IIT/AIIMS SCREENING TEST - 27-12-2025

PHYSICS + CHEMISTRY + MATHEMATICS

SECTION -A (PHYSICS)

1. Energy per unit volume in a fluid flow represents

1) Pressure 2) Force 3) Thrust 4) Work

Ans: 1

2. A particle moving with a uniform acceleration along a straight line covers distance a and b in successive intervals of p and q second. The acceleration of the particle is

1) $\frac{pq(p+q)}{2(bp-aq)}$ 2) $\frac{2[bp-aq]}{pq[p+q]}$ 3) $\frac{bp-aq}{pq(p-q)}$ 4) $\frac{2(bp-aq)}{pq(p-q)}$

Ans: 2

3. A body of mass 0.05 kg is observed to fall with an acceleration of 9.5 ms^{-2}. The opposite force of air on the body is (g = 9.8 ms^{-2})

1) 0.030 N 2) 0.15 N 3) 0.015 N 4) 0

Ans. 3

4. A man squatting on the ground gets straight up and stand. The force of reaction of ground on the man during the process is

1) constant and equal to mg in magnitude

2) constant and greater than mg in magnitude

3) variable but always greater than mg

4) at first greater than mg and later becomes equal to mg

Ans. 4

5. A 50 kg girl wearing high heel shoes balances on a single heel. If the heel is circular with a diameter 1.0 cm. What is the pressure exerted on the horizontal floor? (g = 9.8 m/s^2 and $\pi = 3.14$)

1) 6.9×10^6 Pa 2) 6.2×10^6 Pa 3) 9.6×10^6 Pa 4) 9.0×10^6 Pa

Ans. 2

Pressure exerted on the horizontal floor $p = \frac{F}{A} = \frac{mg}{A} = \frac{50 \times 9.8}{78.50 \times 10^{-6}} = 6.24 \times 10^6 \text{Pa}$

6. The gravitational attraction between the two bodies increases when their masses are

1) reduced and distance of separation is reduced

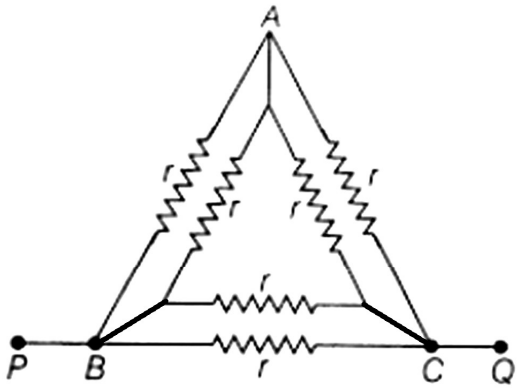
2) reduced and distance of separation is increased

3) increased and distance of separation is reduced

4) increased and distance of separation is increased

Ans. 3

7. The resistance across P and Q in the figure.



1) 2r 2) r/2 3) r/3 4) 6r

Ans. 3

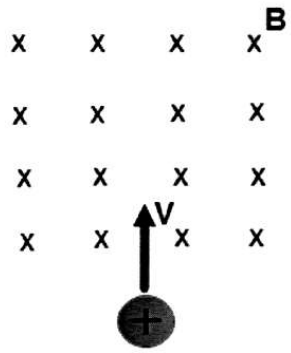
8. If charges and distance between the two point charges are reduced to half. Force between them

1) remains same 2) increases four times

3) reduces four times 4) None of the above

Ans. 1

9. A positive charge moving with a constant velocity v enters a region of a uniform magnetic field pointing into the page. What is the direction of the magnetic force on the charge?



1) Right
2) Left
3) To the bottom of the page
4) To the top of the page

Ans. 2

10. If both the velocity and acceleration of an object are negative, then the speed of the object will

1) decrease
2) be constant
3) increase
4) increase or decrease

Ans. 3

11. Sun is visible a little before the actual sunrise and until a little after the actual sunset. This is due to

1) Total internal reflection
2) Reflection
3) Polarization
4) Refraction

Ans. 4

12. A convex lens of focal length 30cm produces 5 times magnified real image of an object. What is the object distance?

1) 150 cm
2) 25 cm
3) 30 cm
4) 36 cm

Ans. 4

13. A car moves with uniform acceleration along a straight line PQR. Its speed at P and R are 5 m/s and 25 m/s respectively. If PQ : QR = 1 : 2, the ratio of the times taken by car to travel distance PQ and QR is

