A

SCSS-ST-SB-22
PCM

Question Booklet Sr. No.

220042

Date : 10/04/2022 Time : **2.30 Hrs.** **Marks** : Section-A = 30 + Section-B = 240 = 270

Important Instructions :

1. Immediately fill the particulars on this page of the Test Booklet as well as Answersheet with Black or Blue Ball Pen. ***Use of pencil is strictly prohibited.***
2. Do not open this Test Booklet until you are asked to do so.
3. This Test Booklet contains of **90** questions.
4. There are two sections in the question paper i.e. **Section–A** and **Section–B**.
5. The **Section–A** contains three parts i.e. Part-I, Part–II and Part-III.
6. The **Part-I** contains **10** questions of **English.**
7. The **Part-II** contains **10** questions of **Mental Ability.**
8. The **Part-III** contains **10** questions of **Basic Mathematics.**
9. In **Section–A**, each question carries **ONE** mark. There is no negative marking system.
10. The **Section–B** contains **THREE** parts i.e. Part–I, Part–II and Part-III.
11. The **Part-I** contains **20** questions of **Physics.**
12. The **Part-II** contains **20** questions of **Chemistry.**
13. The **Part-III** contains **20** questions of **Mathematics.**
14. In the **Section–B**, each question carries **4** marks. There is negative marking system. For each wrong answer **1** mark will be deducted.
15. There are four choices for every question, out of which only one choice is most correct.
16. Filling up more than one responses in any question will be treated as wrong response and marks for this will be deducted according to negative system.
17. No candidates is allowed to carry any printed or written textual material, bits of papers, cell phone and any other electronic devices.
18. Rough work is to be done on the space provided in the Test Booklet only.
19. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty. ***However, candidates are allowed to take away this Question Paper with them.***
20. **Do not fold or make any stray marks on the Answer Sheet.**

Name of the Candidate (in Capital letters) : _____

Seat No : In figures | | | | | | | |

Section - A : (Part–I – English)

Instruction :

1. Select the most suitable alternative which conveys the exact meaning in accordance with the correct grammatical rules.
   1) My sister had left for America last week.
   2) My sister has been left for America last week.
   3) My sister has left for America last week.
   4) My sister left for America last week.

Instruction : Idenitfy the part that contains an error.

2. Neither (A)/ the old man nor his (B) / children knows (C) / what to do about the (D) / problem.
   1) A
   2) B
   3) C
   4) D

Instruction : Choose the one which best replaces the underlined words.

3. One of the function of a teacher is to spot cases of maladjustment.
   1) Most of the function of
   2) One of the functions of
   3) One of the functions by
   4) NO change

Instruction : Find the word that conveys the same meaning.

4. DOMAIN.
   1) area
   2) main
   3) marketing
   4) wild

Instruction : Select the word that is opposite in meaning.

5. CONVEX.
   1) concave
   2) U–shape
   3) bent
   4) arched

Instruction : Select the pair of words to replace the question mark.

6. Kindness : Mercy : : Cruelty : ? .
   1) Savageness
   2) Wildness
   3) Death
   4) Destruction

Instruction : Choose the one that can be substituted for the given phrase.

7. Teetotaler means.
   1) one who abstains from theft
   2) one who abstains from meat
   3) one who abstains from taking wine
   4) one who abstains from taking malice

Instruction : Find out the correct meaning of the Idiomatic expression :

8. To be at the zenith of.
   1) to die an immature death
   2) to be succumbed to one's flattery
   3) to be at the peak of
   4) face difficulty boldly

Instruction :

9. Choose the correctly spelt word :
   1) accomodate
   2) acommodate
   3) accommodate
   4) acomodate

Instruction : Choose the correct alternative out of the four choices to complete the sentence.

