IIT/AIIMS - 2028 SCREENING TEST - KEY WITH HINTS

Date : 5th October 2025

SECTION A - PHYSICS

1. If the acceleration due to gravity is 10 ms^{-2} and the units of length and time are changed in kilometre and hour, respectively, the numerical value of the acceleration is

   1) 360,000

   2) 72,000

   3) 36,000

   4) 129,600

Ans. 4 $g = 10\frac{m}{s^2} = \frac{10\times\left(10^{-3}\,km\right)}{\left(\frac{1}{3600}\,h\right)} = 10\times3600\times3600\times10^{-3}\,kmh^{-2}$

Therefore, $g = 129600\ kmh^{-2}$

2. Which of the following statements is NOT true?

   1) Displacement has no specific direction

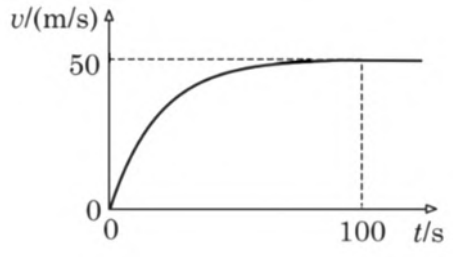
   2) Displacement has specific direction

   3) Displacement of a body can be zero

   4) Magnitude of displacement is equal or less than the distance travelled

Ans. 1 Displacement is a vector quantity so it has a definite direction

3. Two cars A and B simultaneously start a race. Velocity '*v*' of the car A varies with time 't' according to the graph shown in the figure. It aquires a velocity 50 m/s few seconds before t = 100 s and thereafter moves with this speed. Car B runs together with car A till both acquire a velocity 20 m/s; after this, car B moves with zero acceleration for one second and then follows velocity-time profile identical to that of A with a delay of one second. In this way, car B acquires the velocity 50 m/s one second after A acquires it. How much more distance Δs in in meter does the car A cover in the first 100 s as compared to the car B?



1) $\Delta s = 20$ m 2) $\Delta s < 30$ m 3) $\Delta s = 30$ m 4) Insufficient information

Ans. 3 $\Delta s = (50 - 20) = 30$

4. Splitting of light into its colours is called:-

1) Scattering 2) Dispersion 3) Refraction 4) Reflection

Ans. 2 The phenomenon of splitting the light is called dispersion of light

5. An electric fan is placed on a stationary boat and air is blown with it on the sail of the boat. Which of the following statement(s) is/are correct?

1) The boat will be uniformly accelerated in the direction of flow of air

2) The boat will start moving with uniform speed

3) The boat will be uniformly accelerated opposite to the direction of flow of air

4) The boat will remain stationary as before

Ans. 4 $F_{net} = 0$. So the boat remain stationary

6. When a satellite in a circular orbit around the earth enters the atmospheric region, it encounters small air resistance to its motion. Then

1) Its kinetic energy increases

2) Its kinetic energy decreases

3) Its period of revolution around the earth increases

4) Gravitational force on satellite decreases

Ans. 1 The air resistance reduce the speed of satellite that unbalance the gravitational and centripetal forces. This cause the body to accelerate downward because gravitation force become greater than centripetal force. The velocity downward increase and velocity on sidewise decrease. Since gravitational force is greater than resistance. Its net velocity (speed) will increase so its KE increase.

7. A body is under the action of two equal and opposite forces, each of 3N. The body is displaced by 3m. The work done is

1) +9 J 2) –9 J 3) 0 4) 18 J

Ans. 3 $F_{net} = 0$, $W = F_{net}.d = 0$

8. The radius of curvature of a convex mirror is 25cm. Calculate its focal length

1) 50 cm 2) 12.5 cm 3) 30 cm 4) 25 cm

Ans. 2 $f = R/2 = \frac{25}{2} = 12.5$

9. A student has 10 resistors of resistance 'r' each. The minimum resistance made by him from given resistors is:

1) 10 r 2) $\frac{r}{10}$ 3) $\frac{r}{100}$ 4) $\frac{r}{5}$

Ans. 2 Minimum when all connected in parallel $R = \frac{r}{10}$

10. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is

1) towards north 2) towards south 3) towards east 4) towards west

Ans. 1 Using right hand rule

11. The value of g on earth surfae is 9.8 m/s^2 then the value of g at earth's centre in m/s^2 is

1) 9.8 2) 19.6 3) 4.9 4) zero

Ans. 4 At earth centre $F_G = 0 \Rightarrow$ $= 0$

12. The electrical appliances in a house are connected in:

1) Series 2) Parallel

3) Either in series or parallel 4) Both in series and parallel

Ans. 2 To get equal voltage appliances are connected in parallel

13. The distance travelled by a body is directly proportional to time. Then the force acting on body will be:

1) 1N 2) 9.8 N 3) 0 N 4) 98 N

Ans. 3

14. The frequency of a sound wave is 'n' and its velocity is 'v'. If the frequency is increased to 4n, the velocity of the wave will be

1) v 2) 2v 3) 4v 4) v/4

Ans. 1 Velocity of sound doesnot depend on frequency

15. A candle flame 3 cm is placed at distance of 3m from a wall. How far from wall must a concave mirror be placed in order that it may form an image of flame 9 cm high on the wall

1) 225 cm 2) 300 cm 3) 450 cm 4) 650 cm

Ans. 3 $m = \frac{-V}{u}; \frac{-9}{3} = \frac{(3+x)}{x}$

$3x = 3x;\ x = \frac{3}{2} = 150$ cm

Distance from wall to mirror = 3 + x = 300 + 150 = 450 cm

SECTION B - PHYSICS

16. Two resistors 4Ω and 6Ω are connected in series. The effective resistance in ohm is

Ans. 10 In series combination $R = R_1 + R_2 = 4 + 6 = 10\Omega$

17. The force acting on a particle is 5N. The velocity of the particle at an instant is 10 m/s. The power at the instant in W is

Ans. 50 P = F.V = 5 × 10 = 50

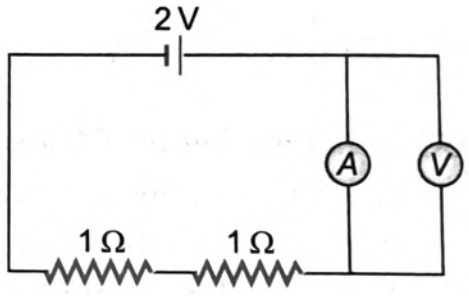
18. When a particle is moving with a constant velocity, its acceleration in m/s^2 is

Ans. 0

19. The force acting on a particle of mass 2kg is 50 N. The acceleration of the particle in m/s^2 is

Ans. 25 $a = \frac{F}{m} = \frac{50}{20} = 25$

20. In the circuit shown, A and V are ideal ammeter and voltmeter respectively. Reading of the voltmeter in volt will be :

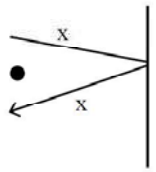


Ans. 0 Resistance across ideal ammeter = 0

$V = IR$; $R = 0$; $V = 0$

21. A man standing on a cliff claps his hand hears its echo after 1s. If found is reflected from mountain and velocity of sound in air is 340 ms^{-1}. Then the distance between the man and reflection point in meter is

Ans. 170 Sound travel 2x distance where x is the distance between man and cliff



$$V = {}^{d}\!/_{t} \Rightarrow 340 = \frac{2x}{1} \Rightarrow 2x = 340;\ x = 170$$

22. A convex lens of focal length 10 cm produces an image which is having same size as that of the object. The magnitude of object distance from the lens in cm is

Ans. 20 Image and object is same size when object is at 2F. $2 \times 10 = 20$

23. A mass of 5kg is taken to a depth of 2m. Work done by gravity in joule is [$g = 10\ m/s^2$]

Ans. 100 $Wg = Fg \times d = mg \times 2 = 5 \times 10 \times 2 = 100$

24. 50C of charge flown through a circuit in 10 second. The current flowing through the circuit in ampere is

Ans. 5 $I = \frac{q}{t} = \frac{50}{10} = 5$ sec

25. Weight of an object at the surface of the earth is 60 N. The mass of the object at the surface of the moon in kg is [$g_{earth} = 10 m/s^2$]

Ans. 6 $g_{moon} = {}^{g_{earth}}\!/_{6}$

$60 = m \times 10;\ m = 6$ kg

SECTION A - CHEMISTRY

26. In which among the following electrovalent compounds both cation and anion posses the same inert gas configuration?

1) Calcium fluoride (CaF_2)
2) Sodium chloride (NaCl)
3) Magnesium chloride ($MgCl_2$)
4) Sodium oxide (Na_2O)

Ans. 4

27. Which statement among the following is incorrect?

1) 22 carat gold is an alloy. It is gold alloyed with either silver or copper

2) Cinnabar an alloy of mercury and sulphur (Hg and S) is an amalgam

3) Brass an alloy of copper and zinc (Cu and Zn) is not a good conductor of electricity

4) Solder an alloy of lead and tin (Pb and Sn) has low melting point

Ans. 2 Cinnabar (HgS) is an ore of mercury

28. The element among the following which has two electrons in the outer most shell is

1) Magnesium (Mg) 2) Sodium (Na)

3) Oxygen (O) 4) Fluorine (F)

Ans. 1 E.C. of $_{12}Mg$ is 2, 8, 2

29. $^{x}_{y}A$ and $^{p}_{q}B$ are isotopes. Which equation among the following is correct regarding the isotopes?

1) $(x^2 - p^2)(y^2 - q^2) = 0$

2) $(x^2 + p^2)(y^2 + q^2) = 0$

3) $(x^2 - q^2)(y^2 - p^2) = 0$

4) $(x^2 + q^2)(y^2 + q^2) = 0$

Ans. 1 $^{x}_{y}A$ and $^{p}_{q}B$ are isotopes ; y = q since atomic number is the same

30. The reaction commonly used in the hydrogenation of vegetable oils using a catalyst belongs to

1) Substitution reaction

2) Oxidation reaction

3) Addition reaction

4) Combustion reaction

Ans. 3 Hydrogenation of vegetable oils is addition reaction

31. The liquid non-metal at room temperature (298 K) is

1) Chlorine 2) Mercury 3) Phosphorus 4) Bromine

Ans. 4 Bromine is liquid at 298 K

32. Given below are two statements, one is labelled as Asserion (A) and the other is labelled as Reason (R).

Assertion (A) : Hydrogen gas is evolved when zinc (Zn) metal react with dilute hydrochloric acid

Reason (R) : all metals displaces hydrogen from dilute hydrochloric acid

In the light of the above statemetns select the most appropriate answer from options given below

1) Both A and R are correct and R is the correct explanation of A

2) Both A and R are correct and R is not the correct explanation of A

3) A is correct but R is false

4) R is correct but A is false

Ans. 3 Assertion is correct but reason is wrong

33. On treating with aqueous sodium hydroxide which is an alkali, ester is converted into to alcohol and sodium salt of carboxylic acid. This reaction is known as

1) Esterification
2) Neutralisation
3) Saponification
4) Dehydration

Ans. 3 Alkali catalysed hydrolysis of ester is called saponification

34. The formula of compound formed between two elements (A) and (B) having atomic numbers 1 and 17 respectively, is

1) AB
2) AB_2
3) A_2B_3
4) A_3B_2

Ans. 1 The compound is HCl.

35. Four substances were thoroughly mixed with water separately to obtain mixtures A, B, C and D. Some of their properties are given below:

I) Path of a beam of light passing through it was visible in A, B and D but invisible in C

II) On leaving undisturbed, the particles of the substance settle down in A but not in B, C and D

III) The solute particles are visible to naked eye in a but invisible in B, C and D

Which of the following is correct about A, B, C and D?

1) A, B and D are colloids, C is a solution

2) A is a suspension, B and D are colloids, C is a solution

3) A is a colloid, B, C and D are solutions

4) A is a suspension, B, C and D are colloids

Ans. 2 A is suspension as particles are visible to naked eye and settle down

C is solution as beam of light is invisible in it
B and D are colloids as particles are invisible and beam of light visible.

36. The smallest particle of an element or a compound that shows all the properties of the substance and have free existence is a/an

1) molecule 2) radical 3) atom 4) ion

Ans. 1 Definition of molecule

37. Match **List-I** with **List-II.**

List-I (reaction)		List-II (Type of reaction)	
i)	A compound breaks apart into elements	p)	Combination
ii)	A metal and non metal react to form an ionic compound	q)	Decomposition
iii)	A compound of hydrogen and carbon react with oxygen to produce carbon dioxide and water	r)	Displacement
iv)	Silver ion from $AgNO_{3(aq)}$ forms precipitate with bromide ions from $KBr_{(aq)}$	s)	Double displacement
		t)	Combustion

Choose the most appropriate answer from the options given below

1) (i) - q; (ii) - p; (iii) - r; (iv) - s

2) (i) - q; (ii) - p; (iii) - t; (iv) - s

3) (i) - s; (ii) - r; (iii) - q; (iv) - p

4) (i) - q; (ii) - t; (iii) - q; (iv) - r

Ans. 2 (i) decomposition (ii) Combination (iii) Combustion (iv) Double displacement

38. The correct set of co-efficients x, y, z and w for the balanced chemical equation

$xNH_{3(g)} + yO_{2(g)} \longrightarrow zNO_{(g)} + wH_2O_{(g)}$ is

1) x = 4; y = 6; z = 4; w = 5

2) x = 5; y = 4; z = 5; w = 6

3) x = 4; y = 6; z = 4; w = 7

4) x = 4; y = 5; z = 4; w = 6

Ans. 4 The balanced chemical equation is $4NH_{3(g)} + 5O_{2(g)} \longrightarrow 4NO_{(g)} + 6H_2O_{(g)}$

39. An element X reacts with dilute H_2SO_4 as well as with NaOH to produce salt and H_2(g). Hence, it may be concluded that

I) X is an electropositive element II) Oxide of X is basic in nature

III) Oxide of X is acidic in nature IV) X is an electronegative element

1) I, II, III 2) IV, I, III 3) III, IV, I 4) II, III, IV

Ans. 1 X is amphoteric in nature and electropositive

40. Butanone is a four carbon compound with the functional group of which class of compounds among the following?

1) Carboxylic acid 2) Ketone 3) Aldehyde 4) Alcohol

Ans. 2 Butanone ie $CH_3COCH_2CH_3$ is a ketone

SECTION B - CHEMISTRY

41. Formula unit mass is calculated the same way as molecular mass is calculated. The formula unit mass of Aluminium sulphate is ..... u (Given : Atomic mass of H = 1u, N = 14 u, O = 16u, S = 32u, Al = 27u, Na = 23u)

Ans. 342 Aluminium sulphate is $Al_2(SO_4)_3$

42. How many of the following are organic compounds?

i) Ammonium cyanate ii) Fullerene iii) Acetic acid

iv) Sodiumbicarbonate v) Urea vi) Carbonic acid

Ans. 2 Acetic acid and urea are organic compounds

43. Number of atoms present in a molecule of hydrogen is .....

Ans. 2 Hydrogen molecule is H_2

44. Consider the binary compounds CO, NO, Na_2O, CaO, H_2O, ZnO, CO_2, NO_2, Al_2O_3 and CuO. The number of compounds among these that are neither basic nor amphoteric are .....

Ans. 5 CO_2 and NO_2 are acidic. CO, NO and H_2O are neutral

45. How many of the following are gases at 1 atmosphere prsent and 300 K temperature?

i) Carbon dioxide (CO_2) , ii) Diamond ($C_{diamond}$), iii) Gold (Au), iv) Nitrogen (N_2), (v) Silver (Ag), (vi) Oxygen (O_2)

Ans. 3 N_2, O_2 and CO_2 are gases diamond, Au and Ag are solids.

46. The number of electrons present in the outermost shell of Neon (Atomic number = 10) is .....

Ans. 8 E.C. of $_{10}Ne$ is 2, 8

47. For how many of the following substances pH is equal to or more than 7 at 298 K?

i) Gastric juice ii) Blood iii) Aqueous sodium hydroxide

iv) Pure water v) Milk of magnesia vi) Lemon juice

Ans. 4 Milk of magnesia, pure water, blood, NaOH (aq)

48. Number of atoms in one formula unit of washing soda is 'x' and number of atoms in one formula unit of bakingsoda is 'y'. Give the value of $(x \times y)$

Ans. 216 Washing soda is $Na_2CO_3.10H_2O$

x = 36
Baking soda is $NaHCO_3$
y = 6

49. How many of the following can displace copper from aqueous copper sulphate?

i) Magnesium (Mg) ii) Gold (Au) iii) Iron (Fe) iv) Hydrogen gas (H_2)

v) Mercury (Hg) vi) Lead (Pb) vii) Silver (Ag) viii) Zinc (Zn)

Ans. 5 Mg, Zn, Fe, Pb and H_2 can displace Cu from $CuSO_4$ solution

50. How many of the following statement(s) is/are correct?

i) Sodium and potassium catch fire if kept in open. Hence to protect them and prevent accidental fires they are kept immersed in water

ii) At ordinary temperature the surface of metals such as magnesium (Mg), Aluminium (Al), Zinc (Zn) and Lead (Pb) are covered with a thin layer of oxide

iii) Iron does not burn on heating

iv) Copper burn vigorously on heating

v) Silver and copper do not react with oxygen even at high temperature

Ans. 2 Only (ii) and (iii) are correct statements

SECTION A - MATHEMATICS

51. The hypotenuse of a right triangle is 26 cm and its perimeter is 60 cm. Then area of the triangle is

1) 128 cm^2 2) 180 cm^2 3) 120 cm^2 4) 182 cm^2

Ans. 3

$x + y + 26 = 60$

$x + y = 34$

$x^2 + y^2 = 26^2 = 676$

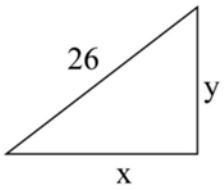
$\therefore (x + y)^2 = 34^2$

$x^2 + y^2 + 2xy = 1156$

$2xy = 1156 - 676$

$xy = 240$

$\text{Area} = \frac{1}{2}xy = 120$



52. What is the remainder, when $x^2 + 1$ is divided by $x + 1$?

1) 0 2) 1 3) 2 4) 3

Ans. 3 $P(x) = x^2 + 1$, then the remainder $P(-1) = (-1)^2 + 1 = 2$

53. If $x + k$ is a factor of $x^3 + kx^2 - 2kx - k - 6$, then positive value of k is

1) 1 2) 2 3) 3 4) $\frac{3}{2}$

Ans. 2 $P(x) = x^3 + Kx^2 - 2Kx - K - 6$

$P(-K) = -K^3 + K^3 + 2K^2 - K - 6 = 0$

$\therefore 2K^2 - K - 6 = 0$

$2K^2 - 4K + 3K - 6 = 0$

$2K(K-2) + 3(K-2) = 0$

$(K-2)(2K+3) = 0 \Rightarrow K = 2, \frac{-3}{2} \Rightarrow K = 2$

54. 19^{th} term of the sequence 1, 4, 7, 10 ..... is

1) 54 2) 55 3) 56 4) 57

Ans. 2 $t_n = a + (n-1)d$

$t_{19} = 1 + 18 \times 3 = 55$

55. A six digit number 71521K is divisible by 3 and 5 then K is

1) 2 2) 0 3) 3 4) 5

Ans. 4 K is 0 or 5 and 7 + 1 + 5 + 2 + 1 + K = M(3),

When K = 0, sum of digits $\neq$ M(3); K=5 sum of digits = M(3)

$\Rightarrow$ K = 5

56. If $m^2 - 7m + 1 = 0$ then $m + \frac{1}{m}$ is

1) 5 2) 7 3) 3 4) 1

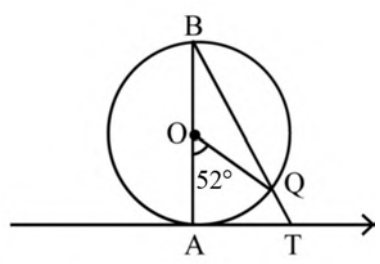
Ans. 2 $m^2 - 7m + 1 = 0 \Rightarrow m + \frac{1}{m} = 7$

57. Which rational expression should be added with $3x^2 + 2x + 1$ to get $4x^2 + 5x + 3$?

1) $x^2 + 3x - 2$ 2) $x^2 - 3x + 2$ 3) $x^2 - 3x - 2$ 4) $x^2 + 3x + 2$

Ans. 4 $P(x) = \left(4x^2 + 5x + 3\right) - \left(3x^2 + 2x + 1\right) = x^2 + 3x + 2$

58. In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 52°$, then the degree measure of $\angle ATQ$ is .....

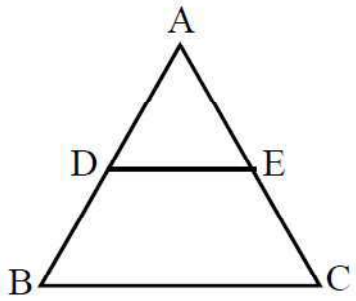


1) 64° 2) 46° 3) 56° 4) 65°

Ans. 1 $\angle OBQ = \frac{1}{2}\angle AOQ = 26°$

In ΔABT, $\angle OBQ + \angle ATQ = 90° \Rightarrow ATQ = 64°$

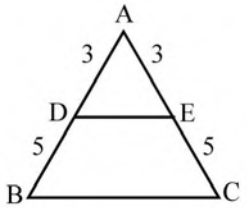
59. From the adjacent figure of triangle ABC, DE||BC and $\frac{AD}{DB}=\frac{3}{5}$. If AC = 16, then EC is



1) 12 2) 10 3) 11 4) 14

Ans. 2 $\frac{AD}{DB}=\frac{AE}{EC}=\frac{3}{5}\Rightarrow\frac{AE+EC}{EC}=\frac{3+5}{5}$

$\therefore\frac{AC}{EC}=\frac{8}{5}\Rightarrow EC=\frac{AC\times5}{8}=\frac{16\times5}{8}=10$



60. A field ABC is in the form an equilateral triangle. There are two pillers AP of height 80m and BQ of height 20m are placed at two corner of the field ABC at A and B. If is given that $\angle ACP$ and $\angle BCQ$ are complementary to each other $(\text{ie, } \angle ACP + \angle BCQ = 90°)$. If D be a point on AB, so that $\angle BDQ$ is equal to $\angle ADP$. Then AD × DB is

1) 144 2) 216 3) 256 4) 284

Ans. 3

In ΔPAC, $\tan\alpha = \frac{80}{a}$; $\tan\beta = \frac{20}{a}$

where, $\alpha = \angle ACP$, $\beta = \angle BCQ$; Given $\alpha + \beta = 90°; \beta = 90 - \alpha$

$\tan\beta = \tan(90 - \alpha) = (0 + \alpha)$

$\tan\alpha . \tan\beta = 1$

$\frac{80}{a} . \frac{20}{a} = 1 \Rightarrow a^2 = 100;\ a = 40$

Let $AD = x$ then $BD = 40 - x$

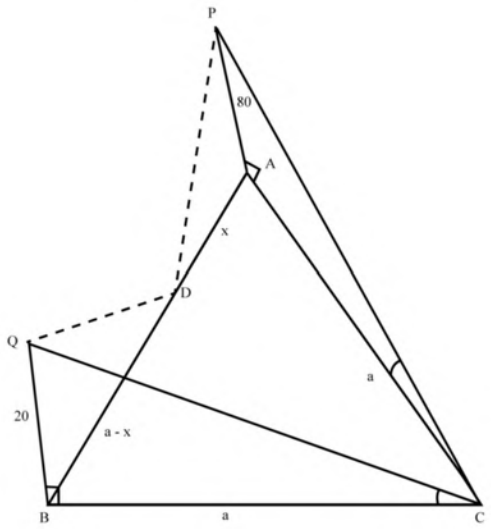
$\tan\angle ADP = \frac{80}{x}$ $\tan\angle BDQ = \frac{20}{40 - x}$

Given $\angle ADP = \angle BDQ \Rightarrow \frac{80}{x} = \frac{20}{40 - x}$

$\Rightarrow 4(40 - x) = x;\ 160 - 4x = x \Rightarrow 5x = 160; x = 32$

$\therefore$ AD = 32, then $BD = 40 - 32 = 8$

$\therefore AD.DB = 32 \times 8 = 256$



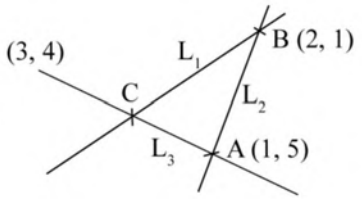
61. Equations of three straight lines are given below $L_1 : 3x - y = 5$, $L_2 : 4x + y = 9$ and $L_3 : x + 2y - 11 = 0$. The lines L_2, L_3 intersect at A (a, p); L_1, L_2 intersect at B(b, q) and L_3, L_1 intersect at C(c, r). If $k = \frac{a^2 + b^2 + c^2}{p - 2q + r}$ and $l = \frac{a + b + c + 3}{p^2 - r^2}$ then which of the following is not TRUE?