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

Ans. 1

14. Average acceleration is equal to .....

1) $\frac{\text{Final velocity} - \text{Initial velocity}}{\text{Time taken}}$ 2) $\frac{\text{Final velocity}}{\text{Initial velocity}}$

3) $\frac{\text{Final velocity} + \text{Initial velocity}}{\text{Time taken}}$ 4) None of these

Ans. 1

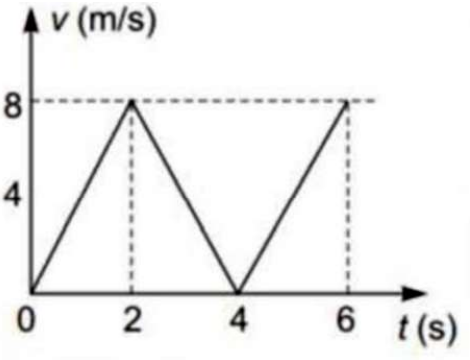
15. A bullet fired from a gun makes a small hole in a glass window, without breaking it into pieces. This is due to inertia of

1) motion 2) rest 3) direction 4) both 1 and 3

Ans. 2

SECTION -B (PHYSICS)

16. v-t graph for a particle is as shown. The distance travelled in the first 4s in meter is



Ans. 16

17. A ball of mass 0.2 kg is thrown vertically upwards by applying a force by hand. If the hand moves 0.2 m while applying a force and the ball goes upto 2m height further, then find the magnitude of the force in newton. Consider g = 10 m/s^2

Ans. 22

18. A body looses half of its velocity on penetrating 3cm in a wooden block, then how much will it penetrate (in cm) more before coming to rest?

Ans. 1

19. If two identical heaters each rated as (100 W – 220 V) are connected in parallel to 220 V, then the total power consumed in watt is .....

Ans. 200

20. A point object is placed at a distance of 30 cm from a convex mirror of focal length 30cm. The image will form at (distance should be in cm)

Ans. 15

21. Potential difference applied across a conductor of resistance 20Ω is 100 V. The current through the conductor in ampere is

Ans. 5

$$I = \frac{V}{R} = \frac{100}{20} = 5A$$

22. The kinetic energy of a particle changes from 25 J to 100 J. Work done by all the forces on the particle in joule is

Ans. 75

23. A particle of mass 10kg is moving vertically downward through a distance 2m. Work done by the gravity in joule is ($g = 10\ m/s^2$)

Ans. 200 **$W = mgh = 10 \times 10 \times 2 = 200\ J$**

24. A particle of mass 2kg is moving with 10 m/s constant velocity. The net force acting on the particle is

Ans. 0

25. Pressure exerted by water column of height 2m is $a \times 10^3$Pa. The value of a is [$g = 10\ m/s^2$]

Ans. 20 $P = h\rho g = 2 \times 10^3 \times 10 = 2 \times 10^4$ Pa

SECTION - A (CHEMISTRY)

26. In which process(es) among the following chemical change occurs?

A) Bubbling O_2 gas through water

B) Burning of wax of candle

C) Emitting of light from an electric bulb on passing electric current

D) Passing CO_2 gas through lime water

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

Ans. 4

Burning wax of candle and bubbling CO_2 through lime water both involve chemical change.

27. X is widely used as a fuel and is a major component of biogas and compressed natural gas. X is

1) Benzene 2) Ethanol 3) Methane 4) Ethanoic acid

Ans. 3 CH_4 is the major component of CNG and natural gas

28. On washing with soap a turmeric stain on the cloth turns to red because

A) Soap solution is acidic

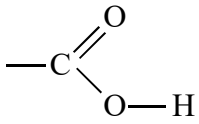
B) Soap solution is alkaline

C) Turmeric contain a natural indicator

D) Turmeric contains litmus

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

Ans. 4 Soap is basic in nature, turmeric is a natural indicator

29.  is the functional group of

1) Carboxylic acid 2) Aldehyde

3) Ketone 4) Alcohol

Ans. 1 –COOH is the functional group of carboxylic acids

30. The true statements among the following are:

A) Gold is the most ductile metal, a wire of about 2km length can be drawn from one gram of gold