10. If I _____ you, I would have told him the truth.
    1) am
    2) were
    3) was
    4) and

(Part–II – Mental Ability)

11. Find the missing term in following number series.

1, 4, 27, 16, ? , 36, 343

1) 25 2) 87

3) 120 4) 125

12. Which term comes next in the series : YEB, WFD,UHG, SKI, ?

1) QOL 2) QGL

3) TOL 4) QNL

13. Anaemia : Blood : : Anarchy : ?

1) Lawlessness 2) Government

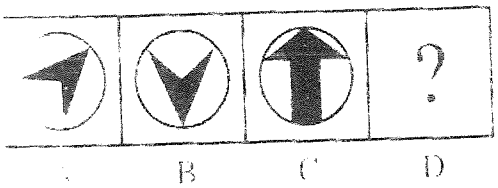
3) Monarchy 4) Disorder

14. In a certain code language, RUSTICATE is written as QTTUIDBSD. How would STATISTIC be written in that code ?

1) RSBUJTUHB 2) RSBUITUHB

3) RSBUIRSJD 4) TUBUITUMB

15. Figures A and B are related in a particular manner. Establish the same relationship between figures C and D by choosing a figure from amongst the four alternatives, which would replace the question mark in fig. (D).



1)  2) 

3)  4) 

16. Deepa moved a distance of 75 metres towards the north. She then turned to the left and walking for about 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of 45°. In which direction was she moving finally ?

1) North-east 2) North-west

3) South 4) South-west

Space For Rough Work

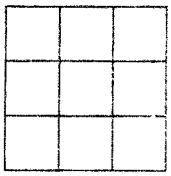
17. Pointing out to a lady, Rajan said, "She is the daughter of the woman who is the mother of the husband of my mother." Who is the lady to Rajan ?

1) Aunt
2) Grand daughter
3) Daughter
4) Sister-in-law

18. If × stands for −, ÷ stands for +, + stands for ÷ and − stands for ×, which one of the following equations is correct ?

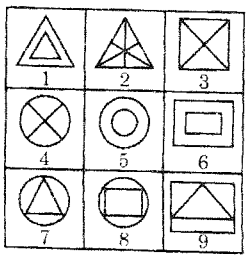
1) $15 - 5 \div 5 \times 20 + 10 = 6$
2) $8 \div 10 - 3 + 5 \times 6 = 8$
3) $6 \times 2 + 3 \div 12 - 3 = 15$
4) $3 \div 7 - 5 \times 10 + 3 = 10$

19. Count the number of squares in the following figure.



1) 18
2) 14
3) 10
4) 9

20. In following question group the given figures into three classes using each figure only once.



1) 1, 2, 3 ; 4, 5, 8 ; 6, 7, 9
2) 1, 5, 6 ; 2, 3, 4 ; 7, 8, 9
3) 1, 3, 5 ; 2, 4, 8 ; 6, 7, 9
4) 1, 4, 7 ; 2, 5, 8 ; 3, 6, 9

Space For Rough Work

(Part–III – Basic Mathematics)

21. Two pipes A and B can fill a tank in 16 hours and 20 hours respectivelly. If the both pipes are opened simultaneously then how much time will it take to fill the tank?

1) $8\frac{8}{5}$ hrs
2) $8\frac{8}{9}$ hrs
3) $8\frac{17}{9}$ hrs
4) $8\frac{17}{9}$ hrs

22. If the length of the diagonals of rhombus are 30 cm and 16 cm respectively. Then perimeter of rhombus is

1) 17 cm
2) 69 cm
3) 68 cm
4) 63 cm

23. If $\tan\theta = \frac{p}{q}$ and $q^2 = 1 + p^2$ then value of $\frac{\sin\theta + \cos\theta}{\cos\theta - \sin\theta}$ is

1) $(p-q)^2$
2) $(q-p)^3$
3) $\frac{p^2+q^2}{p^2-q^2}$
4) $(p+q)^2$

24. If the values of $a = \sqrt{3}, b = \sqrt{5}, c = \sqrt{7}$ then values of $(a-b)^3 + (b-c)^3 + (c-a)^3$ is

1) 3 (a–b) (b–c) (c–a)
2) 3 (a+b) (b+c) (c+a)
3) 3 abc
4) none of these

25. The segment AB is trisected by the points P and Q then length of PQ is where A $\equiv (5, -6)$ and B $\equiv (-7, -1)$

