2} ions occupy tetrahedral voids
(c) In ZnS unit cell Zn ions are present at lattice points and S^{2-} ions occupy octahedral void
(d) None of the above statement is correct.
28. Which of the following statement(s) are correct for binary solution showing negative deviation ?
- (a) When the solution is formed its volume is smaller than the sum of the volumes of their components.
(b) When two liquids are mixed to make solution heat is released.
(c) Such solutions form high boiling azeotrope.
(d) Azeotropic mixture in such solution represents the composition at which vapour pressure is minimum.

29. Which of the following thermodynamic properties can be used to compare stabilities of pent-1-ene, *cis* and *trans* pent-2-ene and 3-methyl-but-1-ene ?
- (a) Heat of hydrogenation (b) Heat of hydroxylation
(c) Heat of halogenation (d) Heat of combustion



Which of the following statements is/are correct for the above reaction ?



MATHEMATICS

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 y, x, z are in A.P., then $2^{x+y}, 2^{y+z}, 2^{x+z}$ are in
(a) A.P. (b) G.P. (c) H.P. (d) none of these
32. If the segment intercepted by the parabola $y^2 = 4ax$ with the line $lx + my + n = 0$ subtends a right angle at the vertex, then
(a) $4al + n = 0$ (b) $4al + 4am + n = 0$ (c) $4am + n = 0$ (d) $al + n = 0$
33. Let z_1 & z_2 be the roots of $z^2 + pz + q = 0$, then the points represented by z_1, z_2 and origin form an equilateral triangle if
(a) $p^2 = 4q$ (b) $p^2 = 3q$ (c) $p^2 = 5q$ (d) none of these
34. If $ab < 1$, then for equation $(2x - a)(2x - b) - 1 = 0$
(a) both roots are positive (b) one root is positive, one is negative
(c) both roots are negative (d) roots are imaginary

35. A line through O meets the lines $2x + y = 1$ and $2x + y = 4$ at the points P & Q , then $OP : PQ$ is
 (a) $1 : 3$ (b) $1 : 4$ (c) $3 : 1$ (d) $4 : 1$
36. PQ and RS are two perpendicular chords of the rectangular hyperbola $xy = c^2$. If O is the centre of the rectangular hyperbola, then the product of the slopes of OP , OQ , OR and OS is equal to
 (a) -1 (b) 1 (c) 2 (d) 4
37. India and Sri Lanka play one day international series until one team wins 4 matches. No match ends in a draw. The number of ways in which India can win the series is
 (a) 35 (b) 70 (c) 40 (d) none of these
38. Let $f(x) = (x^2 - 1)^n (x^2 + x + 1)$. If $f(x)$ has local extremum at $x = 1$, then least value of n is
 (a) 2 (b) 3 (c) 5 (d) 7
39. Let \mathbf{u} , \mathbf{v} , \mathbf{w} be three unit vectors such that $\mathbf{u} + \mathbf{v} + \mathbf{w} = \mathbf{a}$, $\mathbf{a} \cdot \mathbf{u} = \frac{3}{2}$, $\mathbf{a} \cdot \mathbf{v} = \frac{7}{4}$ and $|\mathbf{a}| = 2$, then
 (a) $\mathbf{u} \cdot \mathbf{v} = \frac{1}{4}$ (b) $\mathbf{v} \cdot \mathbf{w} = 1$ (c) $\mathbf{u} \cdot \mathbf{w} = \frac{3}{4}$ (d) none of these
40. If $f(x)$ and $g(x)$ are functions such that $f(x + y) = f(x)g(y) + g(x)f(y)$, then

$$\begin{vmatrix} f(\alpha) & g(\alpha) & f(\alpha + \theta) \\ f(\beta) & g(\beta) & f(\beta + \theta) \\ f(\gamma) & g(\gamma) & f(\gamma + \theta) \end{vmatrix}$$
 is independent of
 (a) α (b) β (c) γ (d) all of $\alpha, \beta, \gamma, \theta$

SECTION- II: MULTIPLE CORRECT ANSWERS TYPE

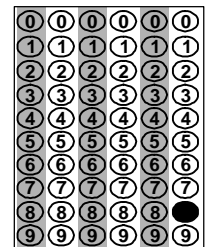
This section contains 5 multiple choice questions numbered 41 to 45. Each question has 4 choice (A), (B), (C) and (D), out of which ONE OR MORE is/are correct

41. If $x = \tan \left[\frac{\pi}{4} + \frac{1}{2} \cos^{-1} \frac{a}{b} \right]$ and $y = \tan \left[\frac{\pi}{4} - \frac{1}{2} \cos^{-1} \frac{a}{b} \right]$, then
 (a) $x + y = 2b/a$ (b) $x + y = 2a/b$ (c) $x - y = \frac{2\sqrt{b^2 - a^2}}{a}$ (d) $x - y = \frac{2\sqrt{a^2 - b^2}}{b}$