1) $7k + 3l = 17$ 2) $5k - 6l = 4$ 3) $3k + 2l = 8$ 4) $4k + 3l = 10$

Ans. 4 $L_1 : 3x - y = 5$; $L_2 : 4x + y = 9$; $L_3 : x + 2y = 11$

Solving L_2 and L_3

$$\begin{array}{l} 8x + 2y = 18 \\ \quad x + 2y = 11 \\ \hline 7x \qquad \Rightarrow 7 \Rightarrow x = 1;\ y = 5 \Rightarrow A(1,5) \end{array}$$



Solving L_1 and L_3

$$\begin{array}{l} 6x - 2y = 10 \\ \quad x + 2y = 11 \\ \hline 7x \quad = 21 \Rightarrow x = 3 \text{ and } y = 4 \Rightarrow C(3,4) \end{array}$$

Solving L_1 and L_2

$$\begin{array}{l} 3x - y = 5 \\ \quad 4x + y = 9 \\ \hline 7x \quad = 14 \Rightarrow x = 2 \text{ and } y = 1 \Rightarrow B(2,1) \end{array}$$

$A(1, 5) \Rightarrow a = 1;\ p = 5$
$B(2, 1) \Rightarrow b = 2;\ q = 1$
$C(3, 4) \Rightarrow c = 3;\ r = 4$

$$K = \frac{a^2 + b^2 + c^2}{p - 2q + r} = \frac{1^2 + 2^2 + 3^2}{5 - 2 + 4} = \frac{14}{7} = 2$$

$$\ell = \frac{a + b + c + 3}{p^2 - q^2} = \frac{1 + 2 + 3 + 3}{25 - 16} = \frac{9}{9} = 1$$

1) $7K + 3l = 14 + 3 = 17$ true
2) $5K - 6l = 10 - 6 = 4$ true
3) $3K + 2l = 6 + 2 = 8$ true
4) $4K + 3l = 8 + 3 = 11$ false

62. In the figure O is centre of the circle and $\angle AOB = 102°$. Then $\angle P + \angle Q + \angle R$ is

1) 153° 2) 183° 3) 165° 4) 200°

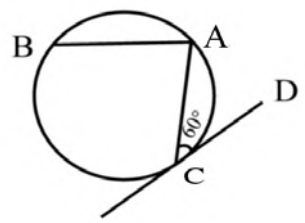
Ans. 1 $\angle P = \angle Q = \angle R = \frac{1}{2}\angle AOB = 51; \therefore \angle P + \angle Q + \angle R = 153°$

63. $6\sin 30° + 2\cos 30°$ is

1) $1 + 3\sqrt{3}$ 2) $2 + 3\sqrt{3}$ 3) $3 + \sqrt{3}$ 4) $3 + 2\sqrt{3}$

Ans. 3

64. In the figure AB = AC and $\overline{CD}$ is a tangent at C. If $\angle ACD = 60°$, then $\angle BAC$ is



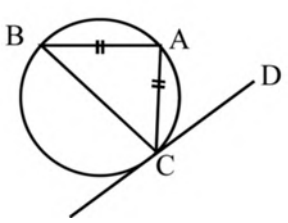
1) 50° 2) 55° 3) 65° 4) 60°

Ans. 4 Given $\angle ACD = 60°$

$\therefore \angle ABC = 60°$

$\therefore \angle ACB = 60°$ Since AB = AC

$\therefore \angle BAC = 60°$



65. N_i is a two digit number formed by the digits 1, 2, 3, 4 and 5, with repetition is allowed, that is $N_1 = 11$ and $N_{25} = 55$. Let $S(N_i)$ denote the sum of the digits of N_i. Then $S(N_1) + S(N_2) + ... + S(N_{25})$ is

1) 150 2) 175 3) 200 4) 225

Ans. 1 Here unit and tens places of each digit repeats 5 times

Therefore sum of all digits = $5(1 + 2+ 3+4+5) + 5(1 + 2 + 3 + 4 + 5) = 5 \times 15 + 5 \times 15$
$= 75 + 75 = 150$

SECTION B - MATHEMATICS

66. Value of $\left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)$ is

Ans. 12 $\left(2+\sqrt{2}\right)\left(2-\sqrt{2}\right)=4-2=2$

$\left(3+\sqrt{3}\right)\left(3-\sqrt{3}\right)=9-3=6$

$\therefore \left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)=2\times 6=12$

67. If $76^2 + 56^2 + 75^2 - 44^2 - 25^2 - 24^2 = 100K$, then the value of K is

Ans. 114 $\left(76^2-24^2\right)+\left(56^2+44^2\right)+\left(75^2-25^2\right)=100\times 52+100\times 12+100\times 50$

$=100\left(52+12+50\right)=11400=100\ \text{K}\Rightarrow \text{K}=114$

68. If sum of three consecutive terms of an arithmetic progression is 18. Then the middle term is

Ans. 6 a–d + a + a + d = 18 $\Rightarrow$ 3a = 18, a = 6

69. Sum of LCM and HCF of 24 and 33 is

Ans. 267 HCF = 3

LCM = 264, HCF + LCM = 3 + 264 = 267

70. Coefficient of x in the expression $\frac{x^2-4}{x-2}$ is

Ans. 1 $\frac{x^2-4}{x-2}=x+2$

71. The number of ordered pair (x,y) satisfy the equations $7x - y = 16$ and $5x + y = 20$, is

Ans. 1 $7x - y = 16$ and $5x + y = 20$

Solving $x = 3$ and $y = 5$; $(x,y) = (3,5)$

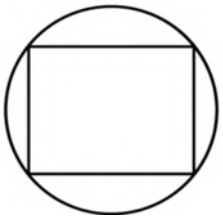
72. If $x - 1$ is a factor of $2x^3 + \lambda x^2 - 8x - 11 = 0$, then the value of '$\lambda$' is

Ans. 17 $P(x) = 2x^3 + \lambda x^2 - 8x - 11$

$P(1) = 2 + \lambda - 8 - 11 = 0$

$\Rightarrow \lambda - 17 = 0 \Rightarrow \lambda = 17$

73. A circle is circumscribed a square of perimeter 40 cm as in the following figure. If diameter of the circle is $k\sqrt{2}$, then k is



Ans. 10 $4a = 40 \Rightarrow a = 10$

Diameter of circle = diagonal of the square $= 10\sqrt{2} = K\sqrt{2} \Rightarrow K = 10$

74. Sum of all prime numbers less than 10 is

Ans. 17 $2 + 3 + 5 + 7 = 17$

75. Coefficient of x in $(x + 3)^2 - (x - 3)^2$ is

Ans. 12 $(x + 3)^2 - (x - 3)^2 = (x^2 + 6x + 9)(x^2 - 6x - 9) = 12x$

Brilliant STUDY CENTRE PALA

IIT/AIIMS - 2028 SCREENING TEST

QUESTION BOOKLET CODE

A

Date : 5th October 2025

IMPORTANT INSTRUCTIONS

Please read the instructions carefully

1. Do not break the seal of this question booklet before being instructed to do so by the invigilators
2. Please fill in all the details such as name, roll number and signature of the candidate in the columns given below.
3. The test is of **2 hour** duration.
   This question booklet contains 75 questions and **Maximum Mark is 240**
4. There are three Parts. Physics, Chemistry & Mathematics having 25 questions each. Each Part consists of two Sections. **In Section A** (15 questions) each question has four options (1), (2), (3) and (4). **Only one** of these four options is correct. Each correct answer will be awarded **FOUR** marks. **ONE** mark will be deducted for each incorrect answer.
5. **In Section B** (10 questions). **Out of these 10 questions candidate can choose to attempt any 5 questions.In the event of a candidate attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.** Each question has an answer which is a number with one/two/three digits. Each correct answer will be awarded **FOUR** marks. **NO NEGATIVE** mark for incorrect answer in Section B
6. Mark the bubble corresponding to the Answer in the Optical Response Sheet (ORS) by using either **Blue or Black ball - point pen only**
7. More than one answer marked against a question will be deemed as incorrect answer.
8. No negative mark for unattended Question.
9. Question paper booklet code is printed on the right hand top of this booklet
10. The paper CODE is printed on the right part of the ORS. Ensure that the code is identical and same as that on the question paper booklet. If not, contact the invigilator for change.
11. Handover the Answer sheet to the invigilator at the end of the examination

IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 75 QUESTIONS. IF NOT, REQUEST FOR REPLACEMENT

Name of the Candidate	Roll Number
I have read all the instructions and shall abide by them _ _ _ _ _ _ _ _ _ _ _ **Signature of the Candidate**	**I have verified all the information filled by the candidate** _ _ _ _ _ _ _ _ _ _ _ **Signature of the Invigilator**

SPACE FOR ROUGH WORK

PART I - PHYSICS

This part contains 25 questions

SECTION - A

Physics - Question No. - (1-15)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Physics - Question No. - (16 - 25)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

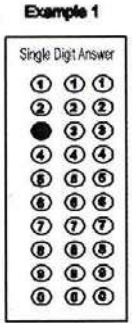
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

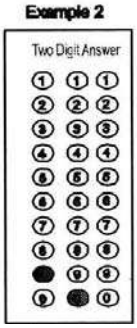
If Single Digit Answer

If answer is 3



If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180

SPACE FOR ROUGH WORK

SECTION A - PHYSICS

1. If the acceleration due to gravity is 10 ms^{-2} and the units of length and time are changed in kilometre and hour, respectively, the numerical value of the acceleration is

   1) 360,000

   2) 72,000

   3) 36,000

   4) 129,600

2. Which of the following statements is NOT true?

   1) Displacement has no specific direction

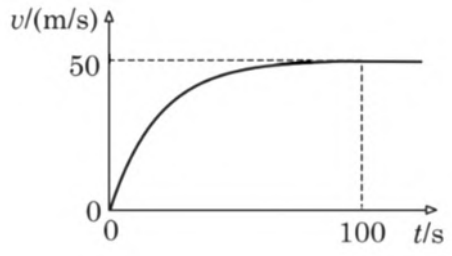
   2) Displacement has specific direction

   3) Displacement of a body can be zero

   4) Magnitude of displacement is equal or less than the distance travelled

SPACE FOR ROUGH WORK

3. Two cars A and B simultaneously start a race. Velocity 'v' of the car A varies with time 't' according to the graph shown in the figure. It aquires a velocity 50 m/s few seconds before t = 100 s and thereafter moves with this speed. Car B runs together with car A till both acquire a velocity 20 m/s; after this, car B moves with zero acceleration for one second and then follows velocity-time profile identical to that of A with a delay of one second. In this way, car B acquires the velocity 50 m/s one second after A acquires it. How much more distance Δs in in meter does the car A cover in the first 100 s as compared to the car B?



1) $\Delta s = 20$ m

2) $\Delta s < 30$ m

3) $\Delta s = 30$ m

4) Insufficient information

SPACE FOR ROUGH WORK

4. Splitting of light into its colours is called:-

1) Scattering

2) Dispersion

3) Refraction

4) Reflection

5. An electric fan is placed on a stationary boat and air is blown with it on the sail of the boat. Which of the following statement(s) is/are correct?

1) The boat will be uniformly accelerated in the direction of flow of air

2) The boat will start moving with uniform speed

3) The boat will be uniformly accelerated opposite to the direction of flow of air

4) The boat will remain stationary as before

SPACE FOR ROUGH WORK

6. When a satellite in a circular orbit around the earth enters the atmospheric region, it encounters small air resistance to its motion. Then

1) Its kinetic energy increases

2) Its kinetic energy decreases

3) Its period of revolution around the earth increases

4) Gravitational force on satellite decreases

7. A body is under the action of two equal and opposite forces, each of 3N. The body is displaced by 3m. The work done is

1) +9 J 2) –9 J 3) 0 4) 18 J

8. The radius of curvature of a convex mirror is 25cm. Calculate its focal length

1) 50 cm 2) 12.5 cm 3) 30 cm 4) 25 cm

SPACE FOR ROUGH WORK

9. A student has 10 resistors of resistance 'r' each. The minimum resistance made by him from given resistors is:

1) 10 r 2) $\frac{r}{10}$ 3) $\frac{r}{100}$ 4) $\frac{r}{5}$

10. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is

1) towards north

2) towards south

3) towards east

4) towards west

11. The value of g on earth surfae is 9.8 m/s^2 then the value of g at earth's centre in m/s^2 is

1) 9.8 2) 19.6 3) 4.9 4) zero

SPACE FOR ROUGH WORK

12. The electrical appliances in a house are connected in:

1) Series

2) Parallel

3) Either in series or parallel

4) Both in series and parallel

13. The distance travelled by a body is directly proportional to time. Then the force acting on body will be:

1) 1N

2) 9.8 N

3) 0 N

4) 98 N

SPACE FOR ROUGH WORK

14. The frequency of a sound wave is 'n' and its velocity is 'v'. If the frequency is increased to 4n, the velocity of the wave will be

1) v

2) 2v

3) 4v

4) v/4

15. A candle flame 3 cm is placed at distance of 3m from a wall. How far from wall must a concave mirror be placed in order that it may form an image of flame 9 cm high on the wall

1) 225 cm

2) 300 cm

3) 450 cm

4) 650 cm

SPACE FOR ROUGH WORK

SECTION B - PHYSICS

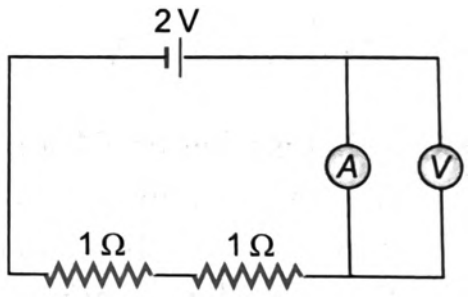
16. Two resistors 4Ω and 6Ω are connected in series. The effective resistance in ohm is

17. The force acting on a particle is 5N. The velocity of the particle at an instant is 10 m/s. The power at the instant in W is

18. When a particle is moving with a constant velocity, its acceleration in m/s^2 is

19. The force acting on a particle of mass 2kg is 50 N. The acceleration of the particle in m/s^2 is

20. In the circuit shown, A and V are ideal ammeter and voltmeter respectively. Reading of the voltmeter in volt will be :



SPACE FOR ROUGH WORK

21. A man standing on a cliff claps his hand hears its echo after 1s. If found is reflected from mountain and velocity of sound in air is 340 ms^{-1}. Then the distance between the man and reflection point in meter is

22. A convex lens of focal length 10 cm produces an image which is having same size as that of the object. The magnitude of object distance from the lens in cm is

23. A mass of 5kg is taken to a depth of 2m. Work done by gravity in joule is [$g = 10\ m/s^2$]

24. 50C of charge flown through a circuit in 10 second. The current flowing through the circuit in ampere is

25. Weight of an object at the surface of the earth is 60 N. The mass of the object at the surface of the moon in kg is [$g_{earth} = 10 m/s^2$]

SPACE FOR ROUGH WORK

PART II - CHEMISTRY

This part contains 25 questions

SECTION - A

Chemistry - Question No. - (26-40)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Chemistry Question No. - (41 - 50)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

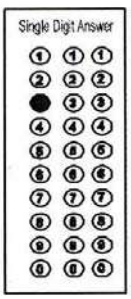
Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

If Single Digit Answer

If answer is 3

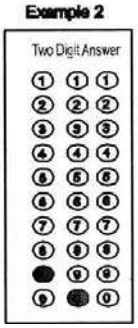
Example 1



If Two Digit Answer

If answer is 90

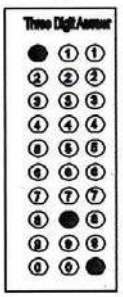
Example 2



If Three Digit Answer

If answer is 180

Example 3



SECTION A - CHEMISTRY

26. In which among the following electrovalent compounds both cation and anion posses the same inert gas configuration?

1) Calcium fluoride (CaF_2)

2) Sodium chloride (NaCl)

3) Magnesium chloride ($MgCl_2$)

4) Sodium oxide (Na_2O)

27. Which statement among the following is incorrect?

1) 22 carat gold is an alloy. It is gold alloyed with either silver or copper

2) Cinnabar an alloy of mercury and sulphur (Hg and S) is an amalgam

3) Brass an alloy of copper and zinc (Cu and Zn) is not a good conductor of electricity

4) Solder an alloy of lead and tin (Pb and Sn) has low melting point

---

SPACE FOR ROUGH WORK

28. The element among the following which has two electrons in the outer most shell is

1) Magnesium (Mg)
2) Sodium (Na)
3) Oxygen (O)
4) Fluorine (F)

29. ${}^{x}_{y}A$ and ${}^{p}_{q}B$ are isotopes. Which equation among the following is correct regarding the isotopes?

1) $(x^2 - p^2)(y^2 - q^2) = 0$
2) $(x^2 + p^2)(y^2 + q^2) = 0$
3) $(x^2 - q^2)(y^2 - p^2) = 0$
4) $(x^2 + q^2)(y^2 + q^2) = 0$

30. The reaction commonly used in the hydrogenation of vegetable oils using a catalyst belongs to

1) Substitution reaction
2) Oxidation reaction
3) Addition reaction
4) Combustion reaction

SPACE FOR ROUGH WORK

31. The liquid non-metal at room temperature (298 K) is

1) Chlorine 2) Mercury 3) Phosphorus 4) Bromine

32. Given below are two statements, one is labelled as Asserion (A) and the other is labelled as Reason (R).

Assertion (A) : Hydrogen gas is evolved when zinc (Zn) metal react with dilute hydrochloric acid

Reason (R) : all metals displaces hydrogen from dilute hydrochloric acid

In the light of the above statemetns select the most appropriate answer from options given below

1) Both A and R are correct and R is the correct explanation of A

2) Both A and R are correct and R is not the correct explanation of A

3) A is correct but R is false

4) R is correct but A is false

33. On treating with aqueous sodium hydroxide which is an alkali, ester is converted into to alcohol and sodium salt of carboxylic acid. This reaction is known as

1) Esterification 2) Neutralisation 3) Saponification 4) Dehydration

SPACE FOR ROUGH WORK

34. The formula of compound formed between two elements (A) and (B) having atomic numbers 1 and 17 respectively, is

1) AB 2) AB_2 3) A_2B_3 4) A_3B_2

35. Four substances were thoroughly mixed with water separately to obtain mixtures A, B, C and D. Some of their properties are given below:

I) Path of a beam of light passing through it was visible in A, B and D but invisible in C

II) On leaving undisturbed, the particles of the substance settle down in A but not in B, C and D

III) The solute particles are visible to naked eye in a but invisible in B, C and D

Which of the following is correct about A, B, C and D?

1) A, B and D are colloids, C is a solution

2) A is a suspension, B and D are colloids, C is a solution

3) A is a colloid, B, C and D are solutions

4) A is a suspension, B, C and D are colloids

36. The smallest particle of an element or a compound that shows all the properties of the substance and have free existence is a/an

1) molecule 2) radical 3) atom 4) ion

SPACE FOR ROUGH WORK

37. Match **List-I** with **List-II.**

List-I (reaction)		**List-II (Type of reaction)**	
i)	A compound breaks apart into elements	p)	Combination
ii)	A metal and non metal react to form an ionic compound	q)	Decomposition
iii)	A compound of hydrogen and carbon react with oxygen to produce carbon dioxide and water	r)	Displacement
iv)	Silver ion from $AgNO_{3(aq)}$ forms precipitate with bromide ions from $KBr_{(aq)}$	s)	Double displacement
		t)	Combustion

Choose the most appropriate answer from the options given below

1) (i) - q; (ii) - p; (iii) - r; (iv) - s

2) (i) - q; (ii) - p; (iii) - t; (iv) - s

3) (i) - s; (ii) - r; (iii) - q; (iv) - p

4) (i) - q; (ii) - t; (iii) - q; (iv) - r

SPACE FOR ROUGH WORK

38. The correct set of co-efficients x, y, z and w for the balanced chemical equation

$xNH_{3(g)} + yO_{2(g)} \longrightarrow zNO_{(g)} + wH_2O_{(g)}$ is

1) x = 4; y = 6; z = 4; w = 5
2) x = 5; y = 4; z = 5; w = 6
3) x = 4; y = 6; z = 4; w = 7
4) x = 4; y = 5; z = 4; w = 6

39. An element X reacts with dilute H_2SO_4 as well as with NaOH to produce salt and H_2(g). Hence, it may be concluded that

I) X is an electropositive element
II) Oxide of X is basic in nature
III) Oxide of X is acidic in nature
IV) X is an electronegative element

1) I, II, III
2) IV, I, III
3) III, IV, I
4) II, III, IV

40. Butanone is a four carbon compound with the functional group of which class of compounds among the following?

1) Carboxylic acid
2) Ketone
3) Aldehyde
4) Alcohol

SECTION B - CHEMISTRY

41. Formula unit mass is calculated the same way as molecular mass is calculated. The formula unit mass of Aluminium sulphate is ..... u (Given : Atomic mass of H = 1u, N = 14 u, O = 16u, S = 32u, Al = 27u, Na = 23u)

SPACE FOR ROUGH WORK

42. How many of the following are organic compounds?

i) Ammonium cyanate ii) Fullerene iii) Acetic acid

iv) Sodiumbicarbonate v) Urea vi) Carbonic acid

43. Number of atoms present in a molecule of hydrogen is .....

44. Consider the binary compounds CO, NO, Na_2O, CaO, H_2O, ZnO, CO_2, NO_2, Al_2O_3 and CuO. The number of compounds among these that are neither basic nor amphoteric are .....