1) 13
2) $\frac{13}{5}$
3) $\frac{13}{3}$
4) None of these

Space For Rough Work

26. The value of $\log_2 8 + \log_4 8 + \log_{16} 8$ is

1) $\frac{21}{4}$ 2) 5

3) 6 4) 4

27. If the sides of a cube is increased by 50% then percentage of increase in surface area is

1) 50% 2) 75%

3) 100% 4) 125%

28. Three cubes of metal with edges 3 cm, 4 cm & 5 cm respectivelly are melted to form a single cube. Then the lateral surface area of new cube formed is

1) 267 cm^2 2) 284 cm^3

3) 224 cm^2 4) 144 cm^2

29. If $x + y = 10$ and $x^2 + y^2 = 58$ then value of $x^3 + y^3$ is

1) 625 2) 628

3) 790 4) None of these

30. If $7\sin^2\theta + 3\cos^2\theta = 4$ then value of $\tan\theta$ is

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

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

Space For Rough Work

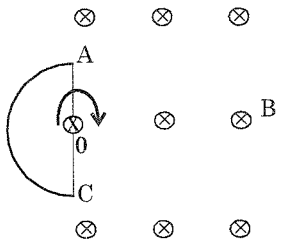
Section - B : (Part –I – Physics)

31. The apparent bending of a straw placed in a glass of water is due to
    1) reflection of light
    2) refraction of light
    3) rectilinear propagation of light
    4) curve nature of light

32. Out of the following which has a virtual focus
    1) convex lens
    2) plane mirror
    3) concave lens
    4) concave mirror

33. Erect image by convex lens is always
    1) same size
    2) magnified
    3) diminished
    4) very small size

34. In a region, a uniform magnetic field B is directed perpendicular and inward as shown. A semi circular closed metallic ring 'AC' is rotating about 'O'



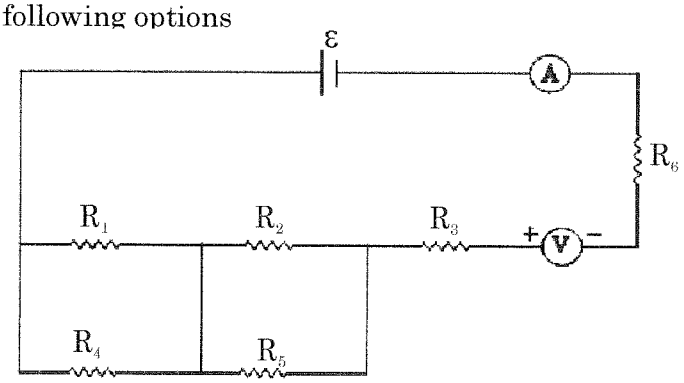
    1) there will be no induced emf in the ring
    2) there will be no induced current in the ring
    3) there will be induced current in the ring
    4) there will be magnetic field only

35. A cylindrical bar magnet is kept along the axis of a circular coil. If the magnet is rotated about its axis' then
    1) A current will be induced in a coil
    2) No current will be induced in a coil
    3) Only an emf will be induced in a coil
    4) An emf and a current both will be induced in a coil

Space For Rough Work

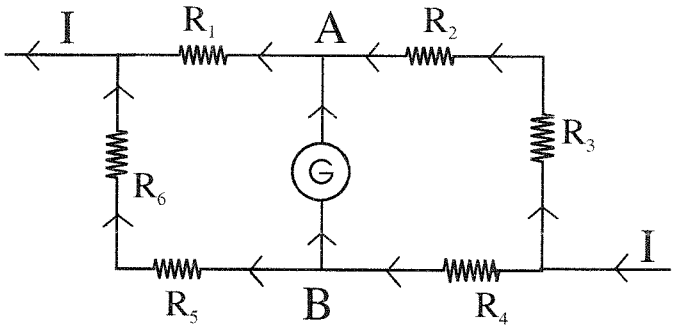
36. A coil of metal wire is kept stationary in a uniform magnetic field, then
    1) an emf is induced in the coil
    2) a current is induced in the coil
    3) neither emf nor current is induced
    4) both emf and current are induced

37. In the given ciruit, the ammeter and the voltmeter are ideal. The reading of ammeter is almost zero, and voltmeter is not showing any reading, to have a finite current I, how do you proceed with the following options



    1) Ammeter must be connected in parallel
    2) Ammeter and voltmeter are to be interchanged
    3) Voltmeter is not working
    4) Voltmeter must be connected in parallel across any resistor