B) Best conductors of heat are silver and copper

C) Lead and mercury are comparatively poor conductors of heat

D) All metals except mercury are solids at room temperature (298 K)

1) A and B only

2) A and C only

3) B and D only

4) All A, B, C and D

Ans. 4 All statements are correct

31. The incorrect statements among the following are

A) Copper (II) oxide is blue in colour

B) Aluminium oxide react with acids such as HCl to form salt and water

C) Aluminium oxide react with base such as NaOH to form salt and water

D) Sodium oxide and potassium oxide are insoluble in water

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

Ans. 3 CuO is black, Na_2O and K_2O are water soluble

32. Which among the following is insoluble in water?

1) Sodium chloride (NaCl)

2) Ethanoic acid (CH_3COOH)

3) Barium chloride ($BaCl_2$)

4) Silver chloride (AgCl)

Ans. 4 Silver chloride is insoluble in water

33. Which among the following is a dye that is purple in its aqueous solution?

1) Phenolphthalein 2) Litmus 3) Methyl orange 4) Tincture iodine

Ans. 2 Litmus is a purple dye

34. The type of medicine used for treating indigestion is

1) Antibiotic 2) Analgesic 3) Antiseptic 4) Antacid

Ans. 4 Antacid is used in treating indigestion

35. Equal lengths of cleaned magnesium (Mg) ribbon are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A while acetic acid (CH_3COOH) is added in test tube B. Amount and concentration taken for both the acids are the same. It is observed that

1) reaction is more vigorous in test tube A

2) reaction is more vigorous in test tube B

3) reaction occurs with equal vigour in both test tube A and test tube B

4) reaction occurs in test tube B but no reaction occurs in test tube A

Ans. 1 Reaction is more vigorous with hydrochloric acid

36. Which among the following sets contain molecules with double bonds or triple bonds?

A) H_2, Br_2, H_2O, NH_3 B) F_2, O_2, CO_2, Cl_2 C) CO_2, N_2, H_2, NH_3 D) NH_3, Cl_2, CH_4, CCl_4

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

Ans. 2 O_2 and CO_2 contain double bonds N_2 contains triple bond

37. The gas produced when Manganese dioxide is treated with concentrated hydrochloric acid is?

1) Cl_2 2) O_2 3) H_2 3) $MnCl_4$

Ans. 1 Cl_2 gas is liberated $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

38. An element X has electronic configuration 2, 8, 8, 2. The formula and nature of oxide of X are respectively

1) XO, neutral 2) XO_2 , acidic 3) XO_2, amphoteric 4) XO, Basic

Ans. 4 X is a metal, its valency is 2. Its oxide is XO and it is basic

39. A colourless solution changes gradually blue when some copper turnings are put into it. The solution is most likely to be

1) Ferrous sulphate ($FeSO_4$) solution
2) Magnesium nitrate [$Mg(NO_3)_2$] solution
3) Silver nitrate ($AgNO_3$) solution
4) Zinc sulphate ($ZnSO_4$) solution

Ans. 3

The relative reactivities of metals follow the order Mg, Zn, Fe, Cu, Ag. Copper can displace Ag from $AgNO_3$ solution

40. Composition of three atomic particles X, Y and Z are given

Atomic particle	X	Y	Z
No.of Protons	8	7	7
No.of Neutrons	8	9	9
No.of Electrons	8	7	8

What is the relation between X and Y and between Y and Z?

1) X and Y are isotopes; Y and Z are isotopes
2) X and Y are isotopes; Y is an ion of Z
3) X and Y are isobars; Z is an ion of Y
4) No relation between X and Y, Y and Z are the same

Ans. 3

Mass number of X and Y same

Atomic number of Y and Z same

Y is neutral : Z is Y^-

SECTION - B (CHEMISTRY)

Some useful data : Atomic mass of H = 1u, C = 12u, N = 14u, O=16u, F = 19u, Na = 23u, Mg = 24u, Al = 27u, P = 31u, S = 32u, Cl = 35.5u, K = 39u, Ca = 40u

41. Sum of protons, neutrons and electrons present in an atom of Deuterium is .....

Ans. 3 Deuterium is $^{2}_{1}H$

42. The mass percentage of nitrogen in magnesium nitride is ..... (Nearest integer)

Ans. 28 Magnesium nitride is Mg_3N_2; % of nitrogen = $\frac{28}{100} \times 100 = 28\%$