45. How many of the following are gases at 1 atmosphere prsent and 300 K temperature?

i) Carbon dioxide (CO_2) , ii) Diamond ($C_{diamond}$), iii) Gold (Au), iv) Nitrogen (N_2), (v) Silver (Ag), (vi) Oxygen (O_2)

46. The number of electrons present in the outermost shell of Neon (Atomic number = 10) is .....

47. For how many of the following substances pH is equal to or more than 7 at 298 K?

i) Gastric juice ii) Blood iii) Aqueous sodium hydroxide

iv) Pure water v) Milk of magnesia vi) Lemon juice

48. Number of atoms in one formula unit of washing soda is 'x' and number of atoms in one formula unit of bakingsoda is 'y'. Give the value of $(x \times y)$

SPACE FOR ROUGH WORK

49. How many of the following can displace copper from aqueous copper sulphate?

i) Magnesium (Mg) ii) Gold (Au) iii) Iron (Fe) iv) Hydrogen gas (H_2)

v) Mercury (Hg) vi) Lead (Pb) vii) Silver (Ag) viii) Zinc (Zn)

50. How many of the following statement(s) is/are correct?

i) Sodium and potassium catch fire if kept in open. Hence to protect them and prevent accidental fires they are kept immersed in water

ii) At ordinary temperature the surface of metals such as magnesium (Mg), Aluminium (Al), Zinc (Zn) and Lead (Pb) are covered with a thin layer of oxide

iii) Iron does not burn on heating

iv) Copper burn vigorously on heating

v) Silver and copper do not react with oxygen even at high temperature

SPACE FOR ROUGH WORK

PART III - MATHEMATICS

This part contains 25 questions

SECTION - A

Mathematics - Question No. - (51-65)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Mathematics - Question No. - (66 - 75)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

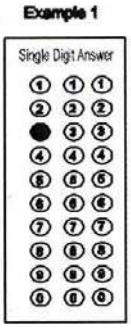
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

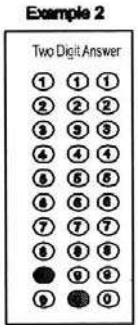
If Single Digit Answer

If answer is 3



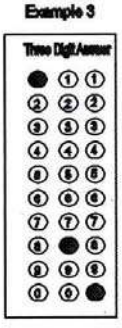
If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180



SECTION A - MATHEMATICS

51. The hypotenuse of a right triangle is 26 cm and its perimeter is 60 cm. Then area of the triangle is

1) 128 cm^2 2) 180 cm^2

3) 120 cm^2 4) 182 cm^2

52. What is the remainder, when $x^2 + 1$ is divided by $x + 1$?

1) 0 2) 1

3) 2 4) 3

53. If $x + k$ is a factor of $x^3 + kx^2 - 2kx - k - 6$, then positive value of k is

1) 1 2) 2

3) 3 4) $\frac{3}{2}$

SPACE FOR ROUGH WORK

54. 19^{th} term of the sequence 1, 4, 7, 10 ..... is

1) 54 2) 55

3) 56 4) 57

55. A six digit number 71521K is divisible by 3 and 5 then K is

1) 2 2) 0

3) 3 4) 5

56. If $m^2 - 7m + 1 = 0$ then $m + \frac{1}{m}$ is

1) 5 2) 7

3) 3 4) 1

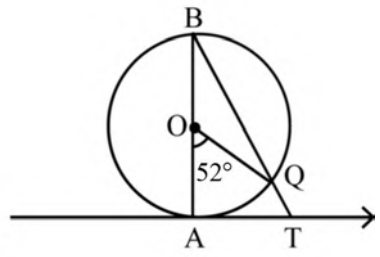
SPACE FOR ROUGH WORK

57. Which rational expression should be added with $3x^2 + 2x + 1$ to get $4x^2 + 5x + 3$?

1) $x^2 + 3x - 2$ 2) $x^2 - 3x + 2$

3) $x^2 - 3x - 2$ 4) $x^2 + 3x + 2$

58. In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 52°$, then the degree measure of $\angle ATQ$ is .....

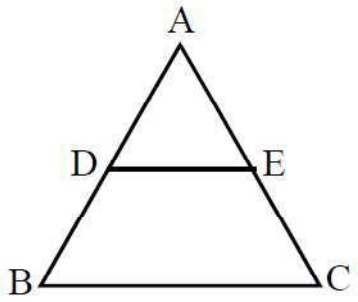


1) 64° 2) 46°

3) 56° 4) 65°

SPACE FOR ROUGH WORK

59. From the adjacent figure of triangle ABC, DE||BC and $\frac{AD}{DB}=\frac{3}{5}$. If AC = 16, then EC is



1) 12 2) 10

3) 11 4) 14

60. A field ABC is in the form an equilateral triangle. There are two pillers AP of height 80m and BQ of height 20m are placed at two corner of the field ABC at A and B. If is given that $\angle ACP$ and $\angle BCQ$ are complementary to each other $(\text{ie, } \angle ACP+\angle BCQ=90°)$. If D be a point on AB, so that $\angle BDQ$ is equal to $\angle ADP$. Then AD × DB is

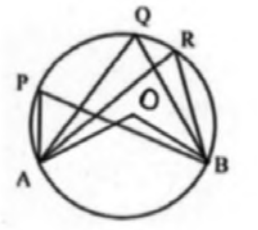
1) 144 2) 216 3) 256 4) 284

SPACE FOR ROUGH WORK

61. Equations of three straight lines are given below $L_1 : 3x - y = 5$, $L_2 : 4x + y = 9$ and $L_3 : x + 2y - 11 = 0$. The lines L_2, L_3 intersect at A (a, p); L_1, L_2 intersect at B(b, q) and L_3, L_1 intersect at C(c, r). If $k = \frac{a^2 + b^2 + c^2}{p - 2q + r}$ and $l = \frac{a + b + c + 3}{p^2 - r^2}$ then which of the following is not TRUE?

1) $7k + 3l = 17$ 2) $5k - 6l = 4$ 3) $3k + 2l = 8$ 4) $4k + 3l = 10$

62. In the figure O is centre of the circle and $\angle AOB = 102°$. Then $\angle P + \angle Q + \angle R$ is



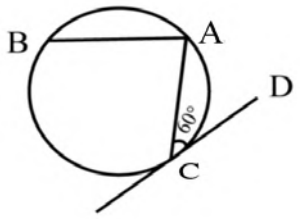
1) 153° 2) 183° 3) 165° 4) 200°

63. $6\sin 30° + 2\cos 30°$ is

1) $1 + 3\sqrt{3}$ 2) $2 + 3\sqrt{3}$ 3) $3 + \sqrt{3}$ 4) $3 + 2\sqrt{3}$

SPACE FOR ROUGH WORK

64. In the figure AB = AC and $\overline{CD}$ is a tangent at C. If $\angle ACD = 60°$, then $\angle BAC$ is



1) 50°

2) 55°

3) 65°

4) 60°

65. N_i is a two digit number formed by the digits 1, 2, 3, 4 and 5, with repetition is allowed, that is $N_1 = 11$ and $N_{25} = 55$. Let $S(N_i)$ denote the sum of the digits of N_i. Then $S(N_1) + S(N_2) + ... + S(N_{25})$ is

1) 150

2) 175

3) 200

4) 225

SPACE FOR ROUGH WORK

SECTION B - MATHEMATICS

66. Value of $\left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)$ is

67. If $76^2 + 56^2 + 75^2 - 44^2 - 25^2 - 24^2 = 100K$, then the value of K is

68. If sum of three consecutive terms of an arithmetic progression is 18. Then the middle term is

69. Sum of LCM and HCF of 24 and 33 is

70. Coefficient of x in the expression $\frac{x^2-4}{x-2}$ is

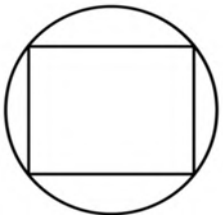
71. The number of ordered pair (x,y) satisfy the equations $7x - y = 16$ and $5x + y = 20$, is

---

SPACE FOR ROUGH WORK

72. If $x-1$ is a factor of $2x^3 + \lambda x^2 - 8x - 11 = 0$, then the value of '$\lambda$' is

73. A circle is circumscribed a square of perimeter 40 cm as in the following figure. If diameter of the circle is $k\sqrt{2}$, then k is



74. Sum of all prime numbers less than 10 is

75. Coefficient of x in $(x+3)^2 - (x-3)^2$ is

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

IIT/AIIMS SCREENING TEST - 05-10-2025

QUESTION BOOKLET CODE

A

P + C + M - ANSWER KEY

PHYSICS

1. 4 $g = 10\frac{m}{s^2} = \frac{10\times\left(10^{-3}\,km\right)}{\left(\frac{1}{3600}h\right)} = 10\times3600\times3600\times10^{-3}\,kmh^{-2}$

   Therefore, $g = 129600\ kmh^{-2}$

2. 1 Displacement is a vector quantity so it has a definite direction

3. 3 $\Delta s = (50-20) = 30$

4. 2 The phenomenon of splitting the light is called dispersion of light

5. 4 $F_{net} = 0$. So the boat remain stationary

6. 1 The air resistance reduce the speed of satellite that unbalance the gravitational and centripetal forces. This cause the body to accelerate downward because gravitation force become greater than centripetal force. The velocity downward increase and velocity on sidewise decrease. Since gravitational force is greater than resistance. Its net velocity (speed) will increase so its KE increase.

7. 3 $F_{net} = 0$, $W = F_{net}.d = 0$

8. 2 $f = R/2 = \frac{25}{2} = 12.5$

9. 2 Minimum when all connected in parallel $R = \frac{r}{10}$

10. 1 Using right hand rule

11. 4 At earth centre $F_G = 0 \Rightarrow$ = 0

12. 2 To get equal voltage appliances are connected in parallel

13. 3

14. 1 Velocity of sound doesnot depend on frequency

15. 3 $m = \frac{-V}{u}; \frac{-9}{3} = \frac{(3+x)}{x}$

    $3x = 3x;\ x = \frac{3}{2} = 150\ cm$

    Distance from wall to mirror = 3 + x = 300 + 150 = 450 cm

16. 10 In series combination $R = R_1 + R_2 = 4 + 6 = 10\Omega$

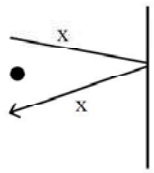
17. 50 P = F.V = 5 × 10 = 50

18. 0

19. 25 $a = \frac{F}{m} = \frac{50}{20} = 25$

20. 0 Resistance across ideal ammeter = 0
V = IR ; R = 0; V = 0

21. 170 Sound travel 2x distance where x is the distance between man and cliff



$V = {}^{d}\!/_{t} \Rightarrow 340 = \frac{2x}{1} \Rightarrow 2x = 340;\ x = 170$

22. 20 Image and object is same size when object is at 2F. $2 \times 10 = 20$

23. 100 $Wg = Fg \times d = mg \times 2 = 5 \times 10 \times 2 = 100$

24. 5 $I = \frac{q}{t} = \frac{50}{10} = 5$ sec

25. 6 $g_{moon} = {}^{g_{earth}}\!/_{6}$

$60 = m \times 10;\ m = 6$ kg

SPACE FOR ROUGH WORK

CHEMISTRY

26. 4
27. 2 Cinnabar (HgS) is an ore of mercury
28. 1 E.C. of $_{12}Mg$ is 2, 8, 2
29. 1 $^{x}_{y}A$ and $^{p}_{q}B$ are isotopes ; y = q since atomic number is the same
30. 3 Hydrogenation of vegetable oils is addition reaction
31. 4 Bromine is liquid at 298 K
32. 3 Assertion is correct but reason is wrong
33. 3 Alkali catalysed hydrolysis of ester is called saponification
34. 1 The compound is HCl.
35. 2 A is suspension as particles are visible to naked eye and settle down
    C is solution as beam of light is invisible in it
    B and D are colloids as particles are invisible and beam of light visible.
36. 1 Definition of molecule
37. 2 (i) decomposition (ii) Combination (iii) Combustion (iv) Double displacement
38. 4 The balanced chemical equation is $4NH_{3(g)} + 5O_{2(g)} \longrightarrow 4NO_{(g)} + 6H_2O_{(g)}$
39. 1 X is amphoteric in nature and electropositive
40. 2 Butanone ie $CH_3COCH_2CH_3$ is a ketone
41. 342 Aluminium sulphate is $Al_2(SO_4)_3$
42. 2 Acetic acid and urea are organic compounds
43. 2 Hydrogen molecule is H_2
44. 5 CO_2 and NO_2 are acidic. CO, NO and H_2O are neutral
45. 3 N_2, O_2 and CO_2 are gases diamond, Au and Ag are solids.
46. 8 E.C. of $_{10}Ne$ is 2, 8

SPACE FOR ROUGH WORK

47. 4 Milk of magnesia, pure water, blood, NaOH (aq)

48. 216 Washing soda is $Na_2CO_3.10H_2O$

$x = 36$

Baking soda is $NaHCO_3$

$y = 6$

49. 5 Mg, Zn, Fe, Pb and H_2 can displace Cu from $CuSO_4$ solution

50. 2 Only (ii) and (iii) are correct statements

MATHEMATICS

51. 3

$x + y + 26 = 60$

$x + y = 34$

$x^2 + y^2 = 26^2 = 676$

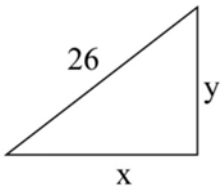
$\therefore (x + y)^2 = 34^2$

$x^2 + y^2 + 2xy = 1156$

$2xy = 1156 - 676$

$xy = 240$

$\text{Area} = \frac{1}{2}xy = 120$



52. 3 $P(x) = x^2 + 1$, then the remainder $P(-1) = (-1)^2 + 1 = 2$

SPACE FOR ROUGH WORK

53. 2 $P(x)=x^3+Kx^2-2Kx-K-6$

$P(-K)=-K^3+K^3+2K^2-K-6=0$

$\therefore 2K^2-K-6=0$

$2K^2-4K+3K-6=0$

$2K(K-2)+3(K-2)=0$

$(K-2)(2K+3)=0\Rightarrow K=2,\ \frac{-3}{2}\Rightarrow K=2$

54. 2 $t_n=a+(n-1)d$

$t_{19}=1+18\times 3=55$

55. 4 K is 0 or 5 and 7 + 1 + 5 + 2 + 1 + K = M(3),
When K = 0, sum of digits $\neq$ M(3); K=5 sum of digits = M(3)
$\Rightarrow$ K = 5

56. 2 $m^2-7m+1=0\Rightarrow m+\frac{1}{m}=7$

57. 4 $P(x)=(4x^2+5x+3)-(3x^2+2x+1)=x^2+3x+2$

58. 1 $\angle OBQ=\frac{1}{2}\angle AOQ=26°$

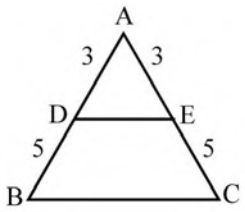
In ΔABT, $\angle OBQ+\angle ATQ=90°\Rightarrow ATQ=64°$

SPACE FOR ROUGH WORK

59. 2

$$\frac{AD}{DB}=\frac{AE}{EC}=\frac{3}{5}\Rightarrow\frac{AE+EC}{EC}=\frac{3+5}{5}$$

$$\therefore\frac{AC}{EC}=\frac{8}{5}\Rightarrow EC=\frac{AC\times5}{8}=\frac{16\times5}{8}=10$$



60. 3

In $\Delta PAC,\ \tan\alpha=\frac{80}{a};\ \tan\beta=\frac{20}{a}$

where, $\alpha=\angle ACP,\ \beta=\angle BCQ;$ Given $\alpha+\beta=90°;\beta=90-\alpha$

$\tan\beta=\tan(90-\alpha)=(0+\alpha)$

$\tan\alpha.\tan\beta=1$

$\frac{80}{a}.\frac{20}{a}=1\Rightarrow a^2=100;\ a=40$

Let $AD=x$ then $BD=40-x$

$\tan\angle ADP=\frac{80}{x}\ \tan\angle BDQ=\frac{20}{40-x}$

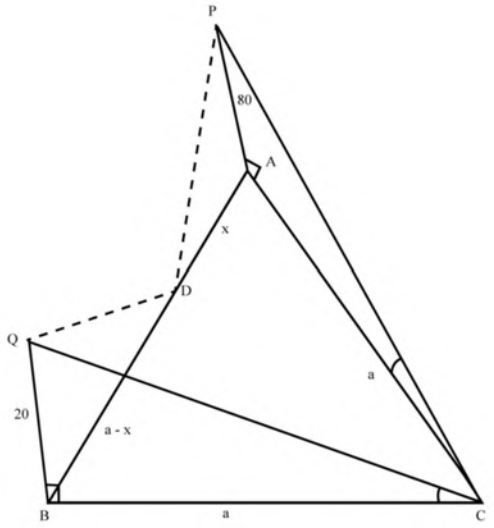
Given $\angle ADP=\angle BDQ\Rightarrow\frac{80}{x}=\frac{20}{40-x}$

$\Rightarrow 4(40-x)=x;\ 160-4x=x\Rightarrow 5x=160;x=32$

$\therefore AD=32,$ then $BD=40-32=8$

$\therefore AD.DB=32\times8=256$

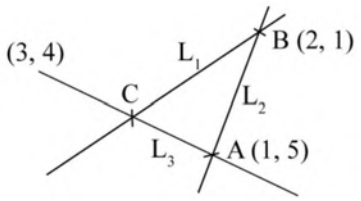
SPACE FOR ROUGH WORK



61. 4 $L_1 : 3x - y = 5;\ L_2 : 4x + y = 9;\ L_3 : x + 2y = 11$

Solving L_2 and L_3

$$\begin{array}{l} 8x + 2y = 18 \\ \underline{x + 2y = 11} \\ 7x \qquad \Rightarrow 7 \Rightarrow x = 1;\ y = 5 \Rightarrow A(1,5) \end{array}$$



Solving L_1 and L_3

SPACE FOR ROUGH WORK

$$6x - 2y = 10$$
$$x + 2y = 11$$
$$7x = 21 \Rightarrow x = 3 \text{ and } y = 4 \Rightarrow C(3,4)$$

Solving L_1 and L_2

$$3x - y = 5$$
$$4x + y = 9$$
$$7x = 14 \Rightarrow x = 2 \text{ and } y = 1 \Rightarrow B(2,1)$$

$A(1, 5) \Rightarrow a = 1; p = 5$
$B(2, 1) \Rightarrow b = 2; q = 1$
$C(3, 4) \Rightarrow c = 3; r = 4$

$$K = \frac{a^2 + b^2 + c^2}{p - 2q + r} = \frac{1^2 + 2^2 + 3^2}{5 - 2 + 4} = \frac{14}{7} = 2$$

$$\ell = \frac{a + b + c + 3}{p^2 - q^2} = \frac{1 + 2 + 3 + 3}{25 - 16} = \frac{9}{9} = 1$$

1) $7K + 3l = 14 + 3 = 17$ true
2) $5K - 6l = 10 - 6 = 4$ true
3) $3K + 2l = 6 + 2 = 8$ true
4) $4K + 3l = 8 + 3 = 11$ false

62. 1 $\angle P = \angle Q = \angle R = \frac{1}{2}\angle AOB = 51; \therefore \angle P + \angle Q + \angle R = 153°$

63. 3

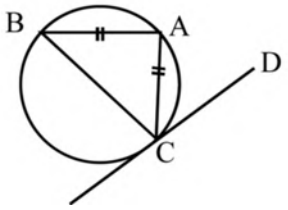
SPACE FOR ROUGH WORK

64. 4 Given $\angle ACD = 60°$

$\therefore \angle ABC = 60°$

$\therefore \angle ACB = 60°$ Since $AB = AC$

$\therefore \angle BAC = 60°$



65. 1 Here unit and tens places of each digit repeats 5 times
Therefore sum of all digits = 5(1 + 2+ 3+4+5) + 5(1 + 2 + 3 + 4 + 5) = 5 ×15 + 5×15
= 75 + 75 = 150

66. 12 $\left(2+\sqrt{2}\right)\left(2-\sqrt{2}\right)=4-2=2$

$\left(3+\sqrt{3}\right)\left(3-\sqrt{3}\right)=9-3=6$

$\therefore \left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)=2\times 6=12$

67. 114 $\left(76^2-24^2\right)+\left(56^2+44^2\right)+\left(75^2-25^2\right)=100\times 52+100\times 12+100\times 50$

$=100\left(52+12+50\right)=11400=100\ \text{K} \Rightarrow \text{K}=114$

68. 6 a–d + a + a + d = 18 $\Rightarrow$ 3a = 18, a = 6

69. 267 HCF = 3
LCM = 264, HCF + LCM = 3 + 264 = 267

70. 1 $\dfrac{x^2-4}{x-2} = x + 2$

71. 1 7x – y = 16 and 5x + y = 20
Solving x = 3 and y = 5; (x,y) = (3,5)

SPACE FOR ROUGH WORK

72. 17 $P(x) = 2x^3 + \lambda x^2 - 8x - 11$

$P(1) = 2 + \lambda - 8 - 11 = 0$

$\Rightarrow \lambda - 17 = 0 \Rightarrow \lambda = 17$

73. 10 $4a = 40 \Rightarrow a = 10$

Diameter of circle = diagonal of the square $= 10\sqrt{2} = K\sqrt{2} \Rightarrow K = 10$

74. 17 $2 + 3 + 5 + 7 = 17$

75. 12 $(x + 3)^2 - (x - 3)^2 = (x^2 + 6x + 9)(x^2 - 6x - 9) = 12x$

SPACE FOR ROUGH WORK

Brilliant STUDY CENTRE PALA

IIT/AIIMS - 2028 SCREENING TEST

QUESTION BOOKLET CODE

B

Date : 5th October 2025

IMPORTANT INSTRUCTIONS

Please read the instructions carefully

1. Do not break the seal of this question booklet before being instructed to do so by the invigilators
2. Please fill in all the details such as name, roll number and signature of the candidate in the columns given below.
3. The test is of **2 hour** duration.
   This question booklet contains 75 questions and **Maximum Mark is 240**
4. There are three Parts. Physics, Chemistry & Mathematics having 25 questions each. Each Part consists of two Sections. **In Section A** (15 questions) each question has four options (1), (2), (3) and (4). **Only one** of these four options is correct. Each correct answer will be awarded **FOUR** marks. **ONE** mark will be deducted for each incorrect answer.
5. **In Section B** (10 questions). **Out of these 10 questions candidate can choose to attempt any 5 questions.In the event of a candidate attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.** Each question has an answer which is a number with one/two/three digits. Each correct answer will be awarded **FOUR** marks. **NO NEGATIVE** mark for incorrect answer in Section B
6. Mark the bubble corresponding to the Answer in the Optical Response Sheet (ORS) by using either **Blue or Black ball - point pen only**
7. More than one answer marked against a question will be deemed as incorrect answer.
8. No negative mark for unattended Question.
9. Question paper booklet code is printed on the right hand top of this booklet
10. The paper CODE is printed on the right part of the ORS. Ensure that the code is identical and same as that on the question paper booklet. If not, contact the invigilator for change.
11. Handover the Answer sheet to the invigilator at the end of the examination

IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 75 QUESTIONS. IF NOT, REQUEST FOR REPLACEMENT

Name of the Candidate	Roll Number
I have read all the instructions and shall abide by them _ _ _ _ _ _ _ _ _ _ _ **Signature of the Candidate**	**I have verified all the information filled by the candidate** _ _ _ _ _ _ _ _ _ _ _ **Signature of the Invigilator**

SPACE FOR ROUGH WORK

PART I - PHYSICS

This part contains 25 questions

SECTION - A

Physics - Question No. - (1-15)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Physics - Question No. - (16 - 25)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

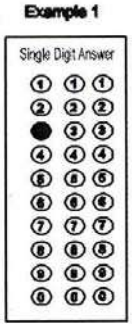
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

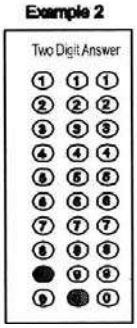
If Single Digit Answer

If answer is 3



If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180

SPACE FOR ROUGH WORK

SECTION A - PHYSICS

1. An electric fan is placed on a stationary boat and air is blown with it on the sail of the boat. Which of the following statement(s) is/are correct?

