B

SCSS-ST–23
PCM

Question Booklet Sr. No.
212875

Date : 02/04/2023 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 **Basic Mathematics.**
8. The *Part-III* contains **10** questions of **Mental Ability.**
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 **Mathematics.**
12. The *Part-II* contains **20** questions of **Physics.**
13. The *Part-III* contains **20** questions of **Chemistry.**
14. In the **Section–B**, each question carries **4** marks. There is **negative** marking system. For each wrong answer **1 mark will be deducted from obtained marks.**
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 | | | | | | | |

Space For Rough Work

Section - A : (Part–I – English)

Instruction :

01. Choose the one that can be substituted for the given phrase :
One who sacrifies his life for a specific cause
1) soldier 2) revolutionary
3) patriot 4) martyr

Instruction :

02. Find the word that conveys the same meaning.
HALLOWED
1) favourite 2) precious
3) sacred 4) respected

Instruction :

03. Select the word that is opposite in meaning.
DISPLAY
1) demonstrate 2) conceal
3) exhibit 4) show

Instruction :

04. Select the pair of words to replace the qustion mark.
Carbohydrates : Obesity : : ? : ?
1) Pressure : Extrusion 2) Hostility : War
3) Avesion : Regression 4) Sugar : Cavities

Instruction :

05. Select from the answer choices given under the sentence to form grammatically correct sentence :
Such people **never have and never will be trusted** .
1) never have and will be trusted
2) never have been trusted and never will be trusted
3) never have had anyone trust them and never will have anyone
4) never have and never will be trust

Instruction :

06. Find out the correct meaning of the Idiomatic expression :
Under a cloud
1) under suspicion 2) under observation
3) experiencing cloudy weather 4) enjoying favourable luck

Instruction :

07. Choose the word that best completes the sentence.
In last year's economic survey, the weakness _____ to availability and quality of services data were highlighted.
1) related 2) approximate
3) beside 4) nearly

Instruction :

08. Select the most appropriate word to fill in the blank.
He has the full facts ..... but is deliberately hiding them.
1) under his sleeves 2) upon his sleeves
3) up his sleeves 4) in his sleeves

Instruction :

09. Identify the part that contains an error.
Candidates must/have excess/to good/reference books.
1) 3 2) 4
3) 1 4) 2

10. I look ..... him as an authority on Indian Economics.
1) for 2) of
3) at 4) on

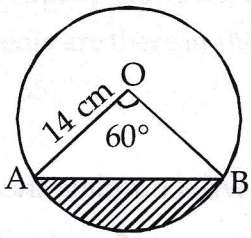
Part–II – Basic Mathematics

11. The population of the city is 6000 and $\frac{1}{4}$th of the population is male and rest of them are female. If the 30 % of the male are married, then the percentage of married female in the city is
1) 25 % 2) 35 %
3) 10 % 4) 15 %

12. $(x + y)^3 - 3(x + y)xy - 3(x - y)\,xy - (x - y)^3 = q$ then q is
1) $6x^2y$ 2) $6xy^2$
3) $2y^3$ 4) $8x^3$

13. The base radii of a cone and a cylinder are equal. If their curved surface areas are also equal, then the ratio of the slant height of the cone to the height of the cylinder is
1) 1 : 1 2) 2 : 1
3) 1 : 3 4) 3 : 1

14. The area of shaded region is



1) 17.89 2) 18.50
3) 16.21 4) 17.05

15. If $\log_b n = 2$ and $\log_n 2b = 2$ then the value of b^3 is

1) 3 2) 2
3) 4 4) 6

16. The remainder obtained on dividing $x^3 + 3x^2 - 5x + 4$ by $(x - 1)$ is

1) –1 2) 1
3) 2 4) 3

17. Robert can finish the writing of the book in 8 days while James can finish the same work in 10 days. If they work together then how long they will take to finish the same work?

