IMPORTANT INSTRUCTIONS

- The maximum marks are **300.** Time allotted is **90 MINTUES.**
- There are four sections in the question paper having total **75 questions:**
  - Section – A : Maths (20 Questions)
  - Section – B : Science (20 Questions)
  - Section – C : English (20 Questions)
  - Section – D : Aptitude (15 Questions)
- Each question carries **4 marks**
- **Negative Marking**: **1/4 (one-fourth) marks** will be deducted for every incorrect answer.
- **Use only BLUE / BLACK pen to fill the circles in bubble sheet.**
- Use of pencil is strictly **not allowed.**
- **Do not use marker or correction pen** to hide the mark

SECTION – A MATHS

1. The value of $\sqrt{27-10\sqrt{2}}$ is

   (a) $5-\sqrt{2}$ (b) $\sqrt{2}-5$ (c) either 1 or 2 (d) neither 1 nor 2

2. The value of $\frac{4(xyz)^3\times(x^2yz)}{2(xyz)^4}$

   (a) $2x$ (b) $2y$ (c) $2z$ (d) 2

3. The factors of the polynomial $ab(c^2+1)+c(a^2+b^2)$ are

   (a) $(bc+a)(ac+b)$ (b) $(bc+a)(ab+c)$ (c) $(b+a)(c+b)$ (d) $(b+a)(ac+b)$

4. If P is a point on line segment AB, then which of the following is true?

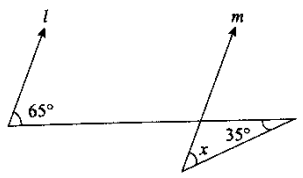
   (a) A line can be drawn parallel to AB through P.

   (b) A line can be drawn perpendicular to AB through P.

   (c) AP + PB > AB

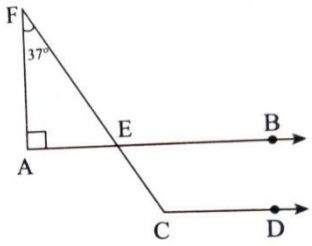
   (d) AP + PB < AB

5. In the given fig. $l \parallel m$. What is the value of x?



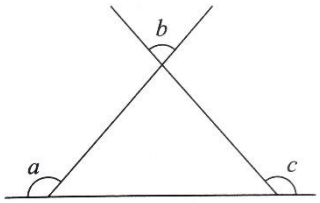
(a) 40° (b) 50° (c) 30° (d) 35°

6. In the given fig. EB ∥ CD, then ∠ECD is



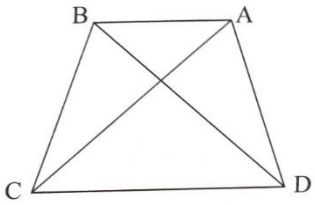
(a) 125° (b) 126° (c) 127° (d) 128°

7. In the given fig. what is the value of b in terms of a and c?



(a) $a + c + 180^{\circ}$ (b) $180^{\circ} - a + c$ (c) $a + c - 180^{\circ}$ (d) $a - c + 180^{\circ}$

8. In the given quadrilateral fig. if the following conditions hold, then choose the correct statement.
Condition (i) : AD = BC Condition (ii) : $\angle DAB = \angle CBA$



(a) $\angle ABD = \frac{1}{2}(\angle BAC)$ (b) $\angle ABD = \angle BAC$
(c) $\angle ABD > \angle BAC$ (d) $\angle ABD < \angle BAC$

9. If the radius and the slant height of a right circular cone are $\frac{r}{2}$ and 21, respectively, then its TSA is

(a) $\pi\frac{r}{4}(21 + r)$ (b) $\pi r\left(21 + \frac{r}{2}\right)$ (c) $\pi r\left(21 + \frac{r}{4}\right)$ (d) $\pi\frac{r}{2}\left(21 + \frac{r}{2}\right)$

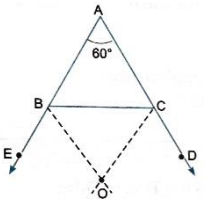
10. If a cone of the maximum height is cut off from a cylinder of radius 7 cm and height 24 cm, then the volume of the cylinder left is

(a) 4664 cm^3 (b) 2664 cm^3 (c) 2446 cm (d) 2464 cm^3

11. If the polynomials $az^3 + 4z^2 + 3z - 4$ and $z^3 - 4z + a$ leave the same remainder when divided by $z - 3$, find the value of a.

