Time: 2 ½ Hours **T-25 [SGCC]**

→ This paper is for the student going to class **10** in the yr 2025-26. (i.e. for the student presently in class **9**)

Maximum Marks: 75

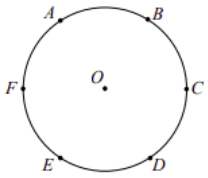
READ THE FOLLOWING INSTRUCTIONS BEFORE YOU START ANSWERING

1. In addition to the question paper, you are given **OMR** Sheet.
2. Fill up all the entries on the **OMR** Sheet carefully in the space provided in BLOCK Letters only. Incomplete/ incorrect/ carelessly filled in information may disqualify your candidature.
3. Do not fold/ damage/mutilate/spoil the OMR Sheet with unnecessary markings. Do not write anything on page -2 of **OMR** Sheet as it is evaluated by computer.
4. Use **black ink** or **blue ink** ball point pen and darken the appropriate circles in the answer sheet.
5. Ensure that the question paper consists of **75** questions. If the question paper found defective or otherwise, exchange with the correct question paper.
6. The question paper consists of **75** multiple choice questions with only one correct answer and each carries **One** mark. Blacken the appropriate circle completely corresponding to the correct answer (1/2/3/4) in **OMR** sheet.
7. There is **NO** negative marking.
8. The use of rulers, set squares and compasses is allowed, but calculators, protractors and electronic gadgets are forbidden.
9. No candidate is allowed to leave the hall till the completion of the examination.

Hall ticket number :____

Name of the candidate :____

1. Points A, B, C, D, E, and F are evenly spaced around the circle with centre O, as shown. The measure of ∠AOC is_____



(1) 150° (2) 144° (3) 120° (4) 108°

2. The remainder when 111 is divided by 10 is 1. The remainder when 111 is divided by the positive integer n is 6. The number of possible values of n is_____

(1) 4 (2) 5 (3) 6 (4) 7

3. The altitude of a cone (C) is divided into three equal parts and through the points of division planes are drawn parallel to the base. The volume of the cone (C) is equal to 27. Then the volume of its mid-portion is

(1) 7 (2) 6 (3) 8 (4) 9

4. $a^2 + b^2 + c^2 - 2ab + 2ac + 2bc$ is equal to square of _____.

(1) a + b − c (2) a + c − b (3) c − b − a (4) None of these

5. $\frac{x+4}{2x-5} \leq 0$ if and only if

(1) $x \leq -4 \text{ or } x > 5/2$ (2) $x \leq 5/2$

(3) $x \geq 5/2$ (4) None of these

6. A fair coin is tossed 3 times. What is the probability of at least two consecutive heads ?

(1) $\frac{1}{8}$ (2) $\frac{1}{4}$ (3) $\frac{3}{8}$ (4) $\frac{1}{2}$

7. The sum of three different positive integers is 2025. The largest of these three integers is n. The smallest possible value of n is_____

(1) 677 (2) 674 (3) 675 (4) 676

8. The circle 'ω' has centre O and square OPQR has vertex Q on the circle. If the area of 'ω' is 24π, the area of the square is_____

(1) 48 (2) 25 (3) 12 (4) 36

Space for rough work

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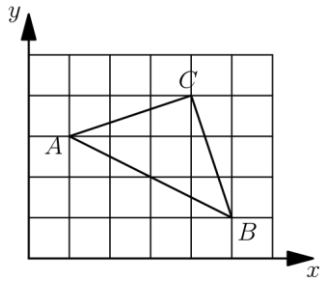
9. Trains arrive at [SG**CC**] Station every x minutes, where x is a positive integer. Trains arrive at [SG**CC**] Station at many different times, including at 10:10 a.m., 10:55 a.m., and 11:58 a.m. One of the following is a possible value of 'x'.
   (1) 10 (2) 7 (3) 9 (4) 11
10. Two of the sides of an isosceles triangle (T) measure (3x – 5)cm and (2x – 1)cm., and one of the interior angles is equal to 60^{o}. Then the perimeter of (T) is _____.
   (1) 24cm (2) 21cm (3) 12cm (4) 20cm
11. One million is equal to _____.
   (1) 10^{-6} (2) 10^{8} (3) 10^{7} (4) 10^{6}

12. A triangle with vertices as A = (1,3), B = (5,1) and C=(4,4) is plotted on a 6 × 5 grid. What fraction of the grid is covered by the triangle?