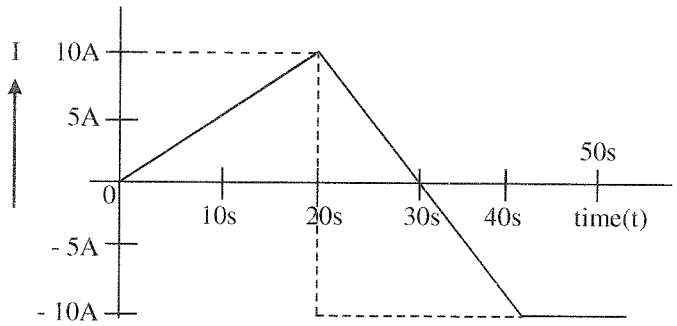
38. The galvanometer (G) in the circuit is a sensitive device and cannot sustain with a high current, to protect it, a high resistance (HR) is provided to you, choose the correct option



    1) HR is not needed
    2) HR must be connected in between A and G
    3) HR must be connected in between G and B
    4) HR can be connected anywhere in the branch AB

Space For Rough Work

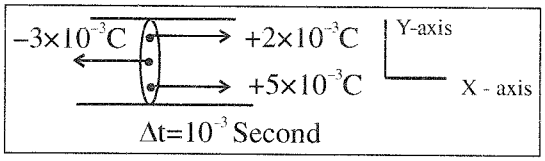
39. The current strength (I) in ampere on Y-axis and time (t) in second on X-axis plotted as shown in the figure. Analyse and choose the correct option of the following



1) In the interval 0s to 20s current has same direction and magnitude
2) The direction of the current is reversed just after 20 second
3) The strength of the current is increasing from 30 second to 40 second, but in opposite direction to that of initial direction during 0 s to 30 s
4) The directions of the current between 25 second to 30 second and 15 second to 20 second are opposite

40. In a liquid across a cross-section, the flow of charge (including positive and negative ions) within a time interval of one milli second is as shown, the current strength can be

1) 4×10^{-A} along +ve x-axis
2) 10 A along +ve x-axis
3) 10^{-2} A along +ve x-axis
4) 0.4 A along –ve x–axis



41. For a particle at rest, which of the following quantity does not change any where

1) mass
2) weight
3) gravitational force
4) acceleration due to gravity

42. Two objects of mass 2 kg and 8 kg separated by a distance of 4m. Find the gravitational force between the two bodies

1) $4 \times 6.67 \times 10^{-11}$ N
2) $4 \times 6.67 \times 10^{-8}$ N
3) 6.67×10^{-8} N
4) 6.67×10^{-11} N

43. Find the increase in K.E. of a body of mass 200 g, when its speed increases from 4 m/s to 5 m/s ?

1) 0.9 J
2) 9 J
3) 900 J
4) 90 J

Space For Rough Work

44. The kinematical equations of the motion can be applicable only when the particle has,
1) displacement constant 2) vairable acceleration
3) acceleration constant 4) non uniform acceleration

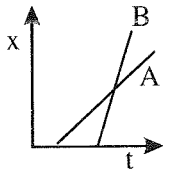
45. Prapti has applied a force of 50 N on an object, at an angle of 30° to the vertical. The object gets displaced in the horizontal direction and 300 J work is done. What is the displacement of the object ?
1) 12 m 2) $\frac{12}{\sqrt{3}}$ m
3) $\frac{12}{\sqrt{2}}$ m 4) 6 m

46. A force is needed to
i) change state of rest ii) change state of motion iii) change direction of motion
Choose the correct option
1) (i) only 2) (i) and (ii) only
3) (i)(ii) and (iii) 4) (iii) only

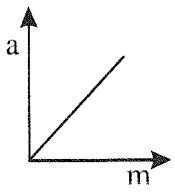
47. Motion of the particle along the circumference of the circle is known as uniform circular motion, if its -------- remains constant
1) speed 2) velocity
3) accelertion 4) displacement

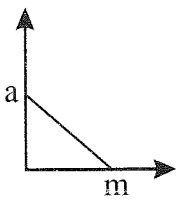
48. Motion of the particle is known as non-uniform motion, if its
I) speed constant II) velocity constant
III) acceleration constant IV) acceleration variable
which of the following option is correct.
1) only I 2) only II
3) only III 4) III or IV