43. How many atoms are there in the reactant side of the balanced equation:

$aFe(s) + bH_2O(g) \rightarrow cFe_3O_4(s) + dH_2(g)$

Ans. 15 The balanced equation is $3Fe(s) + 4H_2O(g) \rightarrow Fe_3O_4(s) + 4H_2(g)$

44. The number of atoms present in a molecule of acetic acid is .....

Ans. 8 Acetic acid is CH_3COOH

45. How many of the following are different forms of calcium carbonate?

i) Tooth enamel	ii) Lime stone	iii) Slaked lime
iv) Cinnabar	v) Chalk	vi) Coke
vii) Gypsum	viii) Marble	ix) Soda ash

Ans. 3 Lime stone, Chalk and marble are different forms of calcium carbonate

46. How many of the following are metals?

i) Iron (Fe)	ii) Iodine (I)	iii) Calcium (Ca)
iv) Carbon (C)	v) Lead (Pb)	vi) Sulphur (S)
vii) Zinc (Zn)		

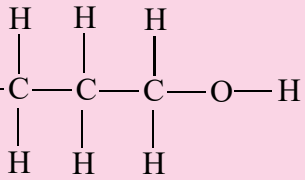
Ans. 4 Fe, Ca, Pb and Zn are metals

47. How many metals among the following are never found in nature as free elements?

i) Copper (Cu)	ii) Potassium (K)
iii) Aluminium (Al)	iv) Silver (Ag)
v) Sodium (Na)	vi) Magnesium (Mg)
viii) Gold (Au)	viii) Calcium (Ca)

Ans. 5 K, Na, Ca, Mg and Al are so reactive that they are nerver found in nature as free elements

48. The total number of co-valent bonds present in a molecule of propanol is .....

Ans. 11 Propanol is 

49. The molecular mass (formula unit mass) of gypsum is ..... u

Ans. 172 Gypsum is $CaSO_4.2H_2O$

50. In how many of the following reaction(s) an element is produced (formed) as product?

i) $Pb(s) + CuCl_2(aq) \longrightarrow Product(s)$

ii) $2AgBr(s) \xrightarrow{\text{sun light}} Product(s)$

iii) $2Pb(NO_3)_2(s) \xrightarrow{\text{heat}} Product(s)$

iv) $2FeSO_{4(s)} \xrightarrow{\text{heat}} Product(s)$

v) $Zn(s) + H_2SO_4(aq) \longrightarrow Product\ (s)$

vi) $2HgO(s) \xrightarrow{\text{heat}} Product(s)$

Ans. 5

$2FeSO_4(s) \xrightarrow{\text{heat}} Fe_2O_3(s) + SO_2(g) + SO_3(g)$. **I**n all the other reactions element(s) is/are formed as product.

SECTION - A (MATHEMATICS)

51. If $P(x) = x^2 + x + 1$ then $\dfrac{P(2)+P(-2)}{P(1)-P(-1)} =$

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

Ans. 4 **$P(x) = x^2 + x + 1$;**

$P(1) = 1 + 1 + 1 = 3$; $P(-1) = 1 - 1 + 1 = 1$

$P(2) = 4 + 2 + 1 = 7$; $P(-2) = 4 - 2 + 1 = 3$

$$\frac{P(2)+P(-2)}{P(1)-P(-1)} = \frac{7+3}{3-1} = \frac{10}{2} = 5$$

52. If $\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$ are in AP, then the value of x is

1) 1/2 2) 0 3) 1 4)–1

Ans. 3

$\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$ are in a.P

$\therefore \frac{2}{x+3} = \frac{1}{x+2} + \frac{1}{x+5}; \frac{2}{x+3} = \frac{x+5+x+2}{(x+2)(x+5)}; \frac{2}{x+3} = \frac{2x+7}{x^2+7x+10}$

$2(x^2+7x+10) = (x+3)(2x+7)$

$2x^2+14x+20 = 2x^2+7x+6x+21; 14x+20 = 13x+21; x = 1$

53. If $7\sin^2\theta + 3\cos^2\theta = 4$, then $\tan\theta =$

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

Ans. 1

$7\sin^2\theta + 3\cos^2\theta = 4 \Rightarrow 7\sin^2\theta + 3(1-\sin^2\theta) = 4$