42. A $(a, 0)$ and B $(0, b)$ are two points on the x-axis and y-axis respectively. Two circles are drawn passing through the origin and having centre at A and B
- (a) Equation of the common chord is $ax - by = 0$
- (b) Mid-point of the common chord is $\left(\frac{ab^2}{a^2 + b^2}, \frac{a^2b}{a^2 + b^2} \right)$
- (c) AB bisects the common chord
- (d) AB is perpendicular to the common chord
43. Equation of the straight line which meets the circle $x^2 + y^2 = a^2$ at points which are at a distance d from a point $A(\alpha, \beta)$ on the circle is
- (a) $2\alpha x + 2\beta y = 2a^2 - d^2$ (b) $2\alpha x - 2\beta y = 2a^2 + d^2$
- (c) $2\alpha x + 2\beta y = 2a^2 + d^2$ (d) $2\alpha x + 2\beta y + 2a^2 = d^2$
44. Equation of a plane passing through the lines $2x - y + z - 3 = 0$, $3x + y + z - 5 = 0$ and which is at a distance of $1/\sqrt{6}$ from the point $(2, 1, -1)$ is
- (a) $2x - y + z - 3 = 0$ (b) $3x + y + z - 5 = 0$
- (c) $62x + 29y + 19z - 105 = 0$ (d) $x + 2y - 2 = 0$
45. If a plane passes through a fixed point $(2, 3, 4)$ and meets the axes of reference in A, B and C, the point of intersection of the planes through A, B, C parallel to the coordinate planes can be
- (a) $(6, 9, 12)$ (b) $(4, 12, 16)$ (c) $(1, 1, -1)$ (d) $(2, 3, -4)$

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. The electric potential between a proton and an electron is given by $V = V_0 \left(\frac{r}{r_0} \right)$, where V_0 and r_0 are constants are r is the radius of the electron orbit around the proton. Assuming Bohr's model to be applicable, it is found that r is proportional to n^x , where n is the principal quantum number. Find the value of x

2. Hydrogen atom in its ground state is excited by means of monochromatic radiation of wavelength 975\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 .
3. In a nuclear reactor ^{235}U undergoes fission liberating 200 MeV of energy. The reactor has a 10% efficiency and produces 1000 MW power. If the reactor is to function for 10 years, the total mass of uranium required is $x.847 \times 10^4\text{ Kg}$, find x .
4. A ray of light is incident at an angle of 60° on one face of a prism which has an angle of 30° . The ray emerging out of the prism makes an angle of 30° with the incident ray. If the refractive index of the material of the prism is $\mu = \sqrt{a}$, find the value of a .
5. A charged particle enters a magnetic field at right angles to the magnetic field. The field exists for a length to 1.5 times the radius of the circuit path of the plane. The particle will be deviated from its path by $\frac{4\pi}{W}$. Find W .

CHEMISTRY

6. On addition of the 1 ml . solution of 10% NaCl to 10 ml gold sol in the presence of 0.00399 gm of starch, calculate the gold number.
7. 5 ml . of standard gold sol, needs 0.5 mg of gelatin for its protection from coagulation, calculate the gold number of gelatin.
8. An alcoholic solution of dimethylglyoxime is added to an aqueous solution of nickel (II) chloride. Slow addition of ammonium hydroxide led to the precipitation of a bright-red coloured metal complex.
Find out the number of hydrogen bonds present in the structure of the complex.
9. $\text{CrO}_4^{2-} + 2\text{H}^+ + 2\text{H}_2\text{O}_2 \longrightarrow \text{CrO}_5 + 3\text{H}_2\text{O}$
How many peroxide linkages are found in the structure of CrO_5 ?
 $\text{CrO}_4^{2-} + 2\text{H}^+ + 2\text{H}_2\text{O}_2 \longrightarrow \text{CrO}_5 + 3\text{H}_2\text{O}$
10. How many of these are copolymers?
PVC, SBR, Nylon-6, Nylon-66, polystyrene

MATHEMATICS

11. Fifteen persons, among whom are A and B, sit down at random at a round table. If p is the probability that there are exactly 4 persons between A and B, find $7p$.
12. A locker can be opened by dialing a fixed three digit code (between 000 and 999). A stranger, who does not know the code, tries to open the locker by dialing three digits at random. If p is the probability that the stranger succeeds at the k th trial, find $1000p$. (Assume that the stranger does not repeat unsuccessful combinations).
13. If $\sin A$, $\cos A$ and $\tan A$ are in G.P, then the value of $\cot^6 A - \cot^2 A$ is
14. If $\sin x + \sin^2 x + \sin^3 x = 1$, then the value of $\cos^6 x - 4\cos^4 x + 8\cos^2 x$ is
15. Number of solutions of pairs (x, y) of the equation $\sin x \sin y = \min \{-1, a^2 - 4a + 5\}$, $a \in \mathbb{R}$, where $0 < x < \pi$, $-\pi < y < 0$ is

JEE-ADVANCE: TEST-11

TEST SERIES

PAPER-I

Time : 3 hrs.

M.M.: 180

TEST CODE - A

ANSWERS

Physics: Section I to II

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

Chemistry: Section I to II

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

Mathematics: Section I to II

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

Section-III (PCM)

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