   1) The boat will remain stationary as before

   2) The boat will start moving with uniform speed

   3) The boat will be uniformly accelerated opposite to the direction of flow of air

   4) The boat will be uniformly accelerated in the direction of flow of air

2. When a satellite in a circular orbit around the earth enters the atmospheric region, it encounters small air resistance to its motion. Then

   1) Its kinetic energy decreases

   2) Its kinetic energy increases

   3) Its period of revolution around the earth increases

   4) Gravitational force on satellite decreases

SPACE FOR ROUGH WORK

3. A body is under the action of two equal and opposite forces, each of 3N. The body is displaced by 3m. The work done is

1) +9 J
2) –9 J
3) 18 J
4) 0

4. The radius of curvature of a convex mirror is 25cm. Calculate its focal length

1) 50 cm
2) 30 cm
3) 12.5 cm
4) 25 cm

5. The distance travelled by a body is directly proportional to time. Then the force acting on body will be:

1) 1N
2) 9.8 N
3) 98 N
4) 0 N

SPACE FOR ROUGH WORK

6. The frequency of a sound wave is 'n' and its velocity is 'v'. If the frequency is increased to 4n, the velocity of the wave will be

1) 2v

2) v

3) 4v

4) v/4

7. A candle flame 3 cm is placed at distance of 3m from a wall. How far from wall must a concave mirror be placed in order that it may form an image of flame 9 cm high on the wall

1) 225 cm

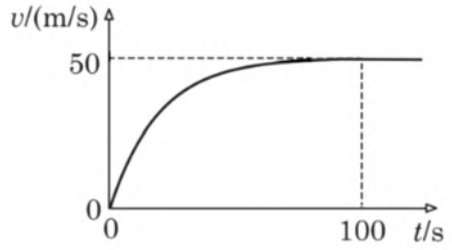
2) 300 cm

3) 650 cm

4) 450 cm

SPACE FOR ROUGH WORK

8. Two cars A and B simultaneously start a race. Velocity 'v' of the car A varies with time 't' according to the graph shown in the figure. It aquires a velocity 50 m/s few seconds before t = 100 s and thereafter moves with this speed. Car B runs together with car A till both acquire a velocity 20 m/s; after this, car B moves with zero acceleration for one second and then follows velocity-time profile identical to that of A with a delay of one second. In this way, car B acquires the velocity 50 m/s one second after A acquires it. How much more distance Δs in in meter does the car A cover in the first 100 s as compared to the car B?



1) $\Delta s = 20$ m

2) $\Delta s < 30$ m

3) $\Delta s = 30$ m

4) Insufficient information

SPACE FOR ROUGH WORK

9. If the acceleration due to gravity is 10 ms^{-2} and the units of length and time are changed in kilometre and hour, respectively, the numerical value of the acceleration is

1) 129,600

2) 72,000

3) 36,000

4) 360,000

10. Which of the following statements is NOT true?

1) Displacement has specific direction

2) Displacement has no specific direction

3) Displacement of a body can be zero

4) Magnitude of displacement is equal or less than the distance travelled

SPACE FOR ROUGH WORK

11. Splitting of light into its colours is called:-

1) Scattering

2) Refraction

3) Dispersion

4) Reflection

12. A student has 10 resistors of resistance 'r' each. The minimum resistance made by him from given resistors is:

1) 10 r

2) $\frac{r}{100}$

3) $\frac{r}{10}$

4) $\frac{r}{5}$

SPACE FOR ROUGH WORK

13. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is

1) towards south
2) towards north
3) towards east
4) towards west

14. The value of g on earth surfae is 9.8 m/s^2 then the value of g at earth's centre in m/s^2 is

1) 9.8
2) 19.6
3) 4.9
4) zero

15. The electrical appliances in a house are connected in:

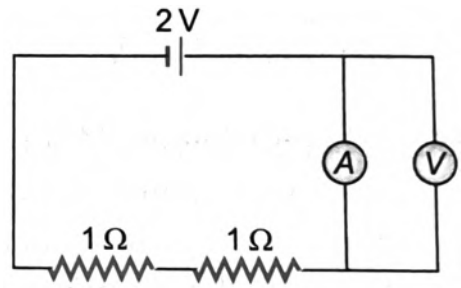
1) Series
2) Either in series or parallel
3) Parallel
4) Both in series and parallel

SPACE FOR ROUGH WORK

SECTION B - PHYSICS

16. The force acting on a particle of mass 2kg is 50 N. The acceleration of the particle in m/s^2 is

17. In the circuit shown, A and V are ideal ammeter and voltmeter respectively. Reading of the voltmeter in volt will be :



18. A mass of 5kg is taken to a depth of 2m. Work done by gravity in joule is [$g = 10\ m/s^2$]

19. 50C of charge flown through a circuit in 10 second. The current flowing through the circuit in ampere is

SPACE FOR ROUGH WORK

20. Weight of an object at the surface of the earth is 60 N. The mass of the object at the surface of the moon in kg is [$g_{earth} = 10 m/s^2$]

21. Two resistors 4Ω and 6Ω are connected in series. The effective resistance in ohm is

22. The force acting on a particle is 5N. The velocity of the particle at an instant is 10 m/s. The power at the instant in W is

23. When a particle is moving with a constant velocity, its acceleration in m/s^2 is

24. A man standing on a cliff claps his hand hears its echo after 1s. If found is reflected from mountain and velocity of sound in air is 340 ms^{-1}. Then the distance between the man and reflection point in meter is

25. A convex lens of focal length 10 cm produces an image which is having same size as that of the object. The magnitude of object distance from the lens in cm is

SPACE FOR ROUGH WORK

PART II - CHEMISTRY

This part contains 25 questions

SECTION - A

Chemistry - Question No. - (26-40)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Chemistry Question No. - (41 - 50)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

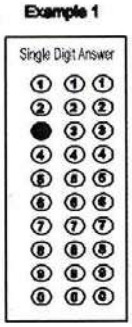
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

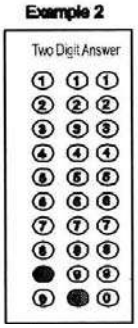
If Single Digit Answer

If answer is 3



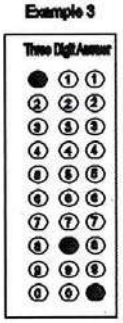
If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180



SECTION A - CHEMISTRY

26. The reaction commonly used in the hydrogenation of vegetable oils using a catalyst belongs to

1) Substitution reaction

2) Oxidation reaction

3) Combustion reaction

4) Addition reaction

27. The liquid non-metal at room temperature (298 K) is

1) Bromine

2) Mercury

3) Phosphorus

4) Chlorine

SPACE FOR ROUGH WORK

28. Given below are two statements, one is labelled as Asserion (A) and the other is labelled as Reason (R).

Assertion (A) : Hydrogen gas is evolved when zinc (Zn) metal react with dilute hydrochloric acid

Reason (R) : all metals displaces hydrogen from dilute hydrochloric acid

In the light of the above statemetns select the most appropriate answer from options given below

1) Both A and R are correct and R is the correct explanation of A

2) Both A and R are correct and R is not the correct explanation of A

3) R is correct but A is false

4) A is correct but R is false

29. On treating with aqueous sodium hydroxide which is an alkali, ester is converted into to alcohol and sodium salt of carboxylic acid. This reaction is known as

1) Esterification 2) Neutralisation 3) Dehydration 4) Saponification

SPACE FOR ROUGH WORK

30. The correct set of co-efficients x, y, z and w for the balanced chemical equation

$xNH_{3(g)} + yO_{2(g)} \longrightarrow zNO_{(g)} + wH_2O_{(g)}$ is

1) x = 4; y = 5; z = 4; w = 6

2) x = 5; y = 4; z = 5; w = 6

3) x = 4; y = 6; z = 4; w = 7

4) x = 4; y = 6; z = 4; w = 5

31. An element X reacts with dilute H_2SO_4 as well as with NaOH to produce salt and $H_2(g)$. Hence, it may be concluded that

I) X is an electropositive element

II) Oxide of X is basic in nature

III) Oxide of X is acidic in nature

IV) X is an electronegative element

1) IV, I, III 2) I, II, III 3) III, IV, I 4) II, III, IV

32. Butanone is a four carbon compound with the functional group of which class of compounds among the following?

1) Carboxylic acid 2) Aldehyde 3) Ketone 4) Alcohol

SPACE FOR ROUGH WORK

33. In which among the following electrovalent compounds both cation and anion posses the same inert gas configuration?

1) Sodium oxide (Na_2O)
2) Sodium chloride (NaCl)
3) Magnesium chloride ($MgCl_2$)
4) Calcium fluoride (CaF_2)

34. Which statement among the following is incorrect?

1) 22 carat gold is an alloy. It is gold alloyed with either silver or copper

2) Brass an alloy of copper and zinc (Cu and Zn) is not a good conductor of electricity

3) Cinnabar an alloy of mercury and sulphur (Hg and S) is an amalgam

4) Solder an alloy of lead and tin (Pb and Sn) has low melting point

35. The element among the following which has two electrons in the outer most shell is

1) Sodium (Na)
2) Magnesium (Mg)
3) Oxygen (O)
4) Fluorine (F)

36. ${}^{x}_{y}A$ and ${}^{p}_{q}B$ are isotopes. Which equation among the following is correct regarding the isotopes?

1) $(x^2 + p^2)(y^2 + q^2) = 0$
2) $(x^2 - p^2)(y^2 - q^2) = 0$
3) $(x^2 - q^2)(y^2 - p^2) = 0$
4) $(x^2 + q^2)(y^2 + q^2) = 0$

SPACE FOR ROUGH WORK

37. The formula of compound formed between two elements (A) and (B) having atomic numbers 1 and 17 respectively, is

1) AB_2 2) AB 3) A_2B_3 4) A_3B_2

38. Four substances were thoroughly mixed with water separately to obtain mixtures A, B, C and D. Some of their properties are given below:

I) Path of a beam of light passing through it was visible in A, B and D but invisible in C

II) On leaving undisturbed, the particles of the substance settle down in A but not in B, C and D

III) The solute particles are visible to naked eye in a but invisible in B, C and D

Which of the following is correct about A, B, C and D?

1) A, B and D are colloids, C is a solution

2) A is a colloid, B, C and D are solutions

3) A is a suspension, B and D are colloids, C is a solution

4) A is a suspension, B, C and D are colloids

39. The smallest particle of an element or a compound that shows all the properties of the substance and have free existence is a/an

1) radical 2) molecule 3) atom 4) ion

SPACE FOR ROUGH WORK

40. Match **List-I** with **List-II.**

List-I (reaction)		List-II (Type of reaction)	
i)	A compound breaks apart into elements	p)	Combination
ii)	A metal and non metal react to form an ionic compound	q)	Decomposition
iii)	A compound of hydrogen and carbon react with oxygen to produce carbon dioxide and water	r)	Displacement
iv)	Silver ion from $AgNO_{3(aq)}$ forms precipitate with bromide ions from $KBr_{(aq)}$	s)	Double displacement
		t)	Combustion

Choose the most appropriate answer from the options given below

1) (i) - q; (ii) - p; (iii) - r; (iv) - s

2) (i) - s; (ii) - r; (iii) - q; (iv) - p

3) (i) - q; (ii) - p; (iii) - t; (iv) - s

4) (i) - q; (ii) - t; (iii) - q; (iv) - r

SECTION B - CHEMISTRY

41. Consider the binary compounds CO, NO, Na_2O, CaO, H_2O, ZnO, CO_2, NO_2, Al_2O_3 and CuO. The number of compounds among these that are neither basic nor amphoteric are .....

SPACE FOR ROUGH WORK

42. How many of the following are gases at 1 atmosphere prsent and 300 K temperature?

i) Carbon dioxide (CO_2) , ii) Diamond ($C_{diamond}$), iii) Gold (Au), iv) Nitrogen (N_2), (v) Silver (Ag), (vi) Oxygen (O_2)

43. Number of atoms in one formula unit of washing soda is 'x' and number of atoms in one formula unit of bakingsoda is 'y'. Give the value of $(x \times y)$

44. How many of the following can displace copper from aqueous copper sulphate?

i) Magnesium (Mg) ii) Gold (Au) iii) Iron (Fe) iv) Hydrogen gas (H_2)

v) Mercury (Hg) vi) Lead (Pb) vii) Silver (Ag) viii) Zinc (Zn)

45. How many of the following statement(s) is/are correct?

i) Sodium and potassium catch fire if kept in open. Hence to protect them and prevent accidental fires they are kept immersed in water

ii) At ordinary temperature the surface of metals such as magnesium (Mg), Aluminium (Al), Zinc (Zn) and Lead (Pb) are covered with a thin layer of oxide

iii) Iron does not burn on heating

iv) Copper burn vigorously on heating

v) Silver and copper do not react with oxygen even at high temperature

SPACE FOR ROUGH WORK

46. Formula unit mass is calculated the same way as molecular mass is calculated. The formula unit mass of Aluminium sulphate is ..... u (Given : Atomic mass of H = 1u, N = 14 u, O = 16u, S = 32u, Al = 27u, Na = 23u)

47. How many of the following are organic compounds?

i) Ammonium cyanate ii) Fullerene iii) Acetic acid

iv) Sodiumbicarbonate v) Urea vi) Carbonic acid

48. Number of atoms present in a molecule of hydrogen is .....

49. The number of electrons present in the outermost shell of Neon (Atomic number = 10) is .....

50. For how many of the following substances pH is equal to or more than 7 at 298 K?

i) Gastric juice ii) Blood iii) Aqueous sodium hydroxide

iv) Pure water v) Milk of magnesia vi) Lemon juice

SPACE FOR ROUGH WORK

PART III - MATHEMATICS

This part contains 25 questions

SECTION - A

Mathematics - Question No. - (51-65)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Mathematics - Question No. - (66 - 75)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

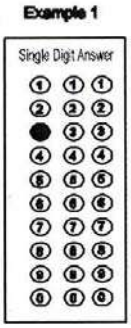
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

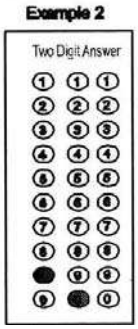
If Single Digit Answer

If answer is 3



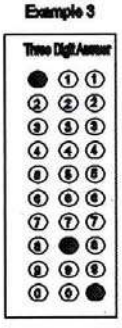
If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180



SECTION A - MATHEMATICS

51. A six digit number 71521K is divisible by 3 and 5 then K is

1) 5 2) 0

3) 3 4) 2

52. If $m^2 - 7m + 1 = 0$ then $m + \frac{1}{m}$ is

1) 5 2) 3

3) 7 4) 1

53. Which rational expression should be added with $3x^2 + 2x + 1$ to get $4x^2 + 5x + 3$?

1) $x^2 + 3x + 2$

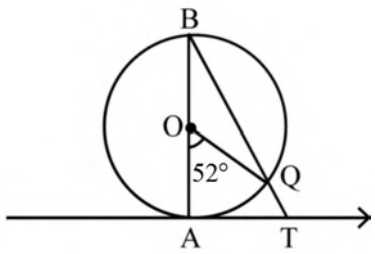
2) $x^2 - 3x + 2$

3) $x^2 - 3x - 2$

4) $x^2 + 3x - 2$

SPACE FOR ROUGH WORK

54. In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 52°$, then the degree measure of $\angle ATQ$ is .....



1) 46°

2) 64°

3) 56°

4) 65°

55. $6\sin 30° + 2\cos 30°$ is

1) $1+3\sqrt{3}$

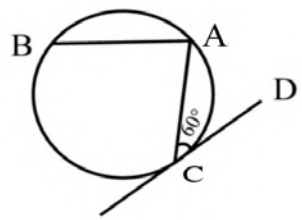
2) $2+3\sqrt{3}$

3) $3+2\sqrt{3}$

4) $3+\sqrt{3}$

SPACE FOR ROUGH WORK

56. In the figure AB = AC and $\overline{CD}$ is a tangent at C. If $\angle ACD = 60°$, then $\angle BAC$ is



1) 60° 2) 55° 3) 65° 4) 50°

57. N_i is a two digit number formed by the digits 1, 2, 3, 4 and 5, with repetition is allowed, that is $N_1 = 11$ and $N_{25} = 55$. Let $S(N_i)$ denote the sum of the digits of N_i. Then $S(N_1) + S(N_2) + ... + S(N_{25})$ is

1) 175 2) 150 3) 200 4) 225

58. The hypotenuse of a right triangle is 26 cm and its perimeter is 60 cm. Then area of the triangle is

1) 128 cm^2 2) 180 cm^2 3) 182 cm^2 4) 120 cm^2

SPACE FOR ROUGH WORK

59. What is the remainder, when $x^2 + 1$ is divided by $x + 1$?

1) 0 2) 1

3) 3 4) 2

60. If $x + k$ is a factor of $x^3 + kx^2 - 2kx - k - 6$, then positive value of k is

1) 1 2) 3

3) 2 4) $\frac{3}{2}$

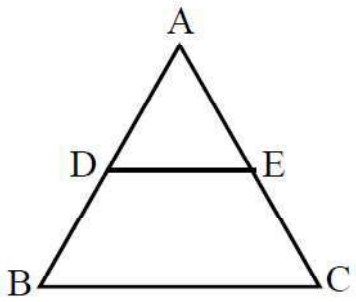
61. 19^{th} term of the sequence 1, 4, 7, 10 ..... is

1) 54 2) 56

3) 55 4) 57

SPACE FOR ROUGH WORK

62. From the adjacent figure of triangle ABC, DE||BC and $\frac{AD}{DB}=\frac{3}{5}$. If AC = 16, then EC is



1) 12 2) 11 3) 10 4) 14

63. A field ABC is in the form an equilateral triangle. There are two pillers AP of height 80m and BQ of height 20m are placed at two corner of the field ABC at A and B. If is given that $\angle ACP$ and $\angle BCQ$ are complementary to each other $(\text{ie, } \angle ACP+\angle BCQ=90°)$. If D be a point on AB, so that $\angle BDQ$ is equal to $\angle ADP$. Then AD × DB is

1) 144 2) 216 3) 284 4) 256

SPACE FOR ROUGH WORK

64. Equations of three straight lines are given below $L_1 : 3x - y = 5$, $L_2 : 4x + y = 9$ and $L_3 : x + 2y - 11 = 0$. The lines L_2, L_3 intersect at A (a, p); L_1, L_2 intersect at B(b, q) and L_3, L_1 intersect at C(c, r). If $k = \frac{a^2 + b^2 + c^2}{p - 2q + r}$ and $l = \frac{a + b + c + 3}{p^2 - r^2}$ then which of the following is not TRUE?

1) $4k + 3l = 10$ 2) $5k - 6l = 4$

3) $3k + 2l = 8$ 4) $7k + 3l = 17$

65. In the figure O is centre of the circle and $\angle AOB = 102°$. Then $\angle P + \angle Q + \angle R$ is

1) 183° 2) 153° 3) 165° 4) 200°

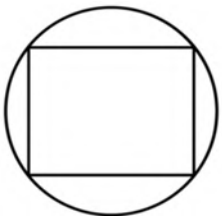
SPACE FOR ROUGH WORK

SECTION B - MATHEMATICS

66. Sum of LCM and HCF of 24 and 33 is

67. Coefficient of x in the expression $\frac{x^2-4}{x-2}$ is

68. A circle is circumscribed a square of perimeter 40 cm as in the following figure. If diameter of the circle is $k\sqrt{2}$, then k is



69. Sum of all prime numbers less than 10 is

70. Coefficient of x in $(x+3)^2-(x-3)^2$ is

SPACE FOR ROUGH WORK

71. Value of $\left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)$ is

72. If $76^2 + 56^2 + 75^2 - 44^2 - 25^2 - 24^2 = 100K$, then the value of K is

73. If sum of three consecutive terms of an arithmetic progression is 18. Then the middle term is

74. The number of ordered pair (x,y) satisfy the equations $7x - y = 16$ and $5x + y = 20$, is

75. If $x - 1$ is a factor of $2x^3 + \lambda x^2 - 8x - 11 = 0$, then the value of '$\lambda$' is

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

IIT/AIIMS SCREENING TEST - 05-10-2025

QUESTION BOOKLET CODE

B

P + C + M - ANSWER KEY

PHYSICS

1. 1 $F_{net} = 0$. So the boat remain stationary
2. 2 The air resistance reduce the speed of satellite that unbalance the gravitational and centripetal forces. This cause the body to accelerate downward because gravitation force become greater than centripetal force. The velocity downward increase and velocity on sidewise decrease. Since gravitational force is greater than resistance. Its net velocity (speed) will increase so its KE increase.
3. 4 $F_{net} = 0$, $W = F_{net}.d = 0$
4. 3 $f = R/2 = \frac{25}{2} = 12.5$
5. 4
6. 2 Velocity of sound doesnot depend on frequency
7. 4 $m = \frac{-V}{u}; \frac{-9}{3} = \frac{(3+x)}{x}$

   $3x = 3x;\ x = \frac{3}{2} = 150$ cm

   Distance from wall to mirror = 3 + x = 300 + 150 = 450 cm
8. 3 $\Delta s = (50 - 20) = 30$
9. 1 $g = 10\frac{m}{s^2} = \frac{10\times(10^{-3}\text{km})}{\left(\frac{1}{3600}\text{h}\right)} = 10\times3600\times3600\times10^{-3}\text{kmh}^{-2}$

   Therefore, $g = 129600$ kmh^{-2}
10. 2 Displacement is a vector quantity so it has a definite direction
11. 3 The phenomenon of splitting the light is called dispersion of light
12. 3 Minimum when all connected in parallel $R = \frac{r}{10}$
13. 2 Using right hand rule
14. 4 At earth centre $F_G = 0 \Rightarrow$ = 0
15. 3 To get equal voltage appliances are connected in parallel

16. 25 $a = \frac{F}{m} = \frac{50}{20} = 25$

17. 0 Resistance across ideal ammeter = 0

18. 100 $Wg = Fg \times d = mg \times 2 = 5 \times 10 \times 2 = 100$

19. 5 $I = \frac{q}{t} = \frac{50}{10} = 5 \text{ sec}$

20. 6 $g_{moon} = g_{earth}/6$

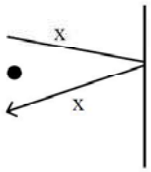
$60 = m \times 10;\ m = 6 \text{ kg}$

21. 10 In series combination $R = R_1 + R_2 = 4 + 6 = 10\Omega$

22. 50 $P = F.V = 5 \times 10 = 50$

23. 0

24. 170 Sound travel 2x distance where x is the distance between man and cliff



$V = d/t \Rightarrow 340 = \frac{2x}{1} \Rightarrow 2x = 340;\ x = 170$

25. 20 Image and object is same size when object is at 2F. $2 \times 10 = 20$

SPACE FOR ROUGH WORK

CHEMISTRY

26. 4 Hydrogenation of vegetable oils is addition reaction
27. 1 Bromine is liquid at 298 K
28. 4 Assertion is correct but reason is wrong
29. 4 Alkali catalysed hydrolysis of ester is called saponification
30. 1 The balanced chemical equation is $4NH_{3(g)} + 5O_{2(g)} \longrightarrow 4NO_{(g)} + 6H_2O_{(g)}$
31. 2 X is amphoteric in nature and electropositive
32. 3 Butanone ie $CH_3COCH_2CH_3$ is a ketone
33. 1
34. 3 Cinnabar (HgS) is an ore of mercury
35. 2 E.C. of $_{12}Mg$ is 2, 8, 2
36. 2 $^{x}_{y}A$ and $^{p}_{q}B$ are isotopes ; y = q since atomic number is the same
37. 2 The compound is HCl.
38. 3 A is suspension as particles are visible to naked eye and settle down
    C is solution as beam of light is invisible in it
    B and D are colloids as particles are invisible and beam of light visible.
39. 2 Definition of molecule
40. 3 (i) decomposition (ii) Combination (iii) Combustion (iv) Double displacement
41. 5 CO_2 and NO_2 are acidic. CO, NO and H_2O are neutral
42. 3 N_2, O_2 and CO_2 are gases diamond, Au and Ag are solids.