$7\sin^2\theta + 3 - 3\sin^2\theta = 4$

$4\sin^2\theta = 1 \Rightarrow 2\sin\theta = \pm 1$

$\therefore \sin\theta = \frac{1}{2}$ or $\sin\theta = \frac{-1}{2}$

$\therefore \theta = 30° \Rightarrow \tan\theta = \frac{1}{\sqrt{3}}$

54. If $a : b = 4 : 5$, then $\frac{5a-b}{10a+3b}$ is

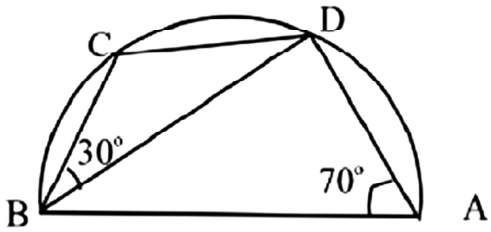
1) $\frac{3}{11}$ 2) $\frac{5}{11}$ 3) $\frac{2}{11}$ 4) $\frac{1}{11}$

Ans. 1

$$a : b = 4 : 5 \Rightarrow \frac{a}{b} = \frac{4}{5}$$

$$\frac{5a-b}{10a+3b} = \frac{5\left(\frac{a}{b}\right)-1}{10\left(\frac{a}{b}+3\right)} = \frac{5\times\frac{4}{5}-1}{10\times\frac{4}{5}+3} = \frac{4-1}{8+3} = \frac{3}{11}$$

55. In the given figure AB is the diameter, $\angle BAD = 70°$ and $\angle DBC = 30°$. Then $\angle BDC$ is



1) 45° 2) 25° 3) 30° 4) 40°

Ans. 4 $\angle BDA = 90°$, since AB is diameter

$\angle BAD + \angle BCD = 180° \Rightarrow \angle BCD = 180 - 70 - 110°$

In ΔBCD, $\angle CBD + \angle BCD + \angle CDB = 180°$; $30 + 110 + \angle BDC = 180°$; $\angle BDC = 40°$

56. If $\frac{x}{y}=\frac{6}{5}$ then $\frac{x^2+y^2}{x^2-y^2}$ is

1) $\frac{61}{11}$ 2) $\frac{25}{36}$ 3) $\frac{11}{61}$ 4)

Ans. 1

$$\frac{x}{y}=\frac{6}{5};\ \frac{x^2+y^2}{x^2-y^2}=\frac{\left(\frac{x}{y}\right)^2+1}{\left(\frac{x}{y}\right)^2-1}=\frac{\frac{36}{25}+1}{\frac{36}{25}-1}=\frac{36+25}{36-25}=\frac{61}{11}$$

57. If N = 10x + y and M = 10y + x are two digit natural numbers. If both N and M are prime then which among the following is not the value of M + N

1) 44 2) 55 3) 88 4) 110

Ans. 2 There are three posibilities

1) N = 13 M = 31 N + M = 44

2) N = 17 M = 71 N + M = 88

3) N = 37 M = 73 N + M = 110

There for N + M may be 44, 88, 110

58. First term of an A.P. is 5, the common differences is 7, find the 22nd term of the A.P.

1) 132 2) 154 3) 160 4) 152

Ans. 4 $\mathbf{t_{22} = 5 + 21 \times 7 = 5 + 147 = 152}$

59. Which of the following numbers is an irrational number?

1) $\sqrt{16}-4$ 2) $\left(3-\sqrt{3}\right)\left(3+\sqrt{3}\right)$ 3) $\sqrt{5}+3$ 4) $-\sqrt{25}$

Ans. 3

$\sqrt{16}-4=4-4-0$ rational

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

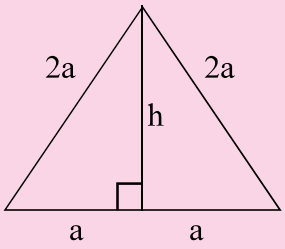
$-\sqrt{25}=-5$ is rational

$\sqrt{5}+3$ is irrational

60. Altitude of an equilateral triangle of side 2a is

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

Ans. 3 $a^2 + h^2 = (2a)^2$; $h^2 = 3a^2$; $h = \sqrt{3}\,a$



61. The value of 'a' for which (x + a) is a factor of the polynomial $x^3 + ax^2 - 2x + a + 6$ is

1) 4 2) 2 3) –4 4) –2

Ans. 4

When P(–a) = 0, x + a is a factor of P(x)