1) $\frac{21}{2}$ days 2) $\frac{20}{3}$ days
3) $\frac{4}{9}$ days 4) $\frac{40}{9}$ days

18. $(\sec A + \tan A)(1 - \sin A) =$

1) cosecA 2) cosA
3) sec A 4) sinA

19. If A (–2, –1), B(a, 0), C (4, b) and D (1, 2) are the vertices of a parallelogram then value of a + b is

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

20. The population of a village is 25000. If the annual birth rate is 5.3 % and the annual death rate is 3.3 %, calculate the population after two years

1) 26100 2) 26010
3) 25010 4) 25100

Part–III – Mental Ability

21. Find the missing term in each of the following series.

2, 5, 9, 19, 37, ... ?

1) 73 2) 75

3) 78 4) 76

22. Choose the correct alternative from the given ones that will complete the series.

36, 34, 30, 28, 24, ... ?

1) 20 2) 23

3) 26 4) 22

23. Cattle : Herd : : Sheep : ?

1) Flock 2) Swarm

3) Mob 4) Shoal

24. Choose the word which is least like the other words in the groups.

1) Zebra 2) Lion

3) Horse 4) Tiger

25. In a certain code, TEACHER is written as VGCEJGT. How is CHILDREN written in that code ?

1) EJKNEGTP 2) EGKNFITP

3) EJKNFTGP 4) EJKNFGTO

26. Pointing towards a person, a man said to a woman, "His mother is the only daughter of your father". How is the woman related to that person ?

1) Daughter 2) Sister

3) Wife 4) Mother

27. A man is facing west. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anti-clockwise direction. Which direction is he facing now ?

1) South 2) North-west

3) South-west 4) West

28. If + means ×, × means –, ÷ means + and – means ÷, then which of the following gives the result of 175 – 25 ÷ 5 + 20 × 3 + 10 ?

1) 77 2) 160

3) 2370 4) 240

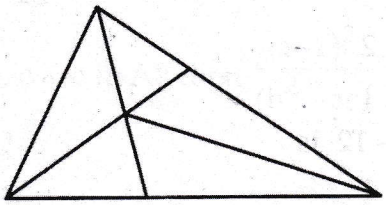
Space for Rough Work

29. There are some benches in a classroom. If 4 students sit on each bench, then 3 benches are left unoccupied. However, if 3 students sit on each bench, 3 students are left standing. How many students are there in the class ?

1) 36 2) 48

3) 64 4) 56

30. How many triangles are there in the following figure ?



1) 6 2) 10

3) 12 4) 11

Space for Rough Work

Section - B : (Part-I – Mathematics)

31. The largest number that will divide 396, 434 and 540 leaves the remainder 5, 9 and 13 respectively is

1) 15 2) 17
3) 13 4) 19

32. For the system of equation given by $\frac{4}{16x+24z}+\frac{12}{21x-14z}=\frac{1}{2}$ and $\frac{14}{4x+6z}+\frac{4}{3x-2z}=2$ find the value of $x - z =$

1) 7 2) 2
3) 6 4) 1

33. If $x = 3 + 3^{2/3} + 3^{1/3}$ then value of $x^3 - 9x^2 + 18x - 12$ is

1) 0 2) 1
3) –1 4) 2

34. If α, β be the roots of the equation $x^2 - 2x + 3 = 0$ then equation whose roots are $\frac{1}{\alpha^2}$ and $\frac{1}{\beta^2}$ is

1) $x^2 + 2x + 1 = 0$ 2) $9x^2 + 2x + 1 = 0$
3) $9x^2 - 2x + 1 = 0$ 4) $9x^2 + 2x - 1 = 0$

35. Solve the equation $6\left(x^2+\frac{1}{x^2}\right)-25\left(x-\frac{1}{x}\right)+12=0$ and find sum of all real values of 'x'