SPACE FOR ROUGH WORK

43. 216 Washing soda is $Na_2CO_3.10H_2O$
x = 36
Baking soda is $NaHCO_3$
y = 6

44. 5 Mg, Zn, Fe, Pb and H_2 can displace Cu from $CuSO_4$ solution

45. 2 Only (ii) and (iii) are correct statements

46. 342 Aluminium sulphate is $Al_2(SO_4)_3$

47. 2 Acetic acid and urea are organic compounds

48. 2 Hydrogen molecule is H_2

49. 8 E.C. of $_{10}Ne$ is 2, 8

50. 4 Milk of magnesia, pure water, blood, NaOH (aq)

MATHEMATICS

51. 1 K is 0 or 5 and 7 + 1 + 5 + 2 + 1 + K = M(3),
When K = 0, sum of digits $\neq$ M(3); K=5 sum of digits = M(3)
$\Rightarrow$ K = 5

52. 3 $m^2 - 7m + 1 = 0 \Rightarrow m + \frac{1}{m} = 7$

53. 1 $P(x) = \left(4x^2 + 5x + 3\right) - \left(3x^2 + 2x + 1\right) = x^2 + 3x + 2$

54. 2 $\angle OBQ = \frac{1}{2}\angle AOQ = 26°$
In ΔABT, $\angle OBQ + \angle ATQ = 90° \Rightarrow ATQ = 64°$

55. 4

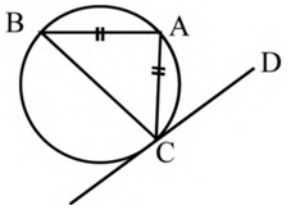
SPACE FOR ROUGH WORK

56. 1 Given $\angle ACD = 60°$

$\therefore \angle ABC = 60°$

$\therefore \angle ACB = 60°$ Since $AB = AC$

$\therefore \angle BAC = 60°$



57. 2 Here unit and tens places of each digit repeats 5 times

Therefore sum of all digits = $5(1 + 2+ 3+4+5) + 5(1 + 2 + 3 + 4 + 5) = 5 \times 15 + 5 \times 15$

$= 75 + 75 = 150$

58. 4 $x + y + 26 = 60$

$x + y = 34$

$x^2 + y^2 = 26^2 = 676$

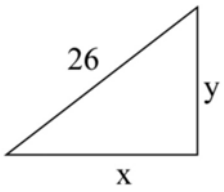
$\therefore (x + y)^2 = 34^2$

$x^2 + y^2 + 2xy = 1156$

$2xy = 1156 - 676$

$xy = 240$

$\text{Area} = \frac{1}{2}xy = 120$



59. 4 $P(x) = x^2 + 1$, then the remainder $P(-1) = (-1)^2 + 1 = 2$

SPACE FOR ROUGH WORK

60. 3 $P(x)=x^3+Kx^2-2Kx-K-6$

$P(-K)=-K^3+K^3+2K^2-K-6=0$

$\therefore 2K^2-K-6=0$

$2K^2-4K+3K-6=0$

$2K(K-2)+3(K-2)=0$

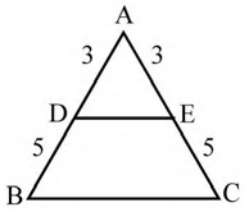
$(K-2)(2K+3)=0\Rightarrow K=2,\ \frac{-3}{2}\Rightarrow K=2$

61. 3 $t_n=a+(n-1)d$

$t_{19}=1+18\times 3=55$

62. 3 $\frac{AD}{DB}=\frac{AE}{EC}=\frac{3}{5}\Rightarrow\frac{AE+EC}{EC}=\frac{3+5}{5}$

$\therefore \frac{AC}{EC}=\frac{8}{5}\Rightarrow EC=\frac{AC\times 5}{8}=\frac{16\times 5}{8}=10$



63. 4

SPACE FOR ROUGH WORK

In ΔPAC, $\tan\alpha = \frac{80}{a}$; $\tan\beta = \frac{20}{a}$

where, $\alpha = \angle ACP$, $\beta = \angle BCQ$; Given $\alpha + \beta = 90°; \beta = 90 - \alpha$

$\tan\beta = \tan(90 - \alpha) = (0 + \alpha)$

$\tan\alpha . \tan\beta = 1$

$\frac{80}{a} . \frac{20}{a} = 1 \Rightarrow a^2 = 100;\ a = 40$

Let $AD = x$ then $BD = 40 - x$

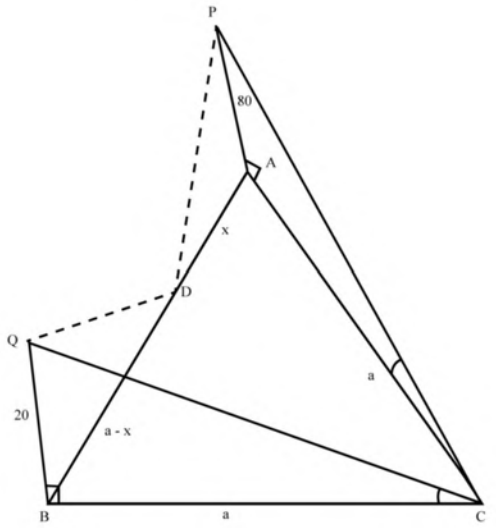
$\tan\angle ADP = \frac{80}{x}$ $\tan\angle BDQ = \frac{20}{40 - x}$

Given $\angle ADP = \angle BDQ \Rightarrow \frac{80}{x} = \frac{20}{40 - x}$

$\Rightarrow 4(40 - x) = x;\ 160 - 4x = x \Rightarrow 5x = 160; x = 32$

$\therefore$ $AD = 32$, then $BD = 40 - 32 = 8$

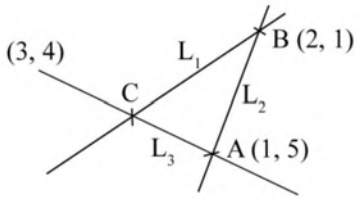
$\therefore$ $AD.DB = 32 \times 8 = 256$



SPACE FOR ROUGH WORK

64. 1 $L_1 : 3x - y = 5;\ L_2 : 4x + y = 9;\ L_3 : x + 2y = 11$

Solving L_2 and L_3



$$8x + 2y = 18$$
$$x + 2y = 11$$
$$7x \quad \Rightarrow 7 \Rightarrow x = 1;\ y = 5 \Rightarrow A(1,5)$$

Solving L_1 and L_3

$$6x - 2y = 10$$
$$x + 2y = 11$$
$$7x = 21 \Rightarrow x = 3 \text{ and } y = 4 \Rightarrow C(3,4)$$

Solving L_1 and L_2

$$3x - y = 5$$
$$4x + y = 9$$
$$7x = 14 \Rightarrow x = 2 \text{ and } y = 1 \Rightarrow B(2,1)$$

$A(1, 5) \Rightarrow a = 1;\ p = 5$
$B(2, 1) \Rightarrow b = 2;\ q = 1$
$C(3, 4) \Rightarrow c = 3;\ r = 4$

SPACE FOR ROUGH WORK

$$K = \frac{a^2 + b^2 + c^2}{p - 2q + r} = \frac{1^2 + 2^2 + 3^2}{5 - 2 + 4} = \frac{14}{7} = 2$$

$$\ell = \frac{a + b + c + 3}{p^2 - q^2} = \frac{1 + 2 + 3 + 3}{25 - 16} = \frac{9}{9} = 1$$

1) $7K + 3l = 14 + 3 = 17$ true
2) $5K - 6l = 10 - 6 = 4$ true
3) $3K + 2l = 6 + 2 = 8$ true
4) $4K + 3l = 8 + 3 = 11$ false

65. 2 $\angle P = \angle Q = \angle R = \frac{1}{2}\angle AOB = 51; \therefore \angle P + \angle Q + \angle R = 153°$

66. 267 HCF = 3
LCM = 264, HCF + LCM = 3 + 264 = 267

67. 1 $\frac{x^2 - 4}{x - 2} = x + 2$

68. 10 $4a = 40 \Rightarrow a = 10$
Diameter of circle = diagonal of the square $= 10\sqrt{2} = K\sqrt{2} \Rightarrow K = 10$

69. 17 2 + 3 + 5 + 7 = 17

70. 12 $(x + 3)^2 - (x - 3)^2 = (x^2 + 6x + 9)(x^2 - 6x - 9) = 12x$

SPACE FOR ROUGH WORK

71. 12 $\left(2+\sqrt{2}\right)\left(2-\sqrt{2}\right)=4-2=2$

$\left(3+\sqrt{3}\right)\left(3-\sqrt{3}\right)=9-3=6$

$\therefore \left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)=2\times 6=12$

72. 114 $\left(76^2-24^2\right)+\left(56^2+44^2\right)+\left(75^2-25^2\right)=100\times 52+100\times 12+100\times 50$

$=100\left(52+12+50\right)=11400=100\ \text{K}\Rightarrow \text{K}=114$

73. 6 a–d + a + a + d = 18 $\Rightarrow$ 3a = 18, a = 6

74. 1 7x – y = 16 and 5x + y = 20

Solving x = 3 and y = 5; (x,y) = (3,5)

75. 17 $P(x)=2x^3+\lambda x^2-8x-11$

$P(1)=2+\lambda-8-11=0$

$\Rightarrow \lambda-17=0\Rightarrow \lambda=17$

SPACE FOR ROUGH WORK

Brilliant STUDY CENTRE PALA

IIT/AIIMS - 2028 SCREENING TEST

QUESTION BOOKLET CODE

C

Date : 5th October 2025

IMPORTANT INSTRUCTIONS

Please read the instructions carefully

1. Do not break the seal of this question booklet before being instructed to do so by the invigilators
2. Please fill in all the details such as name, roll number and signature of the candidate in the columns given below.
3. The test is of **2 hour** duration.
   This question booklet contains 75 questions and **Maximum Mark is 240**
4. There are three Parts. Physics, Chemistry & Mathematics having 25 questions each. Each Part consists of two Sections. **In Section A** (15 questions) each question has four options (1), (2), (3) and (4). **Only one** of these four options is correct. Each correct answer will be awarded **FOUR** marks. **ONE** mark will be deducted for each incorrect answer.
5. **In Section B** (10 questions). **Out of these 10 questions candidate can choose to attempt any 5 questions.In the event of a candidate attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.** Each question has an answer which is a number with one/two/three digits. Each correct answer will be awarded **FOUR** marks. **NO NEGATIVE** mark for incorrect answer in Section B
6. Mark the bubble corresponding to the Answer in the Optical Response Sheet (ORS) by using either **Blue or Black ball - point pen only**
7. More than one answer marked against a question will be deemed as incorrect answer.
8. No negative mark for unattended Question.
9. Question paper booklet code is printed on the right hand top of this booklet
10. The paper CODE is printed on the right part of the ORS. Ensure that the code is identical and same as that on the question paper booklet. If not, contact the invigilator for change.
11. Handover the Answer sheet to the invigilator at the end of the examination

IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 75 QUESTIONS. IF NOT, REQUEST FOR REPLACEMENT

Name of the Candidate	Roll Number
I have read all the instructions and shall abide by them _ _ _ _ _ _ _ _ _ _ _ **Signature of the Candidate**	**I have verified all the information filled by the candidate** _ _ _ _ _ _ _ _ _ _ _ **Signature of the Invigilator**

SPACE FOR ROUGH WORK

PART I - PHYSICS

This part contains 25 questions

SECTION - A

Physics - Question No. - (1-15)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Physics - Question No. - (16 - 25)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

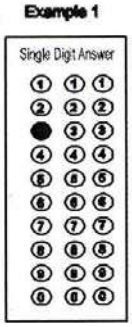
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

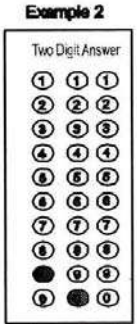
If Single Digit Answer

If answer is 3



If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180

SPACE FOR ROUGH WORK

SECTION A - PHYSICS

1. A student has 10 resistors of resistance 'r' each. The minimum resistance made by him from given resistors is:

   1) 10 r

   2) $\frac{r}{5}$

   3) $\frac{r}{100}$

   4) $\frac{r}{10}$

2. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is

   1) towards east

   2) towards south

   3) towards north

   4) towards west

SPACE FOR ROUGH WORK

3. The value of g on earth surfae is 9.8 m/s^2 then the value of g at earth's centre in m/s^2 is

1) 9.8

2) 19.6

3) 4.9

4) zero

4. The electrical appliances in a house are connected in:

1) Series

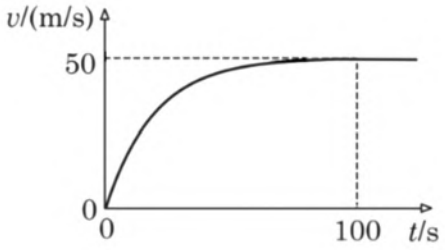
2) Parallel

3) Either in series or parallel

4) Both in series and parallel

SPACE FOR ROUGH WORK

5. Two cars A and B simultaneously start a race. Velocity 'v' of the car A varies with time 't' according to the graph shown in the figure. It aquires a velocity 50 m/s few seconds before t = 100 s and thereafter moves with this speed. Car B runs together with car A till both acquire a velocity 20 m/s; after this, car B moves with zero acceleration for one second and then follows velocity-time profile identical to that of A with a delay of one second. In this way, car B acquires the velocity 50 m/s one second after A acquires it. How much more distance Δs in in meter does the car A cover in the first 100 s as compared to the car B?



1) $\Delta s = 30$ m

2) $\Delta s < 30$ m

3) $\Delta s = 20$ m

4) Insufficient information

SPACE FOR ROUGH WORK

6. If the acceleration due to gravity is 10 ms^{-2} and the units of length and time are changed in kilometre and hour, respectively, the numerical value of the acceleration is

1) 360,000

2) 129,600

3) 36,000

4) 72,000

7. Which of the following statements is NOT true?

1) Displacement of a body can be zero

2) Displacement has specific direction

3) Displacement has no specific direction

4) Magnitude of displacement is equal or less than the distance travelled

SPACE FOR ROUGH WORK

8. Splitting of light into its colours is called:-

1) Scattering

2) Reflection

3) Refraction

4) Dispersion

9. The distance travelled by a body is directly proportional to time. Then the force acting on body will be:

1) 0 N

2) 9.8 N

3) 1N

4) 98 N

SPACE FOR ROUGH WORK

10. The frequency of a sound wave is 'n' and its velocity is 'v'. If the frequency is increased to 4n, the velocity of the wave will be

1) 4v 2) 2v 3) v 4) v/4

11. A candle flame 3 cm is placed at distance of 3m from a wall. How far from wall must a concave mirror be placed in order that it may form an image of flame 9 cm high on the wall

1) 450 cm 2) 300 cm 3) 225 cm 4) 650 cm

12. An electric fan is placed on a stationary boat and air is blown with it on the sail of the boat. Which of the following statement(s) is/are correct?

1) The boat will be uniformly accelerated in the direction of flow of air

2) The boat will remain stationary as before

3) The boat will be uniformly accelerated opposite to the direction of flow of air

4) The boat will start moving with uniform speed

SPACE FOR ROUGH WORK

13. When a satellite in a circular orbit around the earth enters the atmospheric region, it encounters small air resistance to its motion. Then

1) Its period of revolution around the earth increases

2) Its kinetic energy decreases

3) Its kinetic energy increases

4) Gravitational force on satellite decreases

14. A body is under the action of two equal and opposite forces, each of 3N. The body is displaced by 3m. The work done is

1) 0 2) –9 J 3) +9 J 4) 18 J

15. The radius of curvature of a convex mirror is 25cm. Calculate its focal length

1) 50 cm 2) 25 cm 3) 30 cm 4) 12.5 cm

SPACE FOR ROUGH WORK

SECTION B - PHYSICS

16. A man standing on a cliff claps his hand hears its echo after 1s. If found is reflected from mountain and velocity of sound in air is 340 ms^{-1}. Then the distance between the man and reflection point in meter is

17. A convex lens of focal length 10 cm produces an image which is having same size as that of the object. The magnitude of object distance from the lens in cm is

18. Two resistors 4Ω and 6Ω are connected in series. The effective resistance in ohm is

19. The force acting on a particle is 5N. The velocity of the particle at an instant is 10 m/s. The power at the instant in W is

20. When a particle is moving with a constant velocity, its acceleration in m/s^2 is

21. A mass of 5kg is taken to a depth of 2m. Work done by gravity in joule is [$g = 10\ m/s^2$]

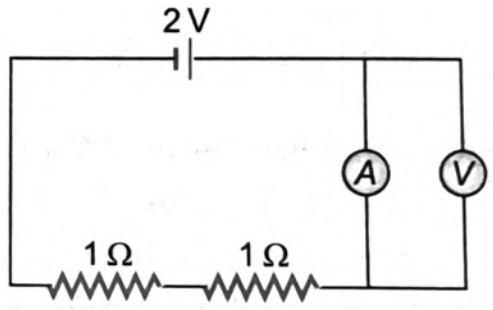
SPACE FOR ROUGH WORK

22. 50C of charge flown through a circuit in 10 second. The current flowing through the circuit in ampere is

23. Weight of an object at the surface of the earth is 60 N. The mass of the object at the surface of the moon in kg is [$g_{earth} = 10 m/s^2$]

24. The force acting on a particle of mass 2kg is 50 N. The acceleration of the particle in m/s^2 is

25. In the circuit shown, A and V are ideal ammeter and voltmeter respectively. Reading of the voltmeter in volt will be :



SPACE FOR ROUGH WORK

PART II - CHEMISTRY

This part contains 25 questions

SECTION - A

Chemistry - Question No. - (26-40)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Chemistry Question No. - (41 - 50)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

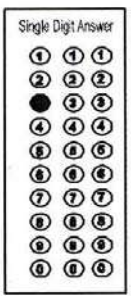
Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

If Single Digit Answer

If answer is 3

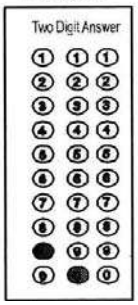
Example 1



If Two Digit Answer

If answer is 90

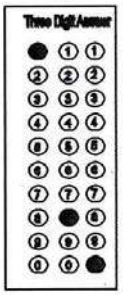
Example 2



If Three Digit Answer

If answer is 180

Example 3



SECTION A - CHEMISTRY

26. The formula of compound formed between two elements (A) and (B) having atomic numbers 1 and 17 respectively, is

1) A_2B_3 2) AB_2 3) AB 4) A_3B_2

27. Four substances were thoroughly mixed with water separately to obtain mixtures A, B, C and D. Some of their properties are given below:

I) Path of a beam of light passing through it was visible in A, B and D but invisible in C

II) On leaving undisturbed, the particles of the substance settle down in A but not in B, C and D

III) The solute particles are visible to naked eye in a but invisible in B, C and D

Which of the following is correct about A, B, C and D?

1) A, B and D are colloids, C is a solution

2) A is a suspension, B, C and D are colloids

3) A is a colloid, B, C and D are solutions

4) A is a suspension, B and D are colloids, C is a solution

SPACE FOR ROUGH WORK

28. The smallest particle of an element or a compound that shows all the properties of the substance and have free existence is a/an

1) atom 2) radical 3) molecule 4) ion

29. Match **List-I** with **List-II.**

List-I (reaction)		List-II (Type of reaction)	
i)	A compound breaks apart into elements	p)	Combination
ii)	A metal and non metal react to form an ionic compound	q)	Decomposition
iii)	A compound of hydrogen and carbon react with oxygen to produce carbon dioxide and water	r)	Displacement
iv)	Silver ion from $AgNO_{3(aq)}$ forms precipitate with bromide ions from $KBr_{(aq)}$	s)	Double displacement
		t)	Combustion

Choose the most appropriate answer from the options given below

1) (i) - q; (ii) - p; (iii) - r; (iv) - s 2) (i) - q; (ii) - t; (iii) - q; (iv) - r

3) (i) - s; (ii) - r; (iii) - q; (iv) - p 4) (i) - q; (ii) - p; (iii) - t; (iv) - s

SPACE FOR ROUGH WORK

30. In which among the following electrovalent compounds both cation and anion posses the same inert gas configuration?

1) Calcium fluoride (CaF_2)

2) Sodium oxide (Na_2O)

3) Magnesium chloride ($MgCl_2$)

4) Sodium chloride (NaCl)

31. Which statement among the following is incorrect?

1) 22 carat gold is an alloy. It is gold alloyed with either silver or copper

2) Solder an alloy of lead and tin (Pb and Sn) has low melting point

3) Brass an alloy of copper and zinc (Cu and Zn) is not a good conductor of electricity

4) Cinnabar an alloy of mercury and sulphur (Hg and S) is an amalgam

32. The element among the following which has two electrons in the outer most shell is

1) Oxygen (O) 2) Sodium (Na) 3) Magnesium (Mg) 4) Fluorine (F)

SPACE FOR ROUGH WORK

33. ${}^{x}_{y}A$ and ${}^{p}_{q}B$ are isotopes. Which equation among the following is correct regarding the isotopes?

1) $(x^2 - q^2)(y^2 - p^2) = 0$

2) $(x^2 + p^2)(y^2 + q^2) = 0$

3) $(x^2 - p^2)(y^2 - q^2) = 0$

4) $(x^2 + q^2)(y^2 + q^2) = 0$

34. The correct set of co-efficients x, y, z and w for the balanced chemical equation

$xNH_{3(g)} + yO_{2(g)} \longrightarrow zNO_{(g)} + wH_2O_{(g)}$ is

1) x = 4; y = 6; z = 4; w = 7

2) x = 4; y = 5; z = 4; w = 6

3) x = 4; y = 6; z = 4; w = 5

4) x = 5; y = 4; z = 5; w = 6

SPACE FOR ROUGH WORK

35. An element X reacts with dilute H_2SO_4 as well as with NaOH to produce salt and $H_2(g)$. Hence, it may be concluded that

I) X is an electropositive element

II) Oxide of X is basic in nature

III) Oxide of X is acidic in nature

IV) X is an electronegative element

1) III, IV, I 2) IV, I, III 3) I, II, III 4) II, III, IV

36. Butanone is a four carbon compound with the functional group of which class of compounds among the following?

1) Carboxylic acid

2) Alcohol

3) Aldehyde

4) Ketone

37. The reaction commonly used in the hydrogenation of vegetable oils using a catalyst belongs to

1) Addition reaction

2) Oxidation reaction

3) Substitution reaction

4) Combustion reaction

SPACE FOR ROUGH WORK

38. The liquid non-metal at room temperature (298 K) is

1) Chlorine 2) Bromine 3) Phosphorus 4) Mercury

39. Given below are two statements, one is labelled as Asserion (A) and the other is labelled as Reason (R).

Assertion (A) : Hydrogen gas is evolved when zinc (Zn) metal react with dilute hydrochloric acid

Reason (R) : all metals displaces hydrogen from dilute hydrochloric acid

In the light of the above statemetns select the most appropriate answer from options given below

1) Both A and R are correct and R is the correct explanation of A

2) Both A and R are correct and R is not the correct explanation of A

3) A is correct but R is false

4) R is correct but A is false

40. On treating with aqueous sodium hydroxide which is an alkali, ester is converted into to alcohol and sodium salt of carboxylic acid. This reaction is known as

1) Saponification 2) Neutralisation 3) Esterification 4) Dehydration

SPACE FOR ROUGH WORK

SECTION B - CHEMISTRY

41. The number of electrons present in the outermost shell of Neon (Atomic number = 10) is .....

42. For how many of the following substances pH is equal to or more than 7 at 298 K?

i) Gastric juice ii) Blood iii) Aqueous sodium hydroxide

iv) Pure water v) Milk of magnesia vi) Lemon juice

43. Formula unit mass is calculated the same way as molecular mass is calculated. The formula unit mass of Aluminium sulphate is ..... u (Given : Atomic mass of H = 1u, N = 14 u, O = 16u, S = 32u, Al = 27u, Na = 23u)

44. How many of the following are organic compounds?

i) Ammonium cyanate ii) Fullerene iii) Acetic acid

iv) Sodiumbicarbonate v) Urea vi) Carbonic acid

45. Number of atoms present in a molecule of hydrogen is .....

46. Number of atoms in one formula unit of washing soda is 'x' and number of atoms in one formula unit of bakingsoda is 'y'. Give the value of $(x \times y)$

SPACE FOR ROUGH WORK

47. How many of the following can displace copper from aqueous copper sulphate?

i) Magnesium (Mg) ii) Gold (Au) iii) Iron (Fe) iv) Hydrogen gas (H_2)

v) Mercury (Hg) vi) Lead (Pb) vii) Silver (Ag) viii) Zinc (Zn)

48. How many of the following statement(s) is/are correct?

i) Sodium and potassium catch fire if kept in open. Hence to protect them and prevent accidental fires they are kept immersed in water

ii) At ordinary temperature the surface of metals such as magnesium (Mg), Aluminium (Al), Zinc (Zn) and Lead (Pb) are covered with a thin layer of oxide

iii) Iron does not burn on heating

iv) Copper burn vigorously on heating

v) Silver and copper do not react with oxygen even at high temperature

49. Consider the binary compounds CO, NO, Na_2O, CaO, H_2O, ZnO, CO_2, NO_2, Al_2O_3 and CuO. The number of compounds among these that are neither basic nor amphoteric are .....