(1) $\frac{1}{6}$ (2) $\frac{1}{5}$ (3) $\frac{1}{4}$ (4) $\frac{1}{2}$

13. If the median of the data 20, 25, 65, 31, x is 25, then the interval of x can be:
(1) $25 > x > 20$ (2) $x \geq 65$
(3) x lies strictly between 25 and 31 (4) x lies between 31 and 65

14. $x(y^2 - z^2) + y(z^2 - x^2) + z(x^2 - y^2)$ is equal to_____
(1) $(y - z)(z - x)(x - y)$ (2) $-(y - z)(z - x)(x - y)$
(3) $2(y - z)(z - x)(x - y)$ (4) $-2(y - z)(z - x)(x - y)$

15. The ratio $\frac{10^{23} + 10^{25}}{2(10^{24})}$ is closest to the integer N, then N =_____.
(1) 5 (2) 4 (3) 6 (4) 7

16. If the real numbers x, y, z are such that $x^2 + y^2 + 4z^2 = xy + 2yz + 2zx$, then which of the following is a correct relation
(1) $2x = z$ (2) $2y = z$ (3) $x = y$ (4) $x + y = 0$

17. If $x + \frac{1}{x} = 1$ then $x^{25} + \frac{1}{x^{25}} =$_____.
(1) 25 (2) –1 (3) +1 (4) 2

18. If $(5)^{2x-1} - (25)^{x-1} = 2500$, then x =_____.
(1) 10 (2) 5 (3) 2 (4) 3

19. A teams record is 20 wins and 25 losses. To qualify for the finals a team has to win 60% of the games played. The minimum number of wins of the remaining 16 games necessary for the team to qualify is_____
(1) 13 (2) 10
(3) 15 (4) Impossible to achieve

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20. $\left(4+\sqrt{15}\right)\left(\sqrt{10}-\sqrt{6}\right)\left(\sqrt{4-\sqrt{15}}\right)$ = _____

(1) $\sqrt{3}$ (2) $\sqrt{5}$ (3) $\frac{5}{2}$ (4) 2

21. Consider the following statements:
A: If p, q are primes and $p \neq q$ then the greatest common factor of $p$and q is 1
B: If p, q are natural numbers whose greatest common divisor is '1' then p, q are primes
(1) A is true but B is false (2) A and B are both true
(3) A is false but B is true (4) A and B are both false

22. If $\log(xy^3) = 1$ and $\log(yx^2) = 1$, what is $\log(xy)$?
(1) $\frac{-1}{2}$ (2) $\frac{24}{25}$ (3) $\frac{+1}{2}$ (4) $\frac{+3}{5}$

23. In triangle ABC, AB = BC = 29, and AC = 42. What is the area of triangle ABC ?
(1) 100 (2) 420 (3) 500 (4) 609

24. The line with equation y = 20x + 24 is translated 25 units to the right. The equation of the resulting line is_____
(1) y = 20x + 3 (2) y = 20x – 476 (3) y = 20x – 524 (4) y = 20x – 49

25. Suppose that $a = \frac{1}{n}$, where 'n' is a positive integer with $n > 1$. Which of the following statements is true?
(1) $a < \frac{1}{a} < a^2$ (2) $a^2 < a < \frac{1}{a}$ (3) $a < a^2 < \frac{1}{a}$ (4) $\frac{1}{a} < a < a^2$

26. A train moving with a uniform speed of 54 kmph. It's speed in m/s is
(1) 15 m/s (2) 1.5 m/s (3) 9 m/s (4) 90 m/s

27. When an object undergoes acceleration
(1) there is always an increase in its velocity
(2) there is always an increase in its speed
(3) a force always acting on it (4) all of the above.

28. A truck covers 40 km with an average speed of 80km/h. Then it travels another 40 km with an average speed of 40 km/h. The average speed of the truck for the total distanced covered is
(1) 40 km/h (2) 45 km/h (3) 48 km/h (4) 53 km/h

29. The specific gravity of a solid glass sphere whose weight in air is 10N and 6N in water is _____
(1) 1.5 (2) 3.5 (3) 2.5 (4) 0.5

30. A car starts from city A and it travels 50 km in a straight line to city B. Immediately it turns around, and returns to city A. It took 2 hours for this round trip. The average speed of the car for this round trip is
(1) 0 km/h (2) 25 km/h (3) 50 km/h (4) 100 km/h

31. The equation v = u + at gives information as
(1) velocity is a function of time. (2) velocity is a function of position.
(3) Position is a function of time. (4) Position is function of velocity and time.

32. If a bus starts suddenly, the passengers in the bus will tend to fall
(1) In the direction opposite to the direction of motion of bus.
(2) In the same direction as the direction of motion of bus.
(3) Sideways. (4) None of the above.