1) $\frac{15}{2}$ 2) $\frac{25}{6}$
3) 5 4) none of these

36. $x=3\sqrt{3}+\sqrt{26}$ then the value of $\frac{1}{2}\left(x+\frac{1}{x}\right)$ is

1) $2\sqrt{3}$ 2) $\sqrt{3}$
3) 27 4) $3\sqrt{3}$

37. If $x=\frac{1}{7+4\sqrt{3}}$ and $y=\frac{1}{7-4\sqrt{3}}$, then find value of λ for $5x^2 - 7xy - 5y^2 = -7(1 + \lambda\sqrt{3})$

1) 20 2) 40
3) 60 4) 80

38. If $x^{x^{3/2}}=\left(x^{3/2}\right)^x$ then the number of values of x are

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

39. The minute hand of a clock is $\frac{x}{2}$ cm long. Find the area of face of the clock described by minute hand in 35 minutes

1) $\frac{11x^2}{24}$ 2) $\frac{7x^2}{24}$

3) $\frac{3x^2}{24}$ 4) $\frac{13x^2}{24}$

40. If a, b, c are in AP then $\frac{(a-c)^2}{(b^2-ac)} =$

1) 2 2) 6

3) 4 4) 8

41. The number of terms of the AP 3, 7, 11, 15 ..... to be taken so that sum is 406

1) 13 2) 14

3) 15 4) 12

42. Two circles both of radia 'α' touch each other and each of them touches internally a circle of radius 2α then the diameter of the circle which touches all the three circles is

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

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

43. Sides other than the hypotanuse of a right angled triangle are of lengths 16 cm and 8 cm find the length of the side of largest square that can be inscribed in the triangle

1) $\frac{13}{3}$cm 2) $\frac{16}{3}$cm

3) $\frac{19}{3}$cm 4) none of these

44. $\cos1° + \cos2° + \cos3° + \ldots\ldots\ldots + \cos180° =$

1) 0 2) 1

3) –1 4) 2

45. An aeroplane flying horizontally 1 km above the ground is observed at an elevation of 60° and after 10 seconds the elevation is observed to be 30° the uniform speed of the aeroplane in km/hr is

1) 240 2) $240\sqrt{3}$

3) $60\sqrt{3}$ 4) none of these

46. If the radius of a sphere is increased by 10 % then its volume is increased by
1) 34 %
2) 32.1 %
3) 33 %
4) 33.1 %

47. A triangle with vertices (4, 0), (–1, –1) and (3, 5) is
1) right angled but not isosceles
2) isosceles but not right angled
3) isosceles and right angled
4) neither right angled nor isosceles

48. The point (a, b), (c, d) and $\left(\frac{kc+\ell a}{k+\ell}, \frac{kd+\ell b}{k+\ell}\right)$ are
1) vertices of an equilateral triangle
2) vertices of an isosceles triangle
3) vertices of a right angled triangle
4) collinear

49. From a box containing 100 tickets numbered 1, 2, 3, 4,.... 100. One ticket is drawn. If the number on this ticket is x, then the probability that $x+\frac{1}{x}>2$ is
1) 0
2) 1
3) 0.99
4) none of these

50. If the five out of seven data is 14, 12, 10, 4, 2 has mean and variance 8 and 16 respectively. Out of seven data, five data is given above. Find remaining two data
1) 7 and 6
2) 8 and 6
3) 6 and 9
4) 9 and 10

51. Make a match

A-Group		B-Group	
1)	Fluid	a)	Higher pressure
2)	Blunt knife	b)	Atmospheric pressure
3)	Sharp needle	c)	Specific gravity
4)	Relative density	d)	Lower pressure
5)	Hecto pascal	e)	Same pressure in all directions