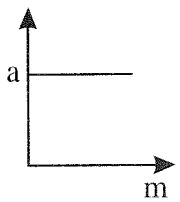
49. Figure shows distance time graphs of two objects A & B. Which object is moving with a greater speed when both are moving ?
1) A is faster than B
2) B is faster than A
3) Both A & B have same speed
4) B is stationary

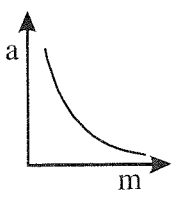


50. If a constant force is applied on bodies of different masses, corresponding acceleration – mass graph is

1) 

2) 

3) 

4) 

Part II – Chemistry

51. The water which is fit for drinking is called
1) black water 2) hot water
3) potable water 4) sewage water

52. The mass of an electron is about $\frac{1}{X}$ times the mass of hydrogen atom. The value of X is
1) 2 2) 200
3) 2000 4) 20000

53. What will be the percentage loss in mass when $NaHCO_3$ is heated at 30°C? (approximate) Molecular mass of $NaHCO_3$ = 84, Na_2CO_3 = 106
1) 60% 2) 45%
3) 37% 4) 70%

54. Which of the following pair of oxides are amphoteric ?
1) SO_3, CO_2 2) Al_2O_3, ZnO
3) Na_2O, MgO 4) Al_2O_3, CO_2

55. Which of the following molecule has maximum type of bonds ?
1) $CuSO_4.5H_2O$ 2) $NaClO_4$
3) HF 4) NH_3

56. Iron is harder than sodium because
1) iron atoms are smaller
2) iron atoms are more closely packed
3) metallic bonds are stronger in sodium
4) metallic bonds are stronger in iron

57. At 25°C & 760 mm of Hg pressure a gas occupies 600 ml volume. What will be its pressure at a height where temperature is 10°C and volume of the gas is 640 ml ?
1) 338.3 mm Hg 2) 1353.2 mm Hg
3) 676.6 mm Hg 4) 1014.9 mm Hg

58. Which of the following contains highest number of oxygen atoms.
1) 1g of Oxygen atom 2) 1g of O_2
3) 1g of O_3 4) 2g of H_2O

59. The acid used for washing eye is
1) boric acid 2) acetic acid
3) hydrochloric acid 4) oxalic acid

60. Which of the following has lowest melting point ?
1) Acetic acid (CH_3COOH) 2) Chloroform ($CHCl_3$)
3) Ethanol (CH_3CH_2OH) 4) Methane (CH_4)

61. In NaCl ionic solid, each Na^+ ion is surrounded by how many Cl^- ions?
1) 6 2) 8
3) 4 4) 2

62. Among (a) Na_2O (b) MgO (c) Al_2O_3 (d) P_2O_5 (e) Cl_2O_7 the most basic, most acidic and amphoteric oxide can be
1) a, b, c 2) b, e, c
3) a, e, c 4) e, c, a

63. Lead nitrate on decomposition releases brown colour fumes. The chemical formula of brown colour fumes is

1) NO_2 2) NO

3) N_2O 4) N_2O_5

64. When Bauxite is heated with NaOH solution. The water soluble compound formed is

1) $NaAlO_2$ 2) Na_3AlO_3

3) $Al(OH)_3$ 4) Al_2O_3

65. A student takes about 2 ml ethanoic acid in a dry test tube and adds a pinch of sodium carbonate to it. What will observe?

1) A colourless and odourless gas evolves with brisk effervescence.
2) A colourless and odourless gas evolves which burns with pop sound when a burning candle is brought near it.
3) A brown coloured gas with foul smell evolves with a brisk effervescence.
4) A brown coloured gas with foul smell evolves which burns with pop sound when a burning candle is brought near it.