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33. An athlete runs some distance before taking a long jump because
    (1) He gains energy to take him through long distance.
    (2) It helps him to apply large force.
    (3) By running action and reaction forces increase.
    (4) By running the athlete gives himself larger inertia of motion.
34. A driver accelerates his car first at the rate of 1.8 m/s^2 and then at the rate of 1.2 m/s^2. The ratio of the two forces exerted by the engine in the two cases will be
    (1) 1 : 2 (2) 2 : 1 (3) 2 : 3 (4) 3 : 2
35. A rocket or jet engine works on the principle of
    (1) Conservation of energy (2) Conservation of momentum
    (3) Conservation of mass (4) Newton's second law of motion.

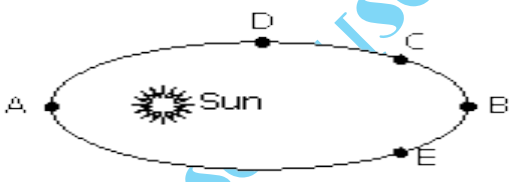
36. The action and reaction forces referred to in the third law
(1) Must act on the same object. (2) May act on different objects.
(3) Must act on different objects.
(4) Need not be equal in magnitude but must have the same direction.

37. Equal volumes of water (of specific gravity 1) and alcohol (of specific gravity 0.8) are mixed together. The density of mixture is _____
(1) 0.8 (2) 0.9 (3) 0.6 (4) 0.4

38. If 'r' represents the radius of the orbit of a satellite of mass 'm' moving round a planet of mass 'M', the velocity of the satellite is given by
(1) $v^2 = \frac{gM}{r}$ (2) $v^2 = \frac{GMm}{r}$ (3) $v = \sqrt{\frac{GM}{r}}$ (4) $v = \frac{GM}{r^2}$

39. If the earth is $1/4^{th}$ of its present distance from the sun, the duration of the year would be
(1) 1/4 of the present year 2) 1/6 of the present year
(3) 1/8 of the present year 4) 1/16 of the present year

40. The planet mercury is revolving in an elliptical orbit around the sun as shown in figure. The kinetic energy of mercury will be greater at



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

41. Force of friction can be reduced by help of
(1) ball bearing (2) lubricants (3) cushion surfaces (4) all of them

42. There will be great distance in stopping a vehicle which is moving
(1) Slowly (2) Steady (3) Fastly (4) continuously

43. A car travels a distance of 15 km with a constant force of 500 N, its work done is
(1) 7500000 J (2) 30 J (3) 15500 J (4) 14500 J

44. An object is lifted 5 m above the levelled ground. If the mass of the object is 20 kg and gravitational pull is 10 N/kg, Potential energy of the object is _____
(1) 40 J (2) 1000 J (3) 2.5 J (4) 0.4 J

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45. A person accidentally dropped his mobile phone from balcony. If mass of the mobile phone is 0.6 kg and height from where mobile phone was dropped is 120 m, potential energy of the mobile phone is _____. ($g = 10\ m/s^2$)
(1) 7.2 J (2) 200 J (3) 72 J (4) 720 J

46. A block of wood floats in water with $2/3^{rd}$ of its volume submerged. In some oil $2/9^{th}$ of its volume is submerged. Then
(1) density of wood is 2/3 g/cc & density of oil is 3 g/cc
(2) density of wood is 2/5 g/cc & density of oil is 2 g/cc
(3) density of wood is 3/7 g/cc & density of oil is 1.5 g/cc
(4) density of wood is 11/7 g/cc & density of oil is 1.8 g/cc

47. A gun fires 8 bullets per second into a target X. If the mass of each bullet is 3 g and its speed 600 ms^{-1}. Then the power delivered by the bullets is _____
(1) 4320 W (2) 2530 W (3) 1258 W (4) 658 W

48. A point object is placed at a distance of 20 cm from a convex mirror of focal length 20 cm. The image will form
(1) at infinity (2) at focus
(3) at the pole (4) behind the mirror

49. The time period of an electromagnetic waves is 10^{-15} seconds. What is the frequency of wave in hertz ?
(1) 10^{5} (2) 10^{25} (3) 10^{15} (4) 10^{30}

50. The image formed by a concave lens can be
(1) virtual and magnified (2) virtual and diminished
(3) virtual and of same size (4) virtual image is not formed

51. Hydrogen Peroxide (H_2O_2) is a colorless liquid with a slightly sharp odor. Hydrogen peroxide can cause irritation to the eyes, nose, skin, and throat. Workers may be harmed from exposure to hydrogen peroxide. Mass of five moles of it is:
(1) 170g (2) 150g (3) 90g (4) 50g