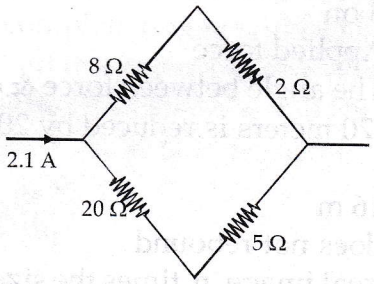
1) 1–e, 2–c, 3–a, 4–b, 5–d
2) 1–c, 2–a, 3–b, 4–e, 5–d
3) 1–e, 2–d, 3–a, 4–c, 5–b
4) 1–b, 2–c, 3–a, 4–e, 5–d

52. Complete the following tables.

	Mass (kg)	Volume (m^3)	Density (kg/m^3)
a)	350	100	----------
b)	----------	120	4

1) a) → 35 b) → 48
2) a) → 35×10^3 b) → 30
3) a) → 3.5 b) → 480
4) a) → 0.35 b) → 4.8

53. In the circuit shown in figure, the current flowing through 5Ω resistance is



1) 0.5 A
2) 0.9 A
3) 0.6 A
4) 1.5 A

54. A wire of resistance R is stretched to twice of it's original length, it's new resistance will be

1) 4R
2) R/4
3) 2R
4) R/2

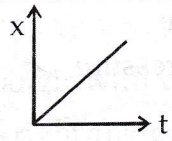
55. A thermally insulated pot has 150 g ice at temperature 0°C. How much steam of 100°c has to be mixed to it, so that water of temperature 50°C will be obtained. $L_f = 80$ cal/g $L_v = 540$ cal/g , $C_w = 1$ cal/g°C

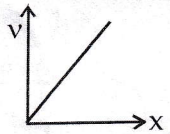
1) 33 kg
2) 3.3 g
3) 3.3 kg
4) 33 g

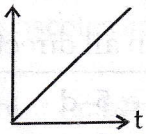
56. A convex lens is in contact with concave lens. The magnitude of the ratio of their focal length is 2/3. Their equivalent focal length is 30 cm. What are their individual focal lengths ?

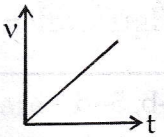
1) –75, 50
2) 10, –15
3) 75, 50
4) –10, 15

57. Which one of the following graph represents uniformly accelerated motion ? (where symbols represent usual meaning)

1) 

2) 

3) 

4) 

58. Two balls of masses 50 g and 100 g are moving along the same line and direction with velocities 3 m/s and 1.5 m/s respectively. They collide and after collision, the first ball moves with velocity 2.5 m/s. Determine velocity of second ball.
1) 1.75 m/s 2) 2 m/s
3) 3.5 m/s 4) 1.5 m/s

59. The number of images formed by two plane mirrors inclined at 60° of an object placed symmetrically between mirrors is
1) 6 2) 7
3) 5 4) infinite

60. The work done on an object does NOT depend on
1) Displacement 2) Applied force
3) Initial velocity of the object 4) The angle between force & displacement

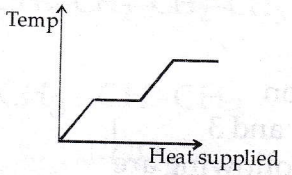
61. If the energy of a ball falling from a height of 20 meters is reduced by 20 %, how high will it rebound ?
1) 4 m 2) 16 m
3) 8 m 4) does not rebound

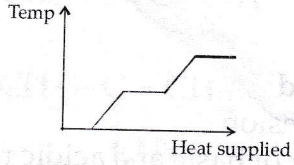
62. A concave mirror of focal length 'f' produces a real image 'n' times the size of the object. The distance of the object from the mirror is
1) f (n–1) 2) f (n+1)
3) $f\left(\frac{n+1}{n}\right)$ 4) $f\left(\frac{n-1}{n}\right)$

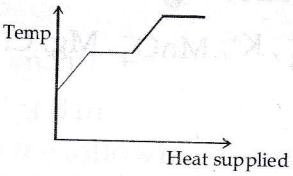
63. Echo is one of the phenomena of reflection of second. When we go to the mountain top and shout loudly, we hear our own sound after some time. What should be the minimum distance of the object for the echo to occur ? (v = 340 m/s)
1) 10 m 2) 34 m
3) 17 m 4) 68 m