(a) 0 (b) 1 (c) -1 (d) none of these

12. In the given fig. BO, CO are the bisectors of external angles $\angle CBE$ and $\angle BCD$ respectively of ΔABC. Then $\angle BOC$ is equal to



(a) 120° (b) 30° (c) 60° (d) 150°

13. Match option of column I with the appropriate option of Column II.

Column I	Column II
(i) If the vertical angle P of an isosceles triangle PQR is 120° then $\angle Q$ is	(A) 70°
(ii) In ΔABC, if AB = AC and $\angle B = 70^\circ$, then $\angle C$ is	(B) 90°
(iii) Angles of a triangle are in the ratio 2: 3 : 4. The largest angle of the triangle is	(C) 30°
(iv) In an isosceles triangle PQR, PQ = PR and QP is produced to S, such that PQ = PS then $\angle QRS$ is	(D) 80°

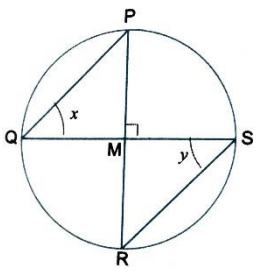
(a) (i) → (C) (ii) → (A) (iii) → (D) (iv) → (B)
(b) (i) → (D) (ii) → (A) (iii) → (C) (iv) → (B)
(c) (i) → (C) (ii) → (B) (iii) → (D) (iv) → (A)
(d) (i) → (C) (ii) → (A) (iii) → (D) (iv) → (B)

14. Match option of Column I with the appropriate option of column II

Column I	Column II
(i) A quadrilateral in which both pairs of opposite sides are parallel.	(A) kite
(ii) A quadrilateral in which a pair of opposite side is parallel.	(B) square
(iii) A quadrilateral in which two pairs of adjacent sides are equal.	(C) parallelogram
(iv) A quadrilateral whose all the sides are equal and each angle is 90°	(D) trapezium

(a) (i) → (C) (ii) → (A) (iii) → (D) (iv) → (B)
(b) (i) → (C) (ii) → (D) (iii) → (A) (iv) → (B)
(c) (i) → (D) (ii) → (C) (iii) → (B) (iv) → (A)
(d) (i) → (C) (ii) → (B) (iii) → (A) (iv) → (D)

15. In the given fig. $x + y$ is equal to

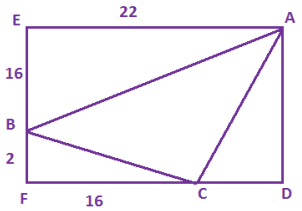


(a) 100° (b) 45° (c) 90° (d) 180°

16. If the perimeter of an isosceles triangle is 11 cm and its base is 5 cm, then find the area of given triangle.
(a) $\frac{5}{4}\sqrt{11}$ cm^2 (b) $9\sqrt{3}$ cm^2 (c) $20\sqrt{2}$ cm^2 (d) none of these

17. A sum of money compounded annually becomes ₹ 625 in two years and ₹ 675 in three years. The rate of interest per annum is
(a) 7% (b) 8% (c) 6% (d) 5%

18. In the given fig. EADF is a rectangle and ABC is a triangle whose vertices lie on the sides of EADF and AE = 22, BE = 6, CF = 16 and BF = 2. Find the length of the line joining the mid-points of the sides AB and BC. Hence, area of ΔPQR would be $\frac{1}{4}$ the area of $\Delta ABC = \frac{1}{4} \times 20 = 5$ sq. units.



(a) $4\sqrt{2}$ (b) 5 (c) 3.5 (d) None of these

19. A right circular cone, a right circular cylinder and a hemisphere, all have the same radius, and the heights of the cone and cylinder equal to their diameters. Then their volumes are proportional respectively to
(a) 1 : 3 : 1 (b) 2 : 1 : 3 (c) 3 : 2 : 1 (d) 1 : 2 : 3

20. A circle is inscribed in a given square and another circle is circumscribed about the square. What is the ratio of the area of the inscribed circle to that of the circumscribed circle?
(a) 2 : 3 (b) 3 : 4 (c) 1 : 4 (d) 1 : 2

SECTION – B
SCIENCE

21. Which of the cell organelles is concerned with oxidation of food?
(a) Endoplasmic reticulum (b) Mitochondria
(c) Plastids (d) Chloroplast

22. The "blueprints" in a cell that control all its activity are the
(a) Monosaccharides (c) DNA molecules
(c) Ribosomes (d) Proteins