50. How many of the following are gases at 1 atmosphere prsent and 300 K temperature?

i) Carbon dioxide (CO_2) , ii) Diamond ($C_{diamond}$), iii) Gold (Au), iv) Nitrogen (N_2), (v) Silver (Ag), (vi) Oxygen (O_2)

SPACE FOR ROUGH WORK

PART III - MATHEMATICS

This part contains 25 questions

SECTION - A

Mathematics - Question No. - (51-65)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Mathematics - Question No. - (66 - 75)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

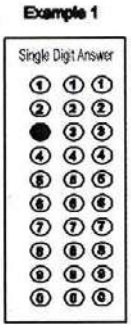
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

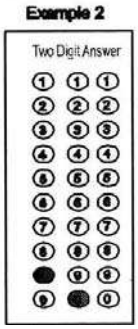
If Single Digit Answer

If answer is 3



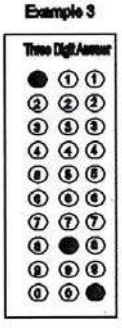
If Two Digit Answer

If answer is 90



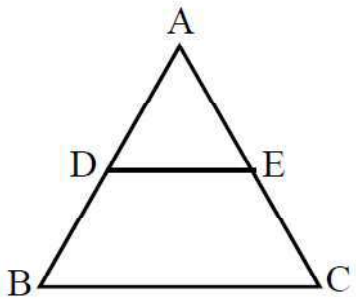
If Three Digit Answer

If answer is 180



SECTION A - MATHEMATICS

51. From the adjacent figure of triangle ABC, DE||BC and $\frac{AD}{DB}=\frac{3}{5}$. If AC = 16, then EC is



1) 12 2) 14 3) 11 4) 10

52. A field ABC is in the form an equilateral triangle. There are two pillers AP of height 80m and BQ of height 20m are placed at two corner of the field ABC at A and B. If is given that $\angle ACP$ and $\angle BCQ$ are complementary to each other $(\text{ie, } \angle ACP+\angle BCQ=90°)$. If D be a point on AB, so that $\angle BDQ$ is equal to $\angle ADP$. Then AD × DB is

1) 256 2) 216 3) 144 4) 284

SPACE FOR ROUGH WORK

53. Equations of three straight lines are given below $L_1 : 3x - y = 5$, $L_2 : 4x + y = 9$ and $L_3 : x + 2y - 11 = 0$. The lines L_2, L_3 intersect at A (a, p); L_1, L_2 intersect at B(b, q) and L_3, L_1 intersect at C(c, r). If $k = \frac{a^2 + b^2 + c^2}{p - 2q + r}$ and $l = \frac{a + b + c + 3}{p^2 - r^2}$ then which of the following is not TRUE?

1) $7k + 3l = 17$ 2) $4k + 3l = 10$

3) $3k + 2l = 8$ 4) $5k - 6l = 4$

54. In the figure O is centre of the circle and $\angle AOB = 102°$. Then $\angle P + \angle Q + \angle R$ is

1) 165° 2) 183° 3) 153° 4) 200°

SPACE FOR ROUGH WORK

55. The hypotenuse of a right triangle is 26 cm and its perimeter is 60 cm. Then area of the triangle is

1) 120 cm^2 2) 180 cm^2

3) 128 cm^2 4) 182 cm^2

56. What is the remainder, when $x^2 + 1$ is divided by $x + 1$?

1) 2 2) 1

3) 0 4) 3

57. If $x + k$ is a factor of $x^3 + kx^2 - 2kx - k - 6$, then positive value of k is

1) 1 2) $\frac{3}{2}$

3) 3 4) 2

SPACE FOR ROUGH WORK

58. 19^{th} term of the sequence 1, 4, 7, 10 ..... is

1) 54 2) 57

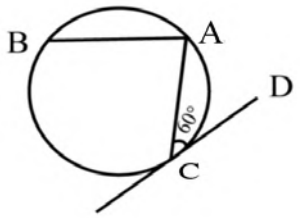
3) 56 4) 55

59. $6\sin 30° + 2\cos 30°$ is

1) $3 + \sqrt{3}$ 2) $2 + 3\sqrt{3}$

3) $1 + 3\sqrt{3}$ 4) $3 + 2\sqrt{3}$

60. In the figure AB = AC and $\overline{CD}$ is a tangent at C. If $\angle ACD = 60°$, then $\angle BAC$ is



1) 50° 2) 60°

3) 65° 4) 55°

SPACE FOR ROUGH WORK

61. N_i is a two digit number formed by the digits 1, 2, 3, 4 and 5, with repetition is allowed, that is $N_1 = 11$ and $N_{25} = 55$. Let $S(N_i)$ denote the sum of the digits of N_i. Then $S(N_1) + S(N_2) + ... + S(N_{25})$ is

1) 200 2) 175

3) 150 4) 225

62. A six digit number 71521K is divisible by 3 and 5 then K is

1) 2 2) 5

3) 3 4) 0

63. If $m^2 - 7m + 1 = 0$ then $m + \frac{1}{m}$ is

1) 5 2) 1

3) 3 4) 7

SPACE FOR ROUGH WORK

64. Which rational expression should be added with $3x^2 + 2x + 1$ to get $4x^2 + 5x + 3$?

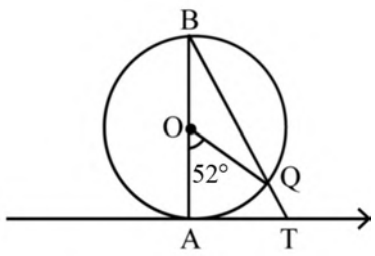
1) $x^2 + 3x - 2$

2) $x^2 + 3x + 2$

3) $x^2 - 3x - 2$

4) $x^2 - 3x + 2$

65. In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 52°$, then the degree measure of $\angle ATQ$ is .....



1) 56°

2) 46°

3) 64°

4) 65°

SPACE FOR ROUGH WORK

SECTION B - MATHEMATICS

66. The number of ordered pair (x,y) satisfy the equations $7x - y = 16$ and $5x + y = 20$, is

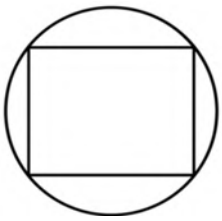
67. If $x - 1$ is a factor of $2x^3 + \lambda x^2 - 8x - 11 = 0$, then the value of '$\lambda$' is

68. Value of $\left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)$ is

69. If $76^2 + 56^2 + 75^2 - 44^2 - 25^2 - 24^2 = 100K$, then the value of K is

70. If sum of three consecutive terms of an arithmetic progression is 18. Then the middle term is

71. A circle is circumscribed a square of perimeter 40 cm as in the following figure. If diameter of the circle is $k\sqrt{2}$, then k is



SPACE FOR ROUGH WORK

72. Sum of all prime numbers less than 10 is

73. Coefficient of x in $(x + 3)^2 - (x - 3)^2$ is

74. Sum of LCM and HCF of 24 and 33 is

75. Coefficient of x in the expression $\frac{x^2 - 4}{x - 2}$ is

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

IIT/AIIMS SCREENING TEST - 05-10-2025

QUESTION BOOKLET CODE

C

P + C + M - ANSWER KEY

PHYSICS

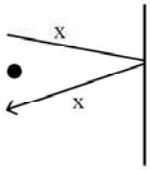
1. 4 Minimum when all connected in parallel $R = \frac{r}{10}$
2. 3 Using right hand rule
3. 4 At earth centre $F_G = 0 \Rightarrow = 0$
4. 2 To get equal voltage appliances are connected in parallel
5. 1 $\Delta s = (50 - 20) = 30$
6. 2 $g = 10\frac{m}{s^2} = \frac{10 \times (10^{-3}\,km)}{\left(\frac{1}{3600}\,h\right)} = 10 \times 3600 \times 3600 \times 10^{-3}\,kmh^{-2}$

   Therefore, $g = 129600\ kmh^{-2}$
7. 3 Displacement is a vector quantity so it has a definite direction
8. 4 The phenomenon of splitting the light is called dispersion of light
9. 1
10. 3 Velocity of sound doesnot depend on frequency
11. 1 $m = \frac{-V}{u}; \frac{-9}{3} = \frac{(3+x)}{x}$

    $3x = 3x;\ x = \frac{3}{2} = 150\ cm$

    Distance from wall to mirror = 3 + x = 300 + 150 = 450 cm
12. 2 $F_{net} = 0$. So the boat remain stationary
13. 3 The air resistance reduce the speed of satellite that unbalance the gravitational and centripetal forces. This cause the body to accelerate downward because gravitation force become greater than centripetal force. The velocity downward increase and velocity on sidewise decrease. Since gravitational force is greater than resistance. Its net velocity (speed) will increase so its KE increase.
14. 1 $F_{net} = 0$, $W = F_{net}.d = 0$
15. 4 $f = R/2 = \frac{25}{2} = 12.5$

    $V = IR$; $R = 0$; $V = 0$
16. 170 Sound travel 2x distance where x is the distance between man and cliff



$V = {}^{d}\!/_{t} \Rightarrow 340 = \frac{2x}{1} \Rightarrow 2x = 340;\ x = 170$

17. 20 Image and object is same size when object is at 2F. $2 \times 10 = 20$

18. 10 In series combination $R = R_1 + R_2 = 4 + 6 = 10\Omega$

19. 50 $P = F.V = 5 \times 10 = 50$

20. 0

21. 100 $Wg = Fg \times d = mg \times 2 = 5 \times 10 \times 2 = 100$

22. 5 $I = \frac{q}{t} = \frac{50}{10} = 5$ sec

23. 6 $g_{moon} = {}^{g_{earth}}\!/_{6}$

$60 = m \times 10;\ m = 6$ kg

24. 25 $a = \frac{F}{m} = \frac{50}{20} = 25$

SPACE FOR ROUGH WORK

25. 0 Resistance across ideal ammeter = 0

CHEMISTRY

26. 3 The compound is HCl.
27. 4 A is suspension as particles are visible to naked eye and settle down
C is solution as beam of light is invisible in it
B and D are colloids as particles are invisible and beam of light visible.
28. 3 Definition of molecule
29. 4 (i) decomposition (ii) Combination (iii) Combustion (iv) Double displacement
30. 2
31. 4 Cinnabar (HgS) is an ore of mercury
32. 3 E.C. of $_{12}Mg$ is 2, 8, 2
33. 3 $^{x}_{y}A$ and $^{p}_{q}B$ are isotopes ; y = q since atomic number is the same
34. 2 The balanced chemical equation is $4NH_{3(g)} + 5O_{2(g)} \longrightarrow 4NO_{(g)} + 6H_2O_{(g)}$
35. 3 X is amphoteric in nature and electropositive
36. 4 Butanone ie $CH_3COCH_2CH_3$ is a ketone
37. 1 Hydrogenation of vegetable oils is addition reaction
38. 2 Bromine is liquid at 298 K
39. 3 Assertion is correct but reason is wrong
40. 1 Alkali catalysed hydrolysis of ester is called saponification
41. 8 E.C. of $_{10}Ne$ is 2, 8
42. 4 Milk of magnesia, pure water, blood, NaOH (aq)
43. 342 Aluminium sulphate is $Al_2(SO_4)_3$
44. 2 Acetic acid and urea are organic compounds
45. 2 Hydrogen molecule is H_2

SPACE FOR ROUGH WORK

46. 216 Washing soda is $Na_2CO_3.10H_2O$
x = 36
Baking soda is $NaHCO_3$
y = 6

47. 5 Mg, Zn, Fe, Pb and H_2 can displace Cu from $CuSO_4$ solution

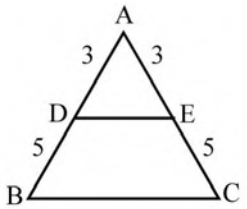
48. 2 Only (ii) and (iii) are correct statements

49. 5 CO_2 and NO_2 are acidic. CO, NO and H_2O are neutral

50. 3 N_2, O_2 and CO_2 are gases diamond, Au and Ag are solids.

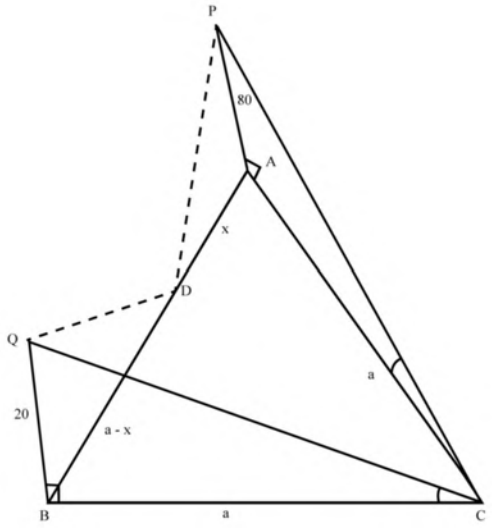
MATHEMATICS

51. 4 $$\frac{AD}{DB}=\frac{AE}{EC}=\frac{3}{5}\Rightarrow\frac{AE+EC}{EC}=\frac{3+5}{5}$$
$$\therefore\frac{AC}{EC}=\frac{8}{5}\Rightarrow EC=\frac{AC\times5}{8}=\frac{16\times5}{8}=10$$



52. 1

SPACE FOR ROUGH WORK



In ΔPAC, $\tan\alpha = \frac{80}{a}$; $\tan\beta = \frac{20}{a}$

where, $\alpha = \angle ACP$, $\beta = \angle BCQ$; Given $\alpha + \beta = 90°; \beta = 90 - o$

$\tan\beta = \tan(90-\alpha) = (0+\alpha)$

$\tan\alpha.\tan\beta = 1$

$\frac{80}{a}.\frac{20}{a} = 1 \Rightarrow a^2 = 100;\ a = 40$

Let $AD = x$ then $BD = 40 - x$

$\tan\angle ADP = \frac{80}{x}$ $\tan\angle BDQ = \frac{20}{40-x}$

Given $\angle ADP = \angle BDQ \Rightarrow \frac{80}{x} = \frac{20}{40-x}$

$\Rightarrow 4(40-x) = x;\ 160 - 4x = x \Rightarrow 5x = 160; x = 32$

$\therefore$ AD = 32, then BD = 40 − 32 = 8

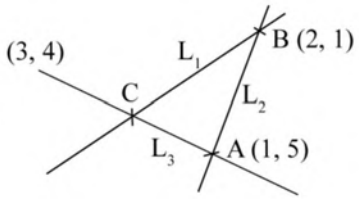
$\therefore$ AD.DB = 32 × 8 = 256

53. 2 $L_1 : 3x - y = 5$; $L_2 : 4x + y = 9$; $L_3 : x + 2y = 11$

Solving L_2 and L_3

SPACE FOR ROUGH WORK

$$8x + 2y = 18$$
$$x + 2y = 11$$
$$7x \quad \Rightarrow 7 \Rightarrow x = 1;\ y = 5 \Rightarrow A(1,5)$$



Solving L_1 and L_3

$$6x - 2y = 10$$
$$x + 2y = 11$$
$$7x = 21 \Rightarrow x = 3 \text{ and } y = 4 \Rightarrow C(3,4)$$

Solving L_1 and L_2

$$3x - y = 5$$
$$4x + y = 9$$
$$7x = 14 \Rightarrow x = 2 \text{ and } y = 1 \Rightarrow B(2,1)$$

$A(1, 5) \Rightarrow a = 1; p = 5$
$B(2, 1) \Rightarrow b = 2; q = 1$
$C(3, 4) \Rightarrow c = 3; r = 4$

$$K = \frac{a^2 + b^2 + c^2}{p - 2q + r} = \frac{1^2 + 2^2 + 3^2}{5 - 2 + 4} = \frac{14}{7} = 2$$

$$\ell = \frac{a + b + c + 3}{p^2 - q^2} = \frac{1 + 2 + 3 + 3}{25 - 16} = \frac{9}{9} = 1$$

SPACE FOR ROUGH WORK

1) $7K + 3l = 14 + 3 = 17$ true
2) $5K - 6l = 10 - 6 = 4$ true
3) $3K + 2l = 6 + 2 = 8$ true
4) $4K + 3l = 8 + 3 = 11$ false

54. 3 $\angle P = \angle Q = \angle R = \frac{1}{2}\angle AOB = 51; \therefore \angle P + \angle Q + \angle R = 153°$

55. 1 $x + y + 26 = 60$

$x + y = 34$

$x^2 + y^2 = 26^2 = 676$

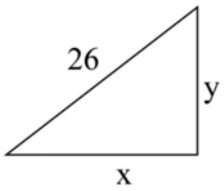
$\therefore (x + y)^2 = 34^2$

$x^2 + y^2 + 2xy = 1156$

$2xy = 1156 - 676$

$xy = 240$

$\text{Area} = \frac{1}{2}xy = 120$



56. 1 $P(x) = x^2 + 1$, then the remainder $P(-1) = (-1)^2 + 1 = 2$

SPACE FOR ROUGH WORK

57. 4 $P(x) = x^3 + Kx^2 - 2Kx - K - 6$

$P(-K) = -K^3 + K^3 + 2K^2 - K - 6 = 0$

$\therefore 2K^2 - K - 6 = 0$

$2K^2 - 4K + 3K - 6 = 0$

$2K(K-2) + 3(K-2) = 0$

$(K-2)(2K+3) = 0 \Rightarrow K = 2, \frac{-3}{2} \Rightarrow K = 2$

58. 4 $t_n = a + (n-1)d$

$t_{19} = 1 + 18 \times 3 = 55$

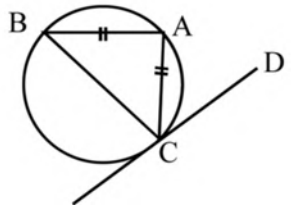
59. 1

60. 2 Given $\angle ACD = 60°$

$\therefore \angle ABC = 60°$

$\therefore \angle ACB = 60°$ Since $AB = AC$

$\therefore \angle BAC = 60°$



61. 3 Here unit and tens places of each digit repeats 5 times
Therefore sum of all digits = 5(1 + 2+ 3+4+5) + 5(1 + 2 + 3 + 4 + 5) = 5 ×15 + 5×15
= 75 + 75 = 150

SPACE FOR ROUGH WORK

62. 2 K is 0 or 5 and 7 + 1 + 5 + 2 + 1 + K = M(3),
When K = 0, sum of digits $\neq$ M(3); K=5 sum of digits = M(3)
$\Rightarrow$ K = 5

63. 4 $m^2 - 7m + 1 = 0 \Rightarrow m + \frac{1}{m} = 7$

64. 2 $P(x) = \left(4x^2 + 5x + 3\right) - \left(3x^2 + 2x + 1\right) = x^2 + 3x + 2$

65. 3 $\angle OBQ = \frac{1}{2}\angle AOQ = 26°$
In ΔABT, $\angle OBQ + \angle ATQ = 90° \Rightarrow ATQ = 64°$

66. 1 $7x - y = 16$ and $5x + y = 20$
Solving x = 3 and y = 5; (x,y) = (3,5)

67. 17 $P(x) = 2x^3 + \lambda x^2 - 8x - 11$
$P(1) = 2 + \lambda - 8 - 11 = 0$
$\Rightarrow \lambda - 17 = 0 \Rightarrow \lambda = 17$

68. 12 $\left(2+\sqrt{2}\right)\left(2-\sqrt{2}\right) = 4 - 2 = 2$
$\left(3+\sqrt{3}\right)\left(3-\sqrt{3}\right) = 9 - 3 = 6$
$\therefore \left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right) = 2 \times 6 = 12$

SPACE FOR ROUGH WORK

69. 114 $\left(76^2-24^2\right)+\left(56^2+44^2\right)+\left(75^2-25^2\right)=100\times52+100\times12+100\times50$

$=100\left(52+12+50\right)=11400=100\ \mathrm{K}\Rightarrow \mathrm{K}=114$

70. 6 a–d + a + a + d = 18 $\Rightarrow$ 3a = 18, a = 6

71. 10 $4a=40\Rightarrow a=10$

Diameter of circle = diagonal of the square $=10\sqrt{2}=\mathrm{K}\sqrt{2}\Rightarrow \mathrm{K}=10$

72. 17 2 + 3 + 5 + 7 = 17

73. 12 $(x+3)^2-(x-3)^2=(x^2+6x+9)(x^2-6x-9)=12x$

74. 267 HCF = 3

LCM = 264, HCF + LCM = 3 + 264 = 267

75. 1 $\frac{x^2-4}{x-2}=x+2$

SPACE FOR ROUGH WORK

Brilliant STUDY CENTRE PALA

IIT/AIIMS - 2028 SCREENING TEST

QUESTION BOOKLET CODE

D

Date : 5th October 2025

IMPORTANT INSTRUCTIONS

Please read the instructions carefully

1. Do not break the seal of this question booklet before being instructed to do so by the invigilators
2. Please fill in all the details such as name, roll number and signature of the candidate in the columns given below.
3. The test is of **2 hour** duration.
   This question booklet contains 75 questions and **Maximum Mark is 240**
4. There are three Parts. Physics, Chemistry & Mathematics having 25 questions each. Each Part consists of two Sections. **In Section A** (15 questions) each question has four options (1), (2), (3) and (4). **Only one** of these four options is correct. Each correct answer will be awarded **FOUR** marks. **ONE** mark will be deducted for each incorrect answer.
5. **In Section B** (10 questions). **Out of these 10 questions candidate can choose to attempt any 5 questions.In the event of a candidate attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.** Each question has an answer which is a number with one/two/three digits. Each correct answer will be awarded **FOUR** marks. **NO NEGATIVE** mark for incorrect answer in Section B
6. Mark the bubble corresponding to the Answer in the Optical Response Sheet (ORS) by using either **Blue or Black ball - point pen only**
7. More than one answer marked against a question will be deemed as incorrect answer.
8. No negative mark for unattended Question.
9. Question paper booklet code is printed on the right hand top of this booklet
10. The paper CODE is printed on the right part of the ORS. Ensure that the code is identical and same as that on the question paper booklet. If not, contact the invigilator for change.
11. Handover the Answer sheet to the invigilator at the end of the examination

IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 75 QUESTIONS. IF NOT, REQUEST FOR REPLACEMENT

Name of the Candidate	Roll Number
I have read all the instructions and shall abide by them _ _ _ _ _ _ _ _ _ _ _ **Signature of the Candidate**	**I have verified all the information filled by the candidate** _ _ _ _ _ _ _ _ _ _ _ **Signature of the Invigilator**

SPACE FOR ROUGH WORK

PART I - PHYSICS

This part contains 25 questions

SECTION - A

Physics - Question No. - (1-15)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Physics - Question No. - (16 - 25)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

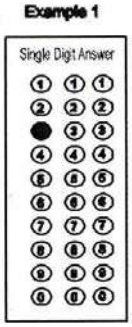
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

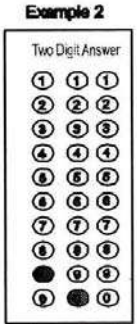
If Single Digit Answer

If answer is 3



If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180

SPACE FOR ROUGH WORK

SECTION A - PHYSICS

1. The distance travelled by a body is directly proportional to time. Then the force acting on body will be:

   1) 1N
   2) 0 N
   3) 9.8 N
   4) 98 N

2. The frequency of a sound wave is 'n 'and its velocity is 'v'. If the frequency is increased to 4n, the velocity of the wave will be

   1) v/4
   2) 2v
   3) 4v
   4) v

3. A candle flame 3 cm is placed at distance of 3m from a wall. How far from wall must a concave mirror be placed in order that it may form an image of flame 9 cm high on the wall

   1) 225 cm
   2) 450 cm
   3) 300 cm
   4) 650 cm

SPACE FOR ROUGH WORK

4. A student has 10 resistors of resistance 'r' each. The minimum resistance made by him from given resistors is:

1) $\frac{r}{10}$

2) 10 r

3) $\frac{r}{100}$

4) $\frac{r}{5}$

5. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is

1) towards west

2) towards south

3) towards east

4) towards north

SPACE FOR ROUGH WORK

6. The value of g on earth surfae is 9.8 m/s^2 then the value of g at earth's centre in m/s^2 is

1) 9.8

2) 19.6

3) 4.9

4) zero

7. The electrical appliances in a house are connected in:

1) Parallel

2) Series

3) Either in series or parallel

4) Both in series and parallel

SPACE FOR ROUGH WORK

8. An electric fan is placed on a stationary boat and air is blown with it on the sail of the boat. Which of the following statement(s) is/are correct?