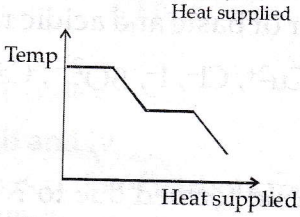
64. What will be the increase in length of a steel rod of length 0.2 m, when its temperature is increased by 50°C ? The coefficient of linear expansion of steel is $1.3 \times 10^{-5}\ °C^{-1}$.
1) 1.3×10^{-2} m 2) 1.3×10^{-5} m
3) 1.3×10^{-4} m 4) 1.3×10^{-3} m

65. A block of ice at –10°C is slowly heated and converted to steam at 100°C. Which of the following curves represents the phenomenon quantitively.

1) 

2) 

3) 

4) 

66. If sum of velocities of light in two media is 3.25×10^8 m/s and their difference is 0.75×10^8 m/s. Find the refractive index of the second medium with respect to first medium.

1) 1.6 2) 1.25
3) 1.5 4) 1.3

67. A converging lens is used to form an image on a screen. When upper half of the lens is covered by an opaque screen

1) half the image will disappear
2) complete image will be formed of same intensity
3) complete image will be formed of decreased intensity
4) half image will be formed of same intensity

68. The radius of planet P is half the radius of planet Q. If the mass of P is m_p, what must be the mass of Q so that the value of acceleration due to gravity (g) on Q is same that of its value on P ?

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

69. Make a match.

A-group	B-group	C-group
I. Mass	A) m/s^2	a) Zero at the centre
II. Weight	B) kg	b) Measure of inertia
III. Acceleration due to gravity	C) Nm^2/kg^2	c) Same in the entire universe
	D) N	d) Depends on height

1) I→B & b, II→D & d, III→A & b 2) I → B & b, II → D & a, III → A & d
3) I→B & a, II→C & d, III→D & c 4) I → D & a, II → B & b, III → C & c

70. Two thin, long, parallel wires seperated by a distance d carry a current i in the same direction. They will

1) Repel each other 2) Attract each other
3) Depend on material of the wire 4) Can't say

71. The orbital with highest energy is
1) 3p 2) 4s
3) 4d 4) 5s

72. Milk is
1) Colloid 2) Solution
3) Suspension 4) both 1 and 3

73. The number of basic and acidic radicals among the following are
$Ag^+, Cu^{2+}, Cl^-, I^-, SO_4^{2-}, Ca^{2+}, NO_3^-, S^{2-}, NH_4^+, K^+, MnO_4^-$, Mg, Cl
1) 6, 6 2) 6, 5
3) 5, 6 4) 7, 7

74. Covalent bond formed due to ?
1) Transfer of electron 2) Gain of electron
3) Loss of electron 4) Sharing of electron

75. When sodium hydroxide is added to ammonium carbonate salt and then a glass rod dipped in dilute hydrochloric acid is brought near the test tube, we observe
1) Brisk efflorescence 2) Dense white fumes
3) Yellowish green vapours 4) Reddish brown gas

76. At 25°C the pH of pure water is 7. The ratio of $[H^+]$ and $[OH^-]$ ions concentration is
1) 0.1 2) 1.0
3) 0.2 4) 1.2

77. Which of the following represent a chemical change ?
1) Extraction of copper from copper pyrites
2) Distillation of water
3) Melting of wax
4) Dissolution of salt in water

78. The ozone layer lies in
1) Stratosphere 2) Troposphere
3) Ionosphere 4) Mesosphere

79. To which class a dyes does phenolpthalein belong ?
1) Azo dyes 2) Nitro dyes
3) Triphenyl methane dyes 4) Phthalein dyes