23. The cells which never get tired
(a) Cardiac Muscle (b) Striated Muscles
(c) Non-Striated Muscles (d) All of these

24. How far does the space shuttle travel in the first 8 minutes?
(a) 8,000 m (b) 3733 km (c) 2,016 km (d) 2,600 km

25. A car starts from rest and accelerates uniformly over a time of 5.21 seconds for a distance of 110 m. Determine the acceleration of the car.
(a) 6.10 m s^{-2} (b) 8.10 m s^{-2} (c) 10.10 m s^{-2} (d) 12.10 m s^{-2}

26. A force acts for 10 s on a body of mass 10 kg after which the forces ceases and the body travels 50 m in the next 5 s. Find the magnitude of the force.
(a) 5 N (b) 10 N (c) 15 N (d) 50 N

27. China wares are wrapped in straw or paper before packing. What is the basis of this application?
(a) Impulse (b) Momentum (c) Acceleration (d) Force

28. A stone is thrown upwards with a speed 'u' from the top of a tower. It reaches the ground with a velocity '3u'. Find the height of the tower.
(a) $\sqrt{3}$ (b) $\frac{2u^2}{g}$ (c) $\frac{3u^2}{g}$ (d) $\frac{4u^2}{g}$

29. A freely falling body covers half of its journey from the top of a tower in 0.5 s. What is the height of the tower?
(a) 4.9 m (b) 2.45 m (c) 9.8 m (d) 9 m

30. A wooden cylinder floats vertically in water with one fourth of its length immersed. What will be the density of wood?
(a) It equals to the density of water. (b) It equals to half the density of water.
(c) It equals to one fourth the density of water. (d) It equals to three fourths the density of water.

31. By how much does the kinetic energy of a particle increase if the velocity is increased by a factor of three?
(a) 6 (b) 7 (c) 8 (d) 9

32. Which of the following have a regular, repeated molecular pattern and large number of free surfaces in three dimensional space?
(a) Solids and liquids (b) Liquids and gases
(c) Solids (d) Gases

33. Which of the following will diffuse faster than the others?
(a) Water (b) Petrol (c) Perfume (d) Milk

34. Which of the following obey the law of constant proportions in their formation?
(a) Mixtures (b) Compounds (c) Elements (d) Colloids

35. The size of a colloidal particle is
(a) 10^{-1} to 10^{-3} cm (b) 10^{-5} to 10^{-7} cm
(c) 10^{-8} to 10^{-5} cm (d) 10^{-6} to 10^{-8} cm

36. Identify the symbols of lead and mercury respectively.
(a) Hg, Pb (b) Pb, Hg (c) Le, Me (d) Ld, My

37. Identify the correct increasing order of molecular weights of the given compounds.
(a) $H_2O > H_2S > CO_2 > SO_2$ (b) $H_2O > H_2S < CO_2 > SO_2$
(c) $H_2O < H_2S < CO_2 < SO_2$ (d) $H_2O > H_2S > CO_2 < SO_2$

38. If the formula of chromic acid is H_2CrO_4, then what is the formula of divalent metal chromate?
(a) $MCrO_4$ (b) M_2CrO_4 (c) $M_2(CrO_4)_3$ (d) M_3CrO_4

39. Identify the pair of substances having the same formula unit mass.
(a) Calcium chloride, potassium carbonate (b) Calcium oxide, hydrochloric acid
(c) Carbon monoxide, ammonia (d) Carbon dioxide, nitrous oxide

40. If the formula of a chloride of a metal M is MCl_3, then what will be the formula of the phosphate of metal M?
(a) MPO_4 (b) M_2PO_4 (c) M_3PO_4 (d) $M_2(PO_4)_3$

SECTION – C
ENGLISH

- **Read the passage and answer the following questions.**
The fly was finally hers. It has taken Mini hours to trap it, but now, exhausted, it buzzed and crashed hopelessly around inside a pickle jar. Kneeling on a chair, she took a chapatti and spread it with a thick layer of butter, wiping the knife clean against the edge of the dish, the way her mother used to and savoured her victory. She was again in control.