52. Factors affecting the process "EVOPARATION" is/are___
(1) Humidity in air (2) Wind Speed
(3) Surface area (4) All of these

53. Rate of diffusion is fastest in:
(1) Solids (2) Liquids (3) Gases (4) None of these

54. The first model of an atom was given by:
(1) J.J.Thomson (2) N.Bohr
(3) Rutherford (4) E.Goldstein

55. Number of covalent bonds in ethylene molecule is:
(1) 7 (2) 6 (3) 2 (4) 5

56. The mass number of an atom is 27 and number of neutrons is 14. Number of electrons in a tripositive ion of this atom is:
(1) 16 (2) 13 (3) 10 (4) 14

57. One among the following that would be highly compressible is:
(1) Diamond (2) Water
(3) Sodium Chloride (4) Nitrogen

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58. The most metallic of the following elements is_____
(1) Mg (2) Li (3) K (4) Ca

59. Iron is separately reacted with chlorine gas and dil.HCl solution under given conditions. The compounds formed respectively are:
(1) FeCl, $FeCl_2$ (2) $FeCl_3$, $FeCl_2$ (3) Fe_2Cl,Fe_2Cl_3 (4)$FeCl_2$,FeH

60. A piece of sodium is dropped in water when NaOH and Hydrogen gas are formed. Moles of hydrogen that would be formed along with 80g of NaOH are:
(1) 7 (2) 1 (3) 6 (4) 4

61. The relationship between Fahrenheit and Celsius temperatures is 5 (°F-32)/9 = °C. The boiling point of water in Fahrenheit temperature is:
(1) 148 (2) 180 (3) 177 (4) 212

62. A 200 cc NaOH solution (density =1.33 g/cm^3) has concentration 30% by mass and is diluted to 10% by mass. Mass (volume) of water (d=1g/cc) that must be used for the dilution is:
(1) 800 (2) 400 (3) 532 (4) 500

63. Number of atoms in a 100 mg sample of 81% by mass pure Al (AW=27u) is:
(1) $0.3N_0$ (2)$3N_0$ (3) $0.03N_0$ (4) $0.003N_0$

64. The formula of potash alum is $K_2SO_4.Al_2(SO_4)_3.24\ H_2O$. Number of elements present in one formula unit of it is:
(1) 9 (2) 6 (3) 4 (4) 5

65. Mass of oxygen in 1g of lime stone is:
(1) 4.8mg (2) 0.48mg (3) 480mg (4) 48mg

66. The acidic and basic radicals in ammonium sulphide are respectively_____.
(1) NH_3^+, SO_3^- (2) NH_2^-, SO_2^- (3) NH_4^+, S^{2-} (4) N^{3+}, P^{3-}

67. The distribution of electrons in an atom (Z=11) is_____.
(1) 2, 8,1 (2) 2, 4, 4, 1 (3) 1, 7, 2, 1 (4) 5, 2, 1, 3

68. In the formation of sodium chloride from sodium and chlorine,_____ is oxidized.
(1) Cl (2) both Na and Cl (3) Na (4) Neither of them

69. Among the following the one with same number of electrons as they are in N_2O is:
(1) CO (2) SO_3 (3) NO_2 (4) CO_2

70. The number of moles of electrons in 5.4 g of water is _____.
(1) 1.0 N_0 (2) 2.0 N_0 (3) 3.0 N_0 (5) 0.1 N_0

71. The gas that would be released when Cu powder is added to dilute HCl solution is:
(1) Oxygen (2) Hydrogen (3) Chlorine (4) None of these

72. 5g of KNO_3 are dissolved in 495g of water. The % by mass of KNO_3 solution is:
(1) 10 (2) 1 (3) 5 (4) 15

73. The oxoacid formed when CO_2 gas is dissolved under pressure in water is:
(1) H_2CO_3 (2) HCO_3 (3) HCO_2 (4) $H_2C_2O_4$

74. A sample of air is found to contain 20%(V/V) Oxygen gas. Volume of air that would be needed to completely burn 0.2 m^3 of hydrogen gas in standard conditions is:
(1) 10L (2) 1000 mL (3) 500 L (4) 0.2 m^3

75. The metal hydroxide among the following that would react with Al to release hydrogen gas is:
(1) Cu $(OH)_2$ (2) NaOH (3) $Mg(OH)_2$ (4) $Ca(OH)_2$

Paper Ends

Dear Parent,

We deem it our privilege that you have chosen our **INSTITUTE** for your child's career. You are requested to note that the results of the successful candidates will be communicated to you on **7th** of this month.

(Y. SubrahmanyaSarma)

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