80. Match the following compound.

	I		II
a)	CaO	i)	Table salt
b)	$Ca(OH)_2$	ii)	Slaked lime
c)	$CaCO_3$	iii)	Quick lime
d)	NaCl	iv)	Lime stone

1) a–iii, b–ii, c–iv, d–i 2) a–ii, b–iii, c–iv, d–i
3) a–i, b–ii, c–iii, d–iv 4) a–iv, b–iii, c–ii, d–i

81. Match the compound with its nature.

	Column-I		Column-II
i)	CO	p)	Acidic
ii)	CO_2	q)	Neutral
iii)	CaO	r)	Basic

1) i–r, ii–p, iii–q 2) i–p, ii–q, iii–r
3) i–q, ii–p, iii–r 4) i–p, ii–r, iii–q

82. Which among the following are unsaturated hydrocarbons ?

i) $CH_3–CH_2–CH_2–CH_3$

ii) $CH_3-C\equiv C-CH_3$

iii) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_3$

iv) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=CH_2$

1) i and iii
2) ii and iv
3) ii and iii
4) iii and iv

83. Match the following compounds with their mass ratio of carbon and hydrogen.

A)	CH_4	i)	12 : 1
B)	C_2H_6	ii)	3 : 1
C)	C_2H_2	iii)	4 : 1
D)	CH_2O	iv)	6 : 1

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

84. First member of ester homologous series is
1) Methyl ethanoate
2) Methyl methanoate
3) Methyl acetate
4) Acetic acid

85. Which of the following is liquid at room temperature ?
1) Methane
2) Ethane
3) Butane
4) Heptane

86. Which one of the following has highest ionisation energy ?
1) Li
2) K
3) Na
4) Rb

87. What will be the pressure in atmosphere if one mole of gas occupies 10 L volume at 200 K temperature ? (Given R = 0.0821 L atm K^{-1} mol^{-1})
1) 16.42 atm
2) 0.1642 atm
3) 1.642 atm
4) 2.461 atm

88. A pre-weighed vessel was filled with H_2 at STP and weighed. It was then evacuated and filled with O_2 at the same temperature and pressure and again weighed. The weight of O_2 will be
1) 16 times that of H_2
2) Half of that of H_2
3) One fourth of that of H_2
4) One sixtenth of that of H_2

89. The amount of calcium hydroxide formed when with 18 gram of water reacts with 28 gram of calcium oxide
1) 74 g
2) 56 g
3) 37 g
4) 28 g

90. The mass of one mole of electrons is (Given 1 e^- weighs 9.1×10^{-31} kg)
1) 8×10^{-25} g
2) 8.4×10^{-26} kg
3) 4.8×10^{-8} g
4) 5.48×10^{-4} g

Space For Rough Work

ST-23

IMPORTANT DATES	
SCREENING TEST (Shahu) - 2023 (OFFLINE MODE ONLY)	**02 Apr. 2023**
Online display of provisional answer keys	02 Apr. 2023 : 06 PM
Last Date Feedback and comments on Provisional Answer Keys from Candidates	04 Apr. 2023 : 06 PM
Online declaration of final answer keys	05 Apr. 2023 : 06 PM
Copy of candidate responses to be available on the website	07 Apr. 2023 After 02 PM
Result of SCREENING TEST 2022 (Indivisual Login)	07 Apr. 2023 After 02 PM
Parent's Meet (PCM GROUP)	09 Apr. 2023 at 02-30 PM
Parent's Meet (PCB GROUP)	09 Apr. 2023 at 11-00 AM
Admissions : First List	09 Apr. 2023 to 13 Apr. 2023 UPTO 06 PM
Admissions : Second List	15 Apr. 2023 to 18 Apr. 2023 UPTO 06 PM

वरील तारखांमध्ये काही बदल होऊ शकतो विद्यार्थी आणि पालकांनी अधिक माहितीसाठी वेबसाईट पाहणे.