$P(x) = x^3 + ax^2 - 2x + a + b$

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

62. If x_1, x_2, x_3 and x_4 are 4 natural numbers such that

$\sqrt{x_1-1}+3\sqrt{x_2-9}+5\sqrt{x_3-25}+7\sqrt{x_4-49}=\frac{x_1+x_2+x_3+x_4}{2}$ then the value of $x_1-x_2-x_3+x_4$ is

1) 52 2) 32 3) 48 4) 86

Ans. 2

Given $\sqrt{x_1-1}+3\sqrt{x_2-9}+5\sqrt{x_3-25}+7\sqrt{x_4-49}=\frac{x_1+x_2+x_3+x_4}{2}$

$\Rightarrow 2\sqrt{x_1-1}+6\sqrt{x_2-9}+10\sqrt{x_3-25}+14\sqrt{x_4-49}=x_1+x_2+x_3+x_4$

$\therefore \left(x_1-2\sqrt{x_1-1}\right)+\left(x_2-6\sqrt{x_2-9}\right)+\left(x_3-10\sqrt{x_3-25}\right)+\left(x_4-14\sqrt{x_4-49}\right)=0$

Now $x_1-2\sqrt{x_1-1}=(x_1-1)-2\sqrt{x_1-1}+1=\left(\sqrt{x_1-1}-1\right)^2$

$x_2-6\sqrt{x_2-9}=(x_2-9)-6\sqrt{x_2-9}+9=\left(\sqrt{x_2-9}-3\right)^2$

$x_3-10\sqrt{x_3-25}=x_3-25-10\sqrt{x_3-25}+25=\left(\sqrt{x_3-25}-5\right)^2$

Similarly $x_3-14\sqrt{x_4-49}=\left(\sqrt{x_4-49}-7\right)^2$

$\therefore$ given expression is $\left(\sqrt{x_1-1}-1\right)^2+\left(\sqrt{x_2-9}-3\right)^2+\left(\sqrt{x_4-25}-5\right)^2+\left(\sqrt{x_4-49}-7\right)^2=0$

When $a^2+b^2+c^2+d^2=0 \Rightarrow a=0; b=0; c=0$ and $d=0$

$\therefore \sqrt{x_1-1}-1=0\Rightarrow\sqrt{x_1-1}=1;\ x_1-1=1\Rightarrow x_1=2$

$\sqrt{x_2-9}-3=0\Rightarrow x_2-9=9\Rightarrow x_2=18$

$\sqrt{x_3-25}-5=0\Rightarrow x_3-25=25\Rightarrow x_3=50$

$\sqrt{x_4-4a}-7=0\Rightarrow x_4-49=49\Rightarrow x_4=98$

$\therefore x_1-x_2-x_3+x_4=2-18-50+98=100-68=32$

63. Value of $\left(1+\frac{1}{11}\right)\left(1+\frac{1}{12}\right)\left(1+\frac{1}{13}\right).....\left(1+\frac{1}{21}\right)$ is

1) 1 2) 2 3) $\frac{1}{11}$ 4) $\frac{11}{21}$

Ans. 2 $\left(1+\frac{1}{11}\right)\left(1+\frac{1}{12}\right)\left(1+\frac{1}{13}\right).....\left(1+\frac{1}{21}\right)=\frac{12}{11}\times\frac{13}{12}\times\frac{14}{13}\times.....\frac{21}{20}\times\frac{22}{21}=\frac{1}{11}\times\frac{22}{1}=2$

64. If $x=\frac{3}{2}$, then the value of $x+\frac{1}{x}$ is

1) $\frac{13}{6}$ 2) $\frac{6}{13}$ 3) $\frac{7}{13}$ 4) $\frac{13}{7}$

Ans. 1

$x=\frac{3}{2};\frac{1}{x}=\frac{2}{3};\therefore x+\frac{1}{x}=\frac{3}{2}+\frac{2}{3}=\frac{9+4}{6}=\frac{13}{6}$