1) The boat will be uniformly accelerated in the direction of flow of air

2) The boat will start moving with uniform speed

3) The boat will remain stationary as before

4) The boat will be uniformly accelerated opposite to the direction of flow of air

9. When a satellite in a circular orbit around the earth enters the atmospheric region, it encounters small air resistance to its motion. Then

1) Gravitational force on satellite decreases

2) Its kinetic energy decreases

3) Its period of revolution around the earth increases

4) Its kinetic energy increases

SPACE FOR ROUGH WORK

10. A body is under the action of two equal and opposite forces, each of 3N. The body is displaced by 3m. The work done is

1) +9 J

2) 0

3) –9 J

4) 18 J

11. The radius of curvature of a convex mirror is 25cm. Calculate its focal length

1) 12.5 cm

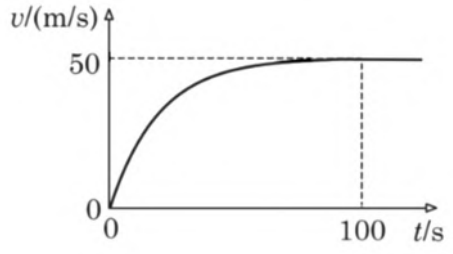
2) 50 cm

3) 30 cm

4) 25 cm

SPACE FOR ROUGH WORK

12. Two cars A and B simultaneously start a race. Velocity 'v' of the car A varies with time 't' according to the graph shown in the figure. It aquires a velocity 50 m/s few seconds before t = 100 s and thereafter moves with this speed. Car B runs together with car A till both acquire a velocity 20 m/s; after this, car B moves with zero acceleration for one second and then follows velocity-time profile identical to that of A with a delay of one second. In this way, car B acquires the velocity 50 m/s one second after A acquires it. How much more distance Δs in in meter does the car A cover in the first 100 s as compared to the car B?



1) $\Delta s = 20$ m

2) $\Delta s = 30$ m

3) $\Delta s < 30$ m

4) Insufficient information

SPACE FOR ROUGH WORK

13. If the acceleration due to gravity is 10 ms^{-2} and the units of length and time are changed in kilometre and hour, respectively, the numerical value of the acceleration is

1) 360,000

2) 72,000

3) 129,600

4) 36,000

14. Which of the following statements is NOT true?

1) Magnitude of displacement is equal or less than the distance travelled

2) Displacement has specific direction

3) Displacement of a body can be zero

4) Displacement has no specific direction

SPACE FOR ROUGH WORK

15. Splitting of light into its colours is called:-

1) Dispersion 2) Scattering

3) Refraction 4) Reflection

SECTION B - PHYSICS

16. A mass of 5kg is taken to a depth of 2m. Work done by gravity in joule is [$g = 10\ m/s^2$]

17. 50C of charge flown through a circuit in 10 second. The current flowing through the circuit in ampere is

18. Weight of an object at the surface of the earth is 60 N. The mass of the object at the surface of the moon in kg is [$g_{earth} = 10 m/s^2$]

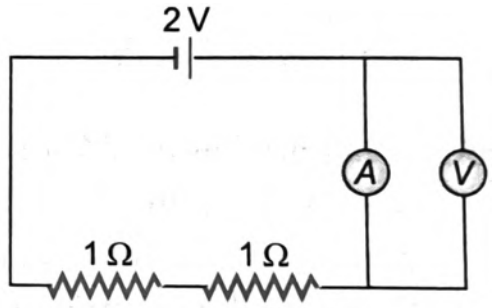
19. A man standing on a cliff claps his hand hears its echo after 1s. If found is reflected from mountain and velocity of sound in air is 340 ms^{-1}. Then the distance between the man and reflection point in meter is

20. A convex lens of focal length 10 cm produces an image which is having same size as that of the object. The magnitude of object distance from the lens in cm is

21. The force acting on a particle of mass 2kg is 50 N. The acceleration of the particle in m/s^2 is

SPACE FOR ROUGH WORK

22. In the circuit shown, A and V are ideal ammeter and voltmeter respectively. Reading of the voltmeter in volt will be :



23. Two resistors 4Ω and 6Ω are connected in series. The effective resistance in ohm is

24. The force acting on a particle is 5N. The velocity of the particle at an instant is 10 m/s. The power at the instant in W is

25. When a particle is moving with a constant velocity, its acceleration in m/s^2 is

SPACE FOR ROUGH WORK

PART II - CHEMISTRY

This part contains 25 questions

SECTION - A

Chemistry - Question No. - (26-40)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Chemistry Question No. - (41 - 50)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

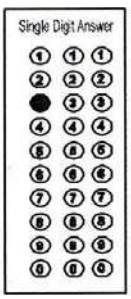
Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

If Single Digit Answer

If answer is 3

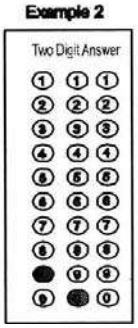
Example 1



If Two Digit Answer

If answer is 90

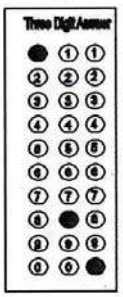
Example 2



If Three Digit Answer

If answer is 180

Example 3



SECTION A - CHEMISTRY

26. The correct set of co-efficients x, y, z and w for the balanced chemical equation

$xNH_{3(g)} + yO_{2(g)} \longrightarrow zNO_{(g)} + wH_2O_{(g)}$ is

1) x = 4; y = 6; z = 4; w = 7

2) x = 5; y = 4; z = 5; w = 6

3) x = 4; y = 5; z = 4; w = 6

4) x = 4; y = 6; z = 4; w = 5

27. An element X reacts with dilute H_2SO_4 as well as with NaOH to produce salt and H_2(g). Hence, it may be concluded that

I) X is an electropositive element

II) Oxide of X is basic in nature

III) Oxide of X is acidic in nature

IV) X is an electronegative element

1) II, III, IV 2) IV, I, III 3) III, IV, I 4) I, II, III

SPACE FOR ROUGH WORK

28. Butanone is a four carbon compound with the functional group of which class of compounds among the following?

1) Ketone 2) Carboxylic acid 3) Aldehyde 4) Alcohol

29. The formula of compound formed between two elements (A) and (B) having atomic numbers 1 and 17 respectively, is

1) A_3B_2 2) AB_2 3) A_2B_3 4) AB

30. Four substances were thoroughly mixed with water separately to obtain mixtures A, B, C and D. Some of their properties are given below:

I) Path of a beam of light passing through it was visible in A, B and D but invisible in C

II) On leaving undisturbed, the particles of the substance settle down in A but not in B, C and D

III) The solute particles are visible to naked eye in a but invisible in B, C and D

Which of the following is correct about A, B, C and D?

1) A is a suspension, B and D are colloids, C is a solution

2) A, B and D are colloids, C is a solution

3) A is a colloid, B, C and D are solutions

4) A is a suspension, B, C and D are colloids

SPACE FOR ROUGH WORK

31. The smallest particle of an element or a compound that shows all the properties of the substance and have free existence is a/an

1) ion 2) radical 3) atom 4) molecule

32. Match **List-I** with **List-II.**

List-I (reaction)		**List-II (Type of reaction)**	
i)	A compound breaks apart into elements	p)	Combination
ii)	A metal and non metal react to form an ionic compound	q)	Decomposition
iii)	A compound of hydrogen and carbon react with oxygen to produce carbon dioxide and water	r)	Displacement
iv)	Silver ion from $AgNO_{3(aq)}$ forms precipitate with bromide ions from $KBr_{(aq)}$	s)	Double displacement
		t)	Combustion

Choose the most appropriate answer from the options given below

1) (i) - q; (ii) - p; (iii) - t; (iv) - s 2) (i) - q; (ii) - p; (iii) - r; (iv) - s

3) (i) - s; (ii) - r; (iii) - q; (iv) - p 4) (i) - q; (ii) - t; (iii) - q; (iv) - r

SPACE FOR ROUGH WORK

33. The reaction commonly used in the hydrogenation of vegetable oils using a catalyst belongs to

1) Substitution reaction
2) Addition reaction
3) Oxidation reaction
4) Combustion reaction

34. The liquid non-metal at room temperature (298 K) is

1) Chlorine
2) Mercury
3) Bromine
4) Phosphorus

35. Given below are two statements, one is labelled as Asserion (A) and the other is labelled as Reason (R).

Assertion (A) : Hydrogen gas is evolved when zinc (Zn) metal react with dilute hydrochloric acid

Reason (R) : all metals displaces hydrogen from dilute hydrochloric acid

In the light of the above statemetns select the most appropriate answer from options given below

1) Both A and R are correct and R is the correct explanation of A

2) Both A and R are correct and R is not the correct explanation of A

3) A is correct but R is false

4) R is correct but A is false

SPACE FOR ROUGH WORK

36. On treating with aqueous sodium hydroxide which is an alkali, ester is converted into to alcohol and sodium salt of carboxylic acid. This reaction is known as

1) Esterification
2) Saponification
3) Neutralisation
4) Dehydration

37. In which among the following electrovalent compounds both cation and anion posses the same inert gas configuration?

1) Calcium fluoride (CaF_2)
2) Sodium chloride (NaCl)
3) Sodium oxide (Na_2O)
4) Magnesium chloride ($MgCl_2$)

38. Which statement among the following is incorrect?

1) Cinnabar an alloy of mercury and sulphur (Hg and S) is an amalgam

2) 22 carat gold is an alloy. It is gold alloyed with either silver or copper

3) Brass an alloy of copper and zinc (Cu and Zn) is not a good conductor of electricity

4) Solder an alloy of lead and tin (Pb and Sn) has low melting point

SPACE FOR ROUGH WORK

39. The element among the following which has two electrons in the outer most shell is

1) Fluorine (F) 2) Sodium (Na)

3) Oxygen (O) 4) Magnesium (Mg)

40. ${}^{x}_{y}A$ and ${}^{p}_{q}B$ are isotopes. Which equation among the following is correct regarding the isotopes?

1) $(x^2 + q^2)(y^2 + q^2) = 0$ 2) $(x^2 + p^2)(y^2 + q^2) = 0$

3) $(x^2 - q^2)(y^2 - p^2) = 0$ 4) $(x^2 - p^2)(y^2 - q^2) = 0$

SECTION B - CHEMISTRY

41. Number of atoms in one formula unit of washing soda is 'x' and number of atoms in one formula unit of bakingsoda is 'y'. Give the value of $(x \times y)$

42. How many of the following can displace copper from aqueous copper sulphate?

i) Magnesium (Mg) ii) Gold (Au) iii) Iron (Fe)

iv) Hydrogen gas (H_2) v) Mercury (Hg) vi) Lead (Pb)

vii) Silver (Ag) viii) Zinc (Zn)

SPACE FOR ROUGH WORK

43. How many of the following statement(s) is/are correct?

i) Sodium and potassium catch fire if kept in open. Hence to protect them and prevent accidental fires they are kept immersed in water

ii) At ordinary temperature the surface of metals such as magnesium (Mg), Aluminium (Al), Zinc (Zn) and Lead (Pb) are covered with a thin layer of oxide

iii) Iron does not burn on heating

iv) Copper burn vigorously on heating

v) Silver and copper do not react with oxygen even at high temperature

44. The number of electrons present in the outermost shell of Neon (Atomic number = 10) is .....

45. For how many of the following substances pH is equal to or more than 7 at 298 K?

i) Gastric juice ii) Blood iii) Aqueous sodium hydroxide

iv) Pure water v) Milk of magnesia vi) Lemon juice

SPACE FOR ROUGH WORK

46. Consider the binary compounds CO, NO, Na_2O, CaO, H_2O, ZnO, CO_2, NO_2, Al_2O_3 and CuO. The number of compounds among these that are neither basic nor amphoteric are .....

47. How many of the following are gases at 1 atmosphere prsent and 300 K temperature?

i) Carbon dioxide (CO_2) , ii) Diamond ($C_{diamond}$), iii) Gold (Au), iv) Nitrogen (N_2), (v) Silver (Ag), (vi) Oxygen (O_2)

48. Formula unit mass is calculated the same way as molecular mass is calculated. The formula unit mass of Aluminium sulphate is ..... u (Given : Atomic mass of H = 1u, N = 14 u, O = 16u, S = 32u, Al = 27u, Na = 23u)

49. How many of the following are organic compounds?

i) Ammonium cyanate ii) Fullerene iii) Acetic acid

iv) Sodiumbicarbonate v) Urea vi) Carbonic acid

50. Number of atoms present in a molecule of hydrogen is .....

SPACE FOR ROUGH WORK

PART III - MATHEMATICS

This part contains 25 questions

SECTION - A

Mathematics - Question No. - (51-65)

Each question has FOUR options [1], [2], [3] and [4]. ONLY ONE of these four options is correct

For each question, darken the bubble corresponding to the correct option in the ORS

For each question, marks will be awarded in one of the following categories

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : –1 In all other cases

CORRECT METHOD FOR MARKING SECTION 'A' QUESTIONS

Correct method of marking	Wrong methods of marking							
	Tick mark	X mark	Dot mark	Scratch mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
● ② ③ ④	✓	✗	•	▨	◑	⊖	●	● ●

SECTION - B

Mathematics - Question No. - (66 - 75)

Out of these 10 questions candidate can choose to attempt any 5 questions. In case of attempting more than 5 questions, the first 5 questions answered by the candidate shall be evaluated.

The answer to each question is a NUMBER ranging from 0 to 999, both inclusive

For each question, darken the bubble corresponding to the correct integer/s in the ORS

Full Marks : +4 If only the bubble corresponding to the correct option is darkened fully.

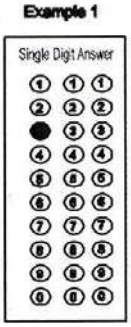
Zero Marks : 0 If none of the bubbles is darkened

Negative Marks : No negative mark for incorrect answer

CORRECT METHOD FOR MARKING SECTION 'B' QUESTIONS

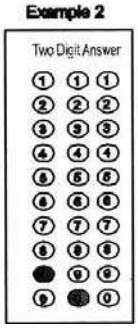
If Single Digit Answer

If answer is 3



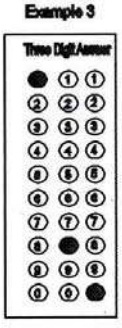
If Two Digit Answer

If answer is 90



If Three Digit Answer

If answer is 180

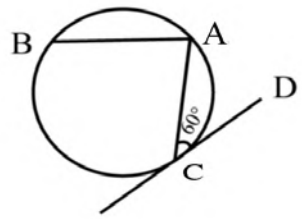


SECTION A - MATHEMATICS

51. $6\sin 30° + 2\cos 30°$ is

1) $1+3\sqrt{3}$ 2) $3+\sqrt{3}$ 3) $2+3\sqrt{3}$ 4) $3+2\sqrt{3}$

52. In the figure AB = AC and $\overline{CD}$ is a tangent at C. If $\angle ACD = 60°$, then $\angle BAC$ is



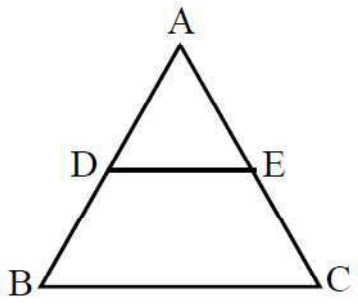
1) 50° 2) 55° 3) 60° 4) 65°

53. N_i is a two digit number formed by the digits 1, 2, 3, 4 and 5, with repetition is allowed, that is $N_1 = 11$ and $N_{25} = 55$. Let $S(N_i)$ denote the sum of the digits of N_i. Then $S(N_1) + S(N_2) + ... + S(N_{25})$ is

1) 225 2) 175 3) 200 4) 150

SPACE FOR ROUGH WORK

54. From the adjacent figure of triangle ABC, DE||BC and $\frac{AD}{DB}=\frac{3}{5}$. If AC = 16, then EC is



1) 10 2) 12 3) 11 4) 14

55. A field ABC is in the form an equilateral triangle. There are two pillers AP of height 80m and BQ of height 20m are placed at two corner of the field ABC at A and B. If is given that $\angle ACP$ and $\angle BCQ$ are complementary to each other $(\text{ie, } \angle ACP+\angle BCQ=90°)$. If D be a point on AB, so that $\angle BDQ$ is equal to $\angle ADP$. Then AD × DB is

1) 144 2) 256 3) 216 4) 284

SPACE FOR ROUGH WORK

56. Equations of three straight lines are given below $L_1 : 3x - y = 5$, $L_2 : 4x + y = 9$ and $L_3 : x + 2y - 11 = 0$. The lines L_2, L_3 intersect at A (a, p); L_1, L_2 intersect at B(b, q) and L_3, L_1 intersect at C(c, r). If $k = \frac{a^2 + b^2 + c^2}{p - 2q + r}$ and $l = \frac{a + b + c + 3}{p^2 - r^2}$ then which of the following is not TRUE?

1) $7k + 3l = 17$

2) $5k - 6l = 4$

3) $4k + 3l = 10$

4) $3k + 2l = 8$

57. In the figure O is centre of the circle and $\angle AOB = 102°$. Then $\angle P + \angle Q + \angle R$ is

1) 200°

2) 183°

3) 165°

4) 153°

SPACE FOR ROUGH WORK

58. A six digit number 71521K is divisible by 3 and 5 then K is

1) 2 2) 0

3) 5 4) 3

59. If $m^2 - 7m + 1 = 0$ then $m + \frac{1}{m}$ is

1) 7 2) 5

3) 3 4) 1

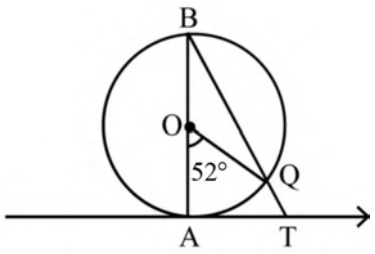
60. Which rational expression should be added with $3x^2 + 2x + 1$ to get $4x^2 + 5x + 3$?

1) $x^2 + 3x - 2$ 2) $x^2 - 3x + 2$

3) $x^2 + 3x + 2$ 4) $x^2 - 3x - 2$

SPACE FOR ROUGH WORK

61. In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 52°$, then the degree measure of $\angle ATQ$ is .....



1) 65°

2) 46°

3) 56°

4) 64°

62. The hypotenuse of a right triangle is 26 cm and its perimeter is 60 cm. Then area of the triangle is

1) 128 cm^2

2) 120 cm^2

3) 180 cm^2

4) 182 cm^2

SPACE FOR ROUGH WORK

63. What is the remainder, when $x^2 + 1$ is divided by $x + 1$?

1) 0 2) 2

3) 1 4) 3

64. If $x + k$ is a factor of $x^3 + kx^2 - 2kx - k - 6$, then positive value of k is

1) 2 2) 1

3) 3 4) $\frac{3}{2}$

65. 19^{th} term of the sequence 1, 4, 7, 10 ..... is

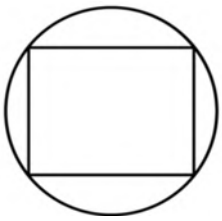
1) 55 2) 54

3) 56 4) 57

SPACE FOR ROUGH WORK

SECTION B - MATHEMATICS

66. A circle is circumscribed a square of perimeter 40 cm as in the following figure. If diameter of the circle is $k\sqrt{2}$, then k is



67. Sum of all prime numbers less than 10 is

68. Coefficient of x in $(x + 3)^2 - (x - 3)^2$ is

69. The number of ordered pair (x,y) satisfy the equations $7x - y = 16$ and $5x + y = 20$, is

70. If $x - 1$ is a factor of $2x^3 + \lambda x^2 - 8x - 11 = 0$, then the value of '$\lambda$' is

71. Sum of LCM and HCF of 24 and 33 is

SPACE FOR ROUGH WORK

72. Coefficient of x in the expression $\frac{x^2-4}{x-2}$ is

73. Value of $\left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)$ is

74. If $76^2 + 56^2 + 75^2 - 44^2 - 25^2 - 24^2 = 100K$, then the value of K is

75. If sum of three consecutive terms of an arithmetic progression is 18. Then the middle term is

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

IIT/AIIMS SCREENING TEST - 05-10-2025

QUESTION BOOKLET CODE

D

P + C + M - ANSWER KEY

PHYSICS

1. 2
2. 4 Velocity of sound doesnot depend on frequency
3. 2 $m = \frac{-V}{u}; \frac{-9}{3} = \frac{(3+x)}{x}$

   $3x = 3x;\ x = \frac{3}{2} = 150\ \text{cm}$

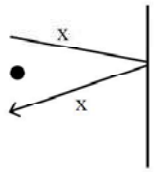
   Distance from wall to mirror = 3 + x = 300 + 150 = 450 cm
4. 1 Minimum when all connected in parallel $R = \frac{r}{10}$
5. 4 Using right hand rule
6. 4 At earth centre $F_G = 0 \Rightarrow = 0$
7. 1 To get equal voltage appliances are connected in parallel
8. 3 $F_{net} = 0$. So the boat remain stationary
9. 4 The air resistance reduce the speed of satellite that unbalance the gravitational and centripetal forces. This cause the body to accelerate downward because gravitation force become greater than centripetal force. The velocity downward increase and velocity on sidewise decrease. Since gravitational force is greater than resistance. Its net velocity (speed) will increase so its KE increase.
10. 2 $F_{net} = 0$, $W = F_{net}.d = 0$
11. 1 $f = R/2 = \frac{25}{2} = 12.5$
12. 2 $\Delta s = (50 - 20) = 30$
13. 3 $g = 10\frac{m}{s^2} = \frac{10 \times (10^{-3}\,\text{km})}{\left(\frac{1}{3600}\,\text{h}\right)} = 10 \times 3600 \times 3600 \times 10^{-3}\,\text{kmh}^{-2}$