66. The property of direct bonding between atoms of the same element to form a chain is called

1) isomerism 2) polymerization

3) dehydration 4) catenation

67. Members of a homologous series have similar

1) chemical properties 2) physical properties

3) molecular weight 4) general molecular formula

68. Match the following :

A)	Cooking gas	i)	$C_{12}H_{22}O_{11}$
B)	Sugar	ii)	$C_{10}H_{16}O$
C)	Camphor	iii)	C_6H_6
D)	Benzene	iv)	$C_3H_8 + C_4H_{10}$

1) A – iv, B – ii, C – iii, D – i 2) A – iii, B – ii, C – i, D – iv

3) A – iv, B – i, C – ii, D – iii 4) A – ii, B – iii, C – iv, D – i

69. Higher homologue of methyl alcohol on complete oxidation gives

1) CO_2 and H_2O 2) CH_3CHO

3) HCOOH 4) CH_3COOH

70. $CH_4 + Cl_2 \xrightarrow{\text{Sunlight}} CH_3\text{–}Cl + H\text{–}Cl$ is an example of

1) addition reaction 2) substitution reaction

3) combustion reaction 4) reduction reaction

Space For Rough Work

Part III – Mathematics

71. The coordinates of the third vertex of an equilateral triangle, whose two vertices are at (3, 4), (– 2, 3) is

1) (1, 7)
2) $\left(\frac{1-\sqrt{3}}{2}, \frac{7+5\sqrt{3}}{2}\right)$
3) $\left(\frac{1-\sqrt{3}}{2}, \frac{7-5\sqrt{3}}{2}\right)$
4) $\left(\frac{1+\sqrt{3}}{2}, \frac{7+5\sqrt{3}}{2}\right)$

72. If the angle of elevation of a cloud from a point h metres above a lake is x and the angle of depression of its reflection in the lake is y. Then the distance of the cloud from the point of observation is

1) $\frac{2h\sec x}{\tan y+\tan x}$
2) $\frac{2h\cos x}{\tan x+\tan y}$
3) $\frac{2h\cot x}{\tan y+\tan x}$
4) $\frac{2h\sec x}{\tan y-\tan x}$

73. A toy is in the form of a cone mounted on a hemisphere with the same radius. The diameter of the base of the conical portion is 12 cm and its height is 8 cm. Then surface area of toy is ($\pi = 3.14$)

1) 414.48 cm^2
2) 413.48 cm^2
3) 413.68 cm^2
4) 412.68 cm^2

74. The inner circumference of a circular track is 24π metre. The track is 2 metre wide from everywhere. The quantity of wire required to surround path completely is

1) 80 m
2) 81 m
3) 82 m
4) 88 m

75. The mean of 9 observations is 36. If the mean of the first '5' observations is 32 and that of the last 5 observations is 39, then the fifth observation is

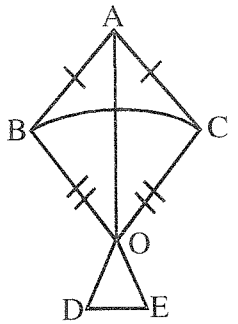
1) 28
2) 31
3) 43
4) 37

76. A and B together can do a piece of work in 15 days. If one day's work of A be $1\frac{1}{2}$ times, one day's work of B. Find how many day's will each take to finish the work alone?

1) 25; 37
2) 25.5; 37
3) 26; 37.5
4) 25; 37.5

Space For Rough Work

77. A kite is made as shown alongside in which ABC is an equilateral triangle with side 20 cm, BOC is an isosceles triangle with OB = OC = 26 cm and ODE is an isosceles triangle with the base DE = 8 cm and height 6 cm. Find area of kite



1) 436.2 sq. cm
2) 437.2 sq. cm
3) 439.2 sq. cm
4) 435.2 sq. cm

78. The sum of the interior angles of a polygon is five times the sum of its exterior angles. Find the number of sides in the polygon

1) 8
2) 10
3) 12
4) 6

79. If $a^2 + \frac{1}{a^2} = 23$ and $a \neq 0$ then $a^3 + \frac{1}{a^3} =$

1) 100
2) 46
3) 110
4) 529

80. What sum of money will amount to Rs. 9,261 in 3 years at 5% per annum compound interest?

1) 6,000
2) 7,000
3) 8,000
4) 9,000

81. Srikanth and Satish running around a circular path. Srikanth takes 24 minutes and Satish takes 18 minutes to complete one round of the path. If both of them starts at the same point, then find after how many minutes they will meet again at the same starting point.