65. If $x^2=xy+26$ and $y^2=xy-10$, then

1) $y=x$ 2) $y=x+4$ 3) $x+y=4$ 4) $y=x-4$

Ans. 2 or 4

$x^2-xy=26.....(1)$

$xy-y^2=10.....(2)$

$(1)-(2)\Rightarrow\left(x^2-xy\right)-\left(xy-y^2\right)=26-10$

$x^2-xy-xy+y^2=16$

$x^2-2xy+y^2=16$

$(x-y)^2=16;x-y=4\Rightarrow x=y+4$ or $y=x-4$

SECTION -B (MATHEMATICS)

66. If sum of roots of $x^2-18x+11=0$ is

Ans. 18 Sum of roots = 18

67. If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the 20th term.

Ans. 200

$$S_{14} = 1050 \Rightarrow 1050 = \frac{14}{2}\left[2\times 10 + (14-1)d\right]$$
$$1050 = 7(20 + 13d)$$
$$1050 = 140 + 91d$$
$$910 = 91d \Rightarrow d = 10$$
$$t_{20} = a + 19d = 10 + 190 = 200$$

68. Term independent of x in the expansion of $\left(3x + \frac{1}{2x}\right)^2$ is

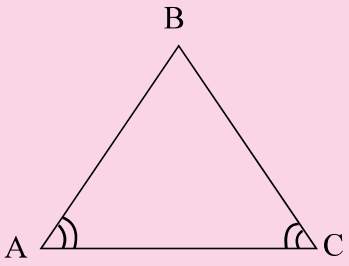
Ans. 3

$$\left(3x + \frac{1}{2x}\right)^2 = 9x^2 + 2\times 3x \times \frac{1}{2x} + \frac{1}{4x^2} = 9x^2 + 3 + \frac{1}{4x^2}$$

$\therefore$ constant term is 3

69. In ΔABC, $\angle C = \angle A$ and BC = 4cm and AC = 5cm, then the length of AB, is

Ans. 4 Given $\angle A = \angle C; \therefore AB = BC;\ BC = 4 \Rightarrow AB = 4$



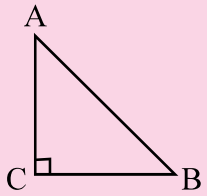
70. In ΔABC, $\angle C = 90°$, then $\sin^2 A + \sin^2 B$ is

Ans. 1

$$\sin A = \frac{BC}{AB}$$

$$\sin B = \frac{AC}{AB}$$

$$\therefore \sin^2 A + \sin^2 B = \frac{BC^2}{AB^2} + \frac{AC^2}{AB^2} = \frac{BC^2 + AC^2}{AB^2} = \frac{AB^2}{AB^2} = 1$$



71. $P(x) = 2x^3 + 3x^2 - 8x - 3$ and

$Q(x) = 3x^3 + 2x^2 + 9x + 1$, then the degree of $3P(x) - 2Q(x)$ is

Ans. 2

$$P(x) = 2x^3 + 3x^2 - 8x - 3$$

$$Q(x) = 3x^2 + 2x^2 + 9x + 1$$

$$3P(x) = 6x^3 + 9x^2 - 24x - 9$$

$$2Q(x) = 6x^3 + 4x^2 + 18x + 2$$

$$3P(x) - 2Q(x) = 5x^2 - 42x - 11$$

$\therefore$ degree of $3P(x) - 2Q(x)$ is 2

72. If a and b are different natural numbers such that $a^b = b^a$, then a + b is

Ans. 6

$a^b = b^a$ and $a \neq b$ is possible only

for $a = 2$ and $b = 4$; $\therefore a + b = 6$

73. $(x + a)^2 = x^2 + bx + b$, and $a > 0$, then $(a + b)^2$ is

Ans. 36

$$(x+a)^2 = x^2 + bx + 6$$
$$\Rightarrow x^2 + 2ax + a^2 = x^2 + bx + b$$
$$\Rightarrow 2a = b \text{ and } a^2 = b$$
$$\therefore 2a = a^2 \Rightarrow a = 2 \text{ since } a > 0$$
$$\therefore b = 2^2 = 4; \therefore (a+b)^2 = (2+4)^2 = 36$$