    Therefore, $g = 129600\ \text{kmh}^{-2}$
14. 4 Displacement is a vector quantity so it has a definite direction
15. 1 The phenomenon of splitting the light is called dispersion of light
16. 100 $Wg = Fg \times d = mg \times 2 = 5 \times 10 \times 2 = 100$
17. 5 $I = \frac{q}{t} = \frac{50}{10} = 5\ \text{sec}$

18. 6 $g_{moon} = g_{earth}/6$

$60 = m \times 10;\ m = 6\ kg$

19. 170 Sound travel 2x distance where x is the distance between man and cliff



$V = d/t \Rightarrow 340 = \frac{2x}{1} \Rightarrow 2x = 340;\ x = 170$

20. 20 Image and object is same size when object is at 2F. $2 \times 10 = 20$

21. 25 $a = \frac{F}{m} = \frac{50}{20} = 25$

22. 0 Resistance across ideal ammeter = 0

23. 10 In series combination $R = R_1 + R_2 = 4 + 6 = 10\Omega$

24. 50 $P = F.V = 5 \times 10 = 50$

25. 0

SPACE FOR ROUGH WORK

CHEMISTRY

26. 3 The balanced chemical equation is $4NH_{3(g)} + 5O_{2(g)} \longrightarrow 4NO_{(g)} + 6H_2O_{(g)}$
27. 4 X is amphoteric in nature and electropositive
28. 1 Butanone ie $CH_3COCH_2CH_3$ is a ketone
29. 4 The compound is HCl.
30. 1 A is suspension as particles are visible to naked eye and settle down
C is solution as beam of light is invisible in it
B and D are colloids as particles are invisible and beam of light visible.
31. 4 Definition of molecule
32. 1 (i) decomposition (ii) Combination (iii) Combustion (iv) Double displacement
33. 2 Hydrogenation of vegetable oils is addition reaction
34. 3 Bromine is liquid at 298 K
35. 3 Assertion is correct but reason is wrong
36. 2 Alkali catalysed hydrolysis of ester is called saponification

37. 3
38. 1 Cinnabar (HgS) is an ore of mercury
39. 4 E.C. of $_{12}Mg$ is 2, 8, 2
40. 4 $^{x}_{y}A$ and $^{p}_{q}B$ are isotopes ; y = q since atomic number is the same
41. 216 Washing soda is $Na_2CO_3.10H_2O$
x = 36
Baking soda is $NaHCO_3$
y = 6
42. 5 Mg, Zn, Fe, Pb and H_2 can displace Cu from $CuSO_4$ solution

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SPACE FOR ROUGH WORK

43. 2 Only (ii) and (iii) are correct statements
44. 8 E.C. of $_{10}Ne$ is 2, 8
45. 4 Milk of magnesia, pure water, blood, NaOH (aq)
46. 5 CO_2 and NO_2 are acidic. CO, NO and H_2O are neutral
47. 3 N_2, O_2 and CO_2 are gases diamond, Au and Ag are solids.
48. 342 Aluminium sulphate is $Al_2(SO_4)_3$
49. 2 Acetic acid and urea are organic compounds
50. 2 Hydrogen molecule is H_2

MATHEMATICS

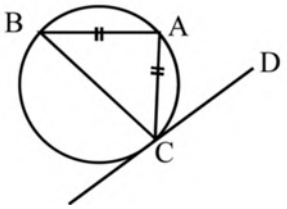
51. 2

52. 3 Given $\angle ACD = 60°$

$\therefore \angle ABC = 60°$

$\therefore \angle ACB = 60°$ Since $AB = AC$

$\therefore \angle BAC = 60°$

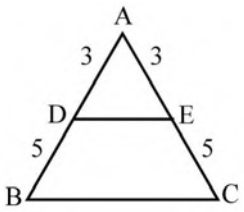


53. 4 Here unit and tens places of each digit repeats 5 times
Therefore sum of all digits = $5(1 + 2+ 3+4+5) + 5(1 + 2 + 3 + 4 + 5) = 5 \times 15 + 5 \times 15$
$= 75 + 75 = 150$

SPACE FOR ROUGH WORK

54. 1 $\dfrac{AD}{DB}=\dfrac{AE}{EC}=\dfrac{3}{5}\Rightarrow\dfrac{AE+EC}{EC}=\dfrac{3+5}{5}$

$\therefore\dfrac{AC}{EC}=\dfrac{8}{5}\Rightarrow EC=\dfrac{AC\times5}{8}=\dfrac{16\times5}{8}=10$



55. 2

In $\Delta PAC,\ \tan\alpha=\dfrac{80}{a};\ \tan\beta=\dfrac{20}{a}$

where, $\alpha=\angle ACP,\ \beta=\angle BCQ;$ Given $\alpha+\beta=90°;\beta=90-\alpha$

$\tan\beta=\tan(90-\alpha)=(0+\alpha)$

$\tan\alpha.\tan\beta=1$

$\dfrac{80}{a}.\dfrac{20}{a}=1\Rightarrow a^2=100;\ a=40$

Let $AD=x$ then $BD=40-x$

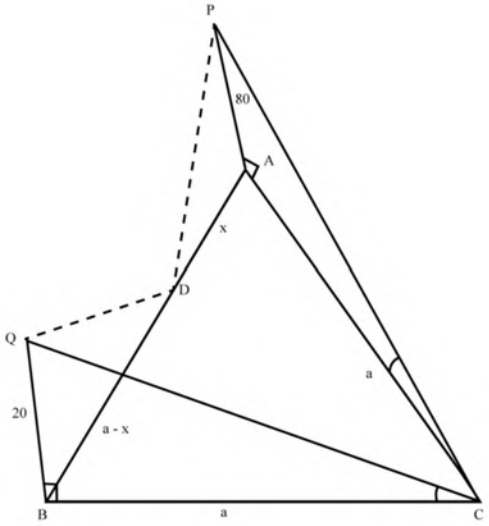
$\tan\angle ADP=\dfrac{80}{x}\ \tan\angle BDQ=\dfrac{20}{40-x}$

Given $\angle ADP=\angle BDQ\Rightarrow\dfrac{80}{x}=\dfrac{20}{40-x}$

$\Rightarrow 4(40-x)=x;\ 160-4x=x\Rightarrow 5x=160;x=32$

$\therefore$ AD = 32, then $BD=40-32=8$

$\therefore AD.DB=32\times8=256$

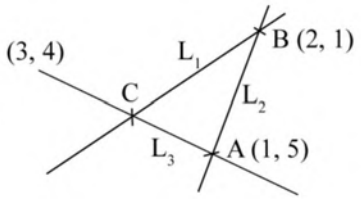


SPACE FOR ROUGH WORK

56. 3 $L_1 : 3x - y = 5;\ L_2 : 4x + y = 9;\ L_3 : x + 2y = 11$

Solving L_2 and L_3

$$8x + 2y = 18$$
$$x + 2y = 11$$
$$7x \quad \Rightarrow 7 \Rightarrow x = 1;\ y = 5 \Rightarrow A(1,5)$$



Solving L_1 and L_3

$$6x - 2y = 10$$
$$x + 2y = 11$$
$$7x = 21 \Rightarrow x = 3 \text{ and } y = 4 \Rightarrow C(3,4)$$

Solving L_1 and L_2

$$3x - y = 5$$
$$4x + y = 9$$
$$7x = 14 \Rightarrow x = 2 \text{ and } y = 1 \Rightarrow B(2,1)$$

$A(1, 5) \Rightarrow a = 1;\ p = 5$
$B(2, 1) \Rightarrow b = 2;\ q = 1$
$C(3, 4) \Rightarrow c = 3;\ r = 4$

SPACE FOR ROUGH WORK

$$K = \frac{a^2+b^2+c^2}{p-2q+r} = \frac{1^2+2^2+3^2}{5-2+4} = \frac{14}{7} = 2$$

$$\ell = \frac{a+b+c+3}{p^2-q^2} = \frac{1+2+3+3}{25-16} = \frac{9}{9} = 1$$

1) $7K + 3l = 14 + 3 = 17$ true
2) $5K - 6l = 10 - 6 = 4$ true
3) $3K + 2l = 6 + 2 = 8$ true
4) $4K + 3l = 8 + 3 = 11$ false

57. 4 $\angle P = \angle Q = \angle R = \frac{1}{2}\angle AOB = 51; \therefore \angle P + \angle Q + \angle R = 153°$

58. 3 K is 0 or 5 and $7 + 1 + 5 + 2 + 1 + K = M(3)$,
When K = 0, sum of digits $\neq$ M(3); K=5 sum of digits = M(3)
$\Rightarrow$ K = 5

59. 1 $m^2 - 7m + 1 = 0 \Rightarrow m + \frac{1}{m} = 7$

60. 3 $P(x) = \left(4x^2 + 5x + 3\right) - \left(3x^2 + 2x + 1\right) = x^2 + 3x + 2$

61. 4 $\angle OBQ = \frac{1}{2}\angle AOQ = 26°$
In ΔABT, $\angle OBQ + \angle ATQ = 90° \Rightarrow ATQ = 64°$

SPACE FOR ROUGH WORK

62. 2

$x + y + 26 = 60$

$x + y = 34$

$x^2 + y^2 = 26^2 = 676$

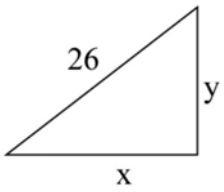
$\therefore (x + y)^2 = 34^2$

$x^2 + y^2 + 2xy = 1156$

$2xy = 1156 - 676$

$xy = 240$

$\text{Area} = \frac{1}{2}xy = 120$



63. 2 $P(x) = x^2 + 1$, then the remainder $P(-1) = (-1)^2 + 1 = 2$

64. 1

$P(x) = x^3 + Kx^2 - 2Kx - K - 6$

$P(-K) = -K^3 + K^3 + 2K^2 - K - 6 = 0$

$\therefore 2K^2 - K - 6 = 0$

$2K^2 - 4K + 3K - 6 = 0$

$2K(K-2) + 3(K-2) = 0$

$(K-2)(2K+3) = 0 \Rightarrow K = 2, \frac{-3}{2} \Rightarrow K = 2$

SPACE FOR ROUGH WORK

65. 1 $t_n = a + (n-1)d$

$t_{19} = 1 + 18 \times 3 = 55$

66. 10 $4a = 40 \Rightarrow a = 10$

Diameter of circle = diagonal of the square $= 10\sqrt{2} = K\sqrt{2} \Rightarrow K = 10$

67. 17 $2 + 3 + 5 + 7 = 17$

68. 12 $(x + 3)^2 - (x - 3)^2 = (x^2 + 6x + 9)(x^2 - 6x - 9) = 12x$

69. 1 $7x - y = 16$ and $5x + y = 20$

Solving $x = 3$ and $y = 5$; $(x,y) = (3,5)$

70. 17 $P(x) = 2x^3 + \lambda x^2 - 8x - 11$

$P(1) = 2 + \lambda - 8 - 11 = 0$

$\Rightarrow \lambda - 17 = 0 \Rightarrow \lambda = 17$

71. 267 HCF = 3

LCM = 264, HCF + LCM = 3 + 264 = 267

72. 1 $\frac{x^2 - 4}{x - 2} = x + 2$

SPACE FOR ROUGH WORK

73. 12 $\left(2+\sqrt{2}\right)\left(2-\sqrt{2}\right)=4-2=2$

$\left(3+\sqrt{3}\right)\left(3-\sqrt{3}\right)=9-3=6$

$\therefore \left(2+\sqrt{2}\right)\left(3+\sqrt{3}\right)\left(2-\sqrt{2}\right)\left(3-\sqrt{3}\right)=2\times 6=12$

74. 114 $\left(76^2-24^2\right)+\left(56^2+44^2\right)+\left(75^2-25^2\right)=100\times 52+100\times 12+100\times 50$

$=100\left(52+12+50\right)=11400=100\ \text{K}\Rightarrow \text{K}=114$

75. 6 a–d + a + a + d = 18 $\Rightarrow$ 3a = 18, a = 6

SPACE FOR ROUGH WORK

IIT/AIIMS SCREENING TEST - 05-10-2025

QUESTION BOOKLET CODE

E

P + C + M - ANSWER KEY

PHYSICS

1. 2
2. 4
3. 2
4. 3
5. 4
6. 3
7. 2
8. 1
9. 3
10. 2
11. 1
12. 3
13. 4
14. 1
15. 1
16. 150 $F = ma = \frac{m[V-u]}{t} = \frac{10[30-0]}{2} = 150\ N$
17. 3
18. 20
19. 10
20. 50
21. 5
22. 600
23. 2
24. 5
25. 486 $m_1v_1 = m_2v_2 \therefore v_2 = \frac{18\times 6}{12} = 9ms^{-1}$

$KE = \frac{1}{2}\times 12(9)^2 = 486\ J$

CHEMISTRY

26. 4 $2Ca + O_2 \rightarrow 2CaO$ is a redox reaction
27. 1 Cu do not displace H_2 from dilute HCl
28. 1 Both Na and O^{2-} contain 10 electrons
29. 3 Number of protons = 19, Number of neutrons = 21, Number of electrons = 18
30. 4 Aqua regia dissolve both gold and platinum
31. 3 $^{11}_{27}Na$ 12 Neutrons; $^{24}_{12}Mg$ 12 Neutrons
32. 4 Gold is less reactive than silver
33. 2 Phenolphthalein is an acid-base indicator

34. 2 NH_4Cl acidic; NaCl Neutral; CH_3COONa basic
35. 2 Minerals are naturally occuring elements or compounds
36. 4 $Ca(HCO_3)_2$ is soluble in water
37. 3 CNG contain mainly CH_4
38. 3 Liquid-Liquid colloid is emulsion
39. 2 During anodising O_2 gas is liberated at anode
40. 177 200g solution contain 36 g salt

$$\text{Vol. of } 200g = \frac{200}{1.13} = 176.99 \approx 177 \text{ cm}^3$$

41. 21 $(NH_4)_2SO_3$; $\frac{2 \times 14 \times 100}{132} = 21.21$
42. 4 Acetic acid CH_3COOH
43. 4 Lead, Copper, Silver and Gold do not react with water
44. 0 24 Carat gold is pure gold
45. 2 Glucose and ethanol solutions do not conduct electricity
46. 2 Copper and silver are found in free state as well as in combined state as sulphide or oxide ores
47. 3 Oxygen, Carbon and sulphur are non metals
48. 4 CaO, ZnO, Na_2O and Al_2O_3 react with acids to form salts.
49. 5 E.C of elements with Z = 15 is 2, 8, 5
50. 18 No.of electrons in K shell = 2; L shell = 8; M shell = 18

MATHEMATICS

51. 1 $(x + 2)(x^2 + 1) - (2x + 3)(x - 1) = (x^3 + x + 2x^2 + 2) - [2x^2 - 2x + 3x - 3]$
$= x^3 + 2x^2 + x + 2 - 2x^2 + -x + 3 = x^3 + 5$; $\therefore$ coefficient x = 0

SPACE FOR ROUGH WORK

52. 3 $ac + bc = (a+b)c = \left[\frac{\sqrt{3}+1}{\sqrt{2}+1} + \frac{\sqrt{3}+1}{\sqrt{2}-1}\right]\left(\sqrt{6}-1\right)$

$$= \left[\frac{\left(\sqrt{3}-1\right)\left(\sqrt{2}-1\right)+\left(\sqrt{3+1}\right)+\left(\sqrt{2}+1\right)}{2-1}\right]\left(\sqrt{6}-1\right)$$

$$= \left[\frac{\sqrt{6}-\sqrt{3}-\sqrt{2}+1+\sqrt{6}+\sqrt{3}+\sqrt{2}+1}{1}\right]\left(\sqrt{6}-1\right)$$

$$= \left(2\sqrt{6}+2\right)\left(\sqrt{6}-1\right) = 2\left(6-1\right) = 10$$

53. 4 Sum of roots $= 6 = \alpha + \beta \ \therefore 2 + \beta = 6 \Rightarrow \beta = 4$

54. 3 $2 + 3 = 5$ is not even $\Rightarrow$ (1) is false

$2^2 = 4$ is not odd $\Rightarrow$ (2) is false

$2 + 3 = 5$ is odd $\Rightarrow$ (4) is false

But 2 is true

55. 3 Ratio of area of two similar triangle is ratio of square of the heights

$$\frac{\Delta_1}{\Delta_2} = \frac{h_1^2}{h_2^2} \Rightarrow \frac{h_1^2}{h_2^2} = \frac{4}{1} \ \therefore \frac{h_1}{h_2} = 2 \Rightarrow h_1 = 2h_2 = 2\times 6 = 12$$

56. 4 $P(-1) \neq 0 \ P(-2) \neq 0 \ P(-3) \neq 0$

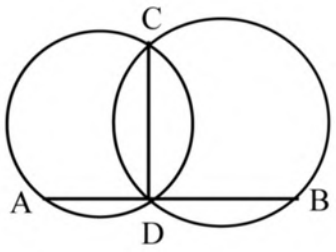
But $P(3) = 0 \Leftrightarrow x - 3$ is a factor

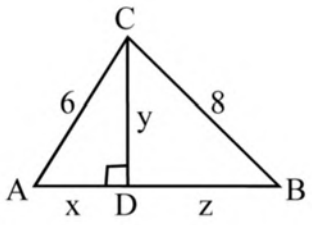
57. 1 $a = 7; d = 13 - 7 = 6$

$t_{27} = a + (n-1)d = 7 + (27-1) \times 6 = 163$

SPACE FOR ROUGH WORK

58. 2 Since AB $\perp$ CD, AC is diameter. Similarly BC is also a diameter.





$x^2 + y^2 = 36$ ..... (1)
$y^2 + z^2 = 64$ .....(2)
(1) - (2) $\therefore$ $z^2 - x^2 = 28 \Rightarrow (z + x)(z - x) = 28$
$\therefore$ $(AD + DB)(DB - AD) = 28$
$AB \times 2 = 28 \Rightarrow AB = 14$

59. 4 $A - B = (27^2 - 21^2) + (24^2 - 23^2) + (26^2 - 25^2) + (28^2 - 27^2) + (30^2 - 29^2)$
$= 43 \times 1 + 47 \times 1 + 51 \times 1 + 55 \times 1 + 59 \times 1 = 43 + 47 + 51 + 55 + 59 = 255$

60. 1 $\dfrac{\sin 30°}{\cos 60°} = \dfrac{1/2}{1/2} = 1$

61. 1 $101 \times 99 + K = (100 + 1)(100 - 1) + K = 10^4 - 1 + K$
$101 \times 99 + K = 10^4 \Rightarrow K = 1$

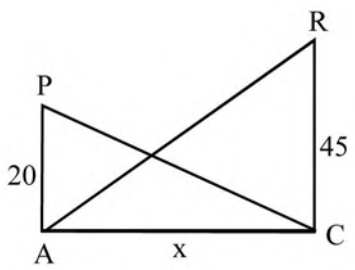
SPACE FOR ROUGH WORK

62. 2 $\alpha = 4$ and $\beta = 2 \Rightarrow \frac{\alpha}{\beta} = \frac{4}{2} = 2$

63. 2

Since $\angle AOB = \angle BOC = \angle COA \Rightarrow \angle AOB =$

$\therefore AB = BC = CA$ is ΔABC is equilateral



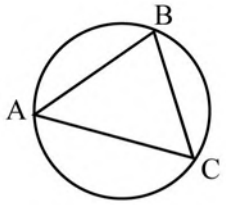
$\tan \angle CPA = \frac{20}{x}$

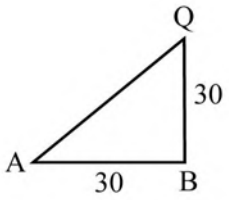
$\tan \angle CRA = \frac{45}{x}$

$\angle CPA + \angle CRA = 90°$

$\angle CPA = 90° - \angle CRA$

$\therefore \tan \angle CPA = \cot \angle CRA$





$\Rightarrow \frac{20}{x} = \frac{x}{45} \Rightarrow x^2 = 900;\ x = 30 = AB = AC =$

In $\Delta AQB,\ AB = 30,$ Given $BQ = 30$

$\therefore \tan \angle AQB = \frac{30}{30} = 1 \Rightarrow \angle AQB = 45°$

SPACE FOR ROUGH WORK

64. 2 $\angle A = 70 \Rightarrow \angle B = \angle C \Rightarrow \angle C = \frac{180-70}{2} = 55$

$\angle P - 80 \Rightarrow \angle Q = \angle R \Rightarrow \angle Q = \frac{180-80}{2} = 50$

$\angle QDC = 180 - (55 + 50) = 180 - 105 = 75$

65. 4 Let $p = \frac{1}{3x+2y}$ and $q = \frac{1}{2x+y}$

$\therefore 7p + 2q = \frac{3}{2} \Rightarrow 14p + 4q = 3$.....(1)

$p + q = \frac{11}{28} \Rightarrow 28p + 28q = 11$.....(2)

$\therefore 28p + 28q = 11$

$28p + 8q = 6$

$20q = 5 \Rightarrow q = \frac{1}{4}$

SPACE FOR ROUGH WORK

$$p+\frac{1}{4}=\frac{11}{28}\Rightarrow p=\frac{11}{28}-\frac{1}{4}=\frac{11-7}{28}=\frac{4}{28};\ p=\frac{1}{7}$$

$$\therefore \frac{1}{7}=\frac{1}{3x+2y}\Rightarrow 3x+2y=7$$

$$\frac{1}{4}=\frac{1}{2x+y} \quad \Rightarrow 2x+y=4$$

$$\Rightarrow 4x+2y=8$$

$$\begin{array}{r} 3x+2y=7 \\ \hline x= \quad 1 \\ y= \quad 2 \end{array}$$

$$\therefore (5x+3y)^2+(2x-y)^2=(5+6)^2+(2-2)^2=121+0=121$$

66. 39 $x=\frac{17+23}{2}=15\Rightarrow 20-1=39$

67. 0 $(x+y)^2=(x-y)^2\Rightarrow x^2+2xy+y^2=x^2-2xy+y^2\Rightarrow 4xy=0;\ xy=0$

$\therefore x^3y+yx^3=xy(x^2+y^2)=0$

68. 60 $(5+\sqrt{5})^2+(5-\sqrt{5})^2=25+5-20\sqrt{5}+25+5+-10\sqrt{5}=60$

SPACE FOR ROUGH WORK

69. 7 $x + 2y = 5 \Rightarrow 6x + 12y = 30$

$3x + 12y = 9$ $\quad \dfrac{3x + 12y = 9}{3x \quad = 21 \Rightarrow x = 7}$

70. 3 $x - 1$ is factor of $x^3 + ax^2 + bx - 4 \therefore P(1) = 0 \Rightarrow 1 + a + b - 4 = 0;\ a + b = 3$

71. 1 $\cos^2\theta + \sin^2\theta = 1 \Rightarrow \sin^2 33° + \cos^2 33° = 1$

72. 60 Since ΔABC is an equilateral

$\angle A = 60°;\ \therefore \angle BDC = \angle A° = 60°$ (angle inscribed in the same arc of a circle)

73. 145 $3^4 + 4^3 = 81 + 64 = 145$

74. 660 Product of LCM and HCF = $30 \times 22 = 660$

75. 25 $x^2 - 10x + k = x^2 - 10x + 25 + K - 25 = (x - 5)^2 + K - 25$

Since $x^2 - 10x + K$ is a perfect square $K - 25 = 0 \Rightarrow K = 25$

SPACE FOR ROUGH WORK