1) 64 minutes
2) 332 minutes
3) 72 minutes
4) 80 minutes

82. Find the remaining two zeros of the polynomial $f(y) = 3y^4 + 6y^3 - 2y^2 - 10y - 5$. If the two zeros of polynomial is $\pm\sqrt{\frac{5}{3}}$

1) (– 4, 2)
2) (– 1, – 1)
3) (–3, 1)
4) (– 1, 3)

Space For Rough Work

83. If the roots of the equation $(a-b)x^2 + (b-c)x + (c-a) = 0$ are equal then
1) $2b = a + c$ 2) $2a = b + c$
3) $2c = a + b$ 4) $\frac{1}{b} = \frac{1}{a} + \frac{1}{c}$

84. A man walks a distance of 48 Km in a given time. If he walks 2 Km/hr faster, he will perform the journey 4 hrs before. His normal rate of walking is
1) 3 Km/hr 2) 4 Km/hr
3) – 6 Km/hr 4) 5 Km/hr

85. There are 25 trees at equal distances of 5 meters in a line with a well. The distance of the well from the nearest tree being 10 metres. A gardener waters all the trees separately starting from the well and he returns to the well after watering each tree to get water for the next. Find the total distance, the gardener will cover in order to water all the trees
1) 3000 m 2) 3500 m
3) 3800 m 4) 4000 m

86. If a tree casts a 18 feet shadow and at the same time, a child of height 3 feet casts a 2 feet shadow, then the height of the tree is
1) 32 feet 2) 45 feet
3) 36 feet 4) 27 feet

87. If $x = \frac{\sqrt{3a+2b} + \sqrt{3a-2b}}{\sqrt{3a+2b} - \sqrt{3a-2b}}$. Then $bx^2 + b =$
1) $3x$ 2) $3ax$
3) $3b^2$ 4) $3bx$

88. If $\sin^2\theta_1 + \sin^2\theta_2 + \sin^2\theta_3 = 0$.

Then which of the following is not possible value of $\cos\theta_1 + \cos\theta_2 + \cos\theta_3$?
1) 3 2) – 3
3) – 1 4) – 2

89. If $\tan A + \sin A = m$ and $\tan A - \sin A = n$ then $m^2 - n^2 =$
1) $4\sqrt{m}$ 2) $4\sqrt{n}$
3) $4\sqrt{mn}$ 4) 4 mn

90. A bag contains 12 balls of two different colours, out of which X are white. One ball is drawn at random. If 6 more white balls are put in the bag, the probability of drawing a white ball now will be double to that of the previous probability of drawing a white ball. Then, the value of X is
1) 3 2) 4
3) 5 4) 6

Space For Rough Work

IMPORTANT DATES

ONLY For 10th Maharashtra State Board Students

(Except CBSE, ICSE And Other Board Students)

Screening Test 2022 : **Pen Paper Based** **(OFF LINE MODE EXAM ONLY)**	Please Refer Website : www.junior-shahucollegelatur.org.in
Registration for Screening Test - 2022	22 Feb. 2022 to 14 Mar. 2022
Last date for fee payment of registered Candidates	15 Mar. 2022 (13:00 IST)
Admit Card available for downloading (Login your Account)	06 Apr. 2022 (17:00 IST)
SCREENING TEST - 2022 (OFFLINE MODE ONLY)	**10 April 2022**
Copy of candidate responses to be available on the website	14 Apr. 2022 (13:00 IST)
Online display of provisional answer keys	14 Apr. 2022 (13:00 IST)
Feedback and comments on provisional answer keys from the candidates	14 Apr. 2022 (13:00 IST) 15 Apr. 2022 (13:00 IST)
Online declaration of final answer keys	16 Apr. 2022 (11:00 IST)
Result of SCREENING TEST 2022	16 Apr. 2022 (15:00 IST) (On Candidate Indivisual Login)
Parent's Meet (PCM GROUP)	17 Apr. 2022 (11:00 IST) (For Selected and Wait List Candidate)
Parent's Meet (PCB GROUP)	17 Apr. 2022 (14:00 IST) (For Selected and Wait List Candidate)
Admissions : First List	18 Apr. 2022 (11:00 IST) 21 Apr. 2022 (17:00 IST)

Space For Rough Work