74. Arithmetic mean of 17, 20, 23, 40 and x is 30, then the value of x is

Ans. 50 $\dfrac{17+20+23+40+x}{5} = 30; 100 + x = 150; x = 50$

75. If $(a + b)^2 + (a – b)^2 = p(a^2 + b^2)$ and $(a + b)^2 – (a – b)^2 = qab$, then the value of pq is

Ans. 8

$(a + b)^2 = a^2 + 2ab + b^2$

$(a – b)^2 = a^2 – 2ab + b^2$

Therfore $(a + b)^2 + (a – b)^2 = 2a^2 + 2b^2 = 2(a^2 + b^2) \Rightarrow p = 2$

$(a + b)^2 – (a – b)^2 = 4ab \Rightarrow q = 4$; Therefore $pq = 8$

IIT/AIIMS SCREENING TEST - 27-12-2025

QUESTION BOOKLET CODE

A

P + C + M : - Key with Hints

1	1	26	4	51	4
2	2	27	3	52	3
3	3	28	4	53	1
4	4	29	1	54	1
5	2	30	4	55	4
6	3	31	3	56	1
7	3	32	4	57	2
8	1	33	2	58	4
9	2	34	4	59	3
10	3	35	1	60	3
11	4	36	2	61	4
12	4	37	1	62	2
13	1	38	4	63	2
14	1	39	3	64	1
15	2	40	3	65	2 or 4
16	16	41	3	66	18
17	22	42	28	67	200
18	1	43	15	68	3
19	200	44	8	69	4
20	15	45	3	70	1
21	5	46	4	71	2
22	75	47	5	72	6
23	200	48	11	73	36
24	0	49	172	74	50
25	20	50	5	75	8

IIT/AIIMS SCREENING TEST - 27-12-2025

QUESTION BOOKLET CODE **B**

P + C + M : - Key with Hints

1	2	26	4	51	1
2	3	27	4	52	4
3	3	28	3	53	2
4	1	29	2	54	4
5	4	30	4	55	3
6	1	31	3	56	1
7	2	32	3	57	2 or 4
8	1	33	4	58	1
9	3	34	3	59	3
10	3	35	3	60	1
11	4	36	4	61	4
12	2	37	1	62	4
13	3	38	1	63	2
14	4	39	2	64	4
15	1	40	1	65	2
16	200	41	8	66	4
17	15	42	3	67	1
18	200	43	11	68	36
19	0	44	172	69	50
20	20	45	5	70	8
21	16	46	3	71	18
22	22	47	28	72	200
23	1	48	15	73	3
24	5	49	4	74	2
25	75	50	5	75	6

IIT/AIIMS SCREENING TEST - 27-12-2025

QUESTION BOOKLET CODE **C**

P + C + M : - Key with Hints

1	2	26	4	51	4
2	3	27	1	52	2
3	4	28	2	53	1
4	4	29	1	54	3
5	1	30	3	55	4
6	2	31	4	56	3
7	3	32	3	57	1
8	4	33	1	58	4
9	1	34	4	59	2
10	1	35	3	60	2
11	2	36	3	61	2 or 4
12	3	37	1	62	4
13	2	38	3	63	4
14	3	39	3	64	2
15	2	40	3	65	4
16	5	41	4	66	2
17	75	42	5	67	6
18	16	43	3	68	18
19	22	44	28	69	200
20	1	45	15	70	3
21	200	46	11	71	36
22	0	47	172	72	50
23	20	48	5	73	8
24	200	49	8	74	4
25	15	50	3	75	1

IIT/AIIMS SCREENING TEST - 27-12-2025

QUESTION BOOKLET CODE **D**

P + C + M : - Key with Hints

1	1	26	1	51	2
2	1	27	3	52	2
3	2	28	3	53	2 or 4
4	3	29	4	54	4
5	4	30	1	55	3
6	3	31	3	56	4
7	4	32	1	57	2
8	2	33	4	58	1
9	2	34	4	59	4
10	3	35	3	60	2
11	1	36	2	61	1
12	2	37	3	62	4
13	2	38	3	63	3
14	3	39	4	64	1
15	4	40	4	65	1
16	200	41	11	66	36
17	0	42	172	67	50
18	20	43	5	68	8
19	5	44	4	69	2
20	75	45	5	70	6
21	200	46	8	71	4
22	15	47	3	72	1
23	16	48	3	73	18
24	22	49	28	74	200
25	1	50	15	75	3