41. The event of trapping the fly is compared with _____.
(a) the taste of chapatti and butter (b) a war followed by celebrations
(c) a celebration by the victor (d) the defeat of the oppressed

42. Which of the following expressions would you use to describe Mini's emotions after trapping the fly?
(a) On cloud ten (b) Under a cloud (c) On cloud nine (d) Every dark cloud has a silver lining

Word and Structure Knowledge

43. Choose the right word / phrase that completes the sentence.
You _____visit your friends once in a while.
(a) will (b) should (c) ought to (d) must

44. Select most suitable and correct option to fill the blanks.
The _____ water left in the well, had also dried up.
(a) a little (b) a few (c) few (d) little

45. How _____ do you eat chocolate?
(a) rarely (b) often (c) frequently (d) easily

46. Choose the odd one:
(a) sniff (b) inhale (c) breathe in (d) chuckle

47. Select correct option (articles) to fill the blanks.
_____ Cholera has broken out in the village.
(a) The (b) A (c) An (d) No article

48. Select suitable option (phrasal verb) to fill the blanks.
Never _____ . Try and try until you succeed.
(a) give away (b) give up (c) give to (d) give for

49. Choose the part of the sentence that contains an error. If there is no error, choose D.
They said / (a) they will call us / (b) until their plane lands. / (c) No error (d)

50. Choose the part of the sentence that contains an error. If there is no error, choose D.
Most of the pollution / (a) in Delhi / (b) is caused by fuel emissions. / (c) No error (d)

51. Choose the best option to replace the highlighted word:
Once she was comfortable with us she opened up, displaying a sharp and **inquisitive** mind.
(a) eager (b) aggressive (c) curious (d) boisterous

52. Choose an appropriate option:
Your library loans are now overdue; _____ you will be charged fifty paise per day, per item, up to maximum charge of sixty rupees each.
(a) however (b) therefore (c) moreover (d) instead

53. Fill in the blank with the most appropriate option:
The promises I have _____ to my parents are to be kept up.
(a) been done (b) done (c) making (d) made

54. Read the sentence and complete it with a question tag.
You didn't tell dad that I failed in maths.
(a) Can You? (b) Will You? (c) Would you? (d) Did you?

55. Choose the option with the same meaning as the idiom.
The class 'got out of hand' as the teacher was unwell.
(a) To get the hands out (b) To separate the hands
(c) To get out of control (d) To release the hands

56. Select the correctly punctuated sentence:
A season is a division of the year marked by changes in weather ecology and amount of daylight on earth seasons result from earth's orbit around the sun and earth's axial tilt relative to the ecliptic plane.

(a) A season is a division of the year marked by changes in weather; ecology; and amount of daylight. On Earth seasons result from Earth's orbit around the Sun and Earth's axial tilt relative to the ecliptic plane.
(b) A season is a division of the year marked by changes in weather, ecology, and amount of daylight. On earth, seasons result from Earth's orbit around the Sun and Earth's axial tilt relative to the ecliptic plane.
(c) A season is a division of the year marked by changes in weather ecology and amount of daylight. On Earth seasons result from Earth's orbit around the Sun and Earth's axial tilt relative to the ecliptic plane.
(d) A season is a division of the year marked by changes in weather, ecology and amount of daylight. On Earth seasons result from Earth's orbit around the Sun and Earth's axial tilt relative to the ecliptic plane.

57. Rearrange the given sentences into a meaningful sequence. The first and last sentences are already aligned for you:
P : A mere fifteen hundred years ago, English was a fledging language spoken by a few thousand people in many countries..
Q : As a result of this remarkable flexibility, English is today's international language.
R : The English language can be divided into three main periods – Old English, Middle English and Modern English.
S : English has achieved its global status because of an unusual and amazing ability to respond and change according to the needs of its users.
T : Today English is a thriving, vigorous language spoken by nearly one-fourth of the population of the world.
U : The separations reflect the impact of various cultural and historical events on the growth and development of English.

(a) TSQR (b) QRST (c) TSRQ (d) TRSQ

58. Choose the correct spelling of the word.
(a) Believe (b) Believi (c) Believ (d) Beleev

59. Choose the correct option.

"I am happy to inspire so many people, _____ women and mother," said Marry Kom.
(a) and (b) special (c) especially (d) also

60. Choose the correct option to complete the dialogue.

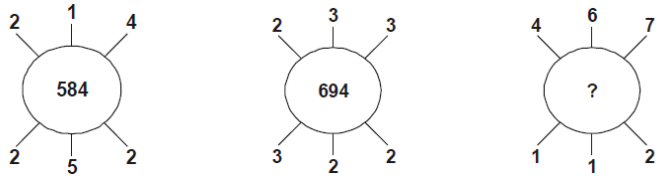
Teacher to Student : I thought you had been doing your homework regularly. Why are you still so irregular with your work?
(a) I will let your parents know that you have failed this year.
(b) I'm afraid, at this rate, I'II have to give you a 'D' grade.
(c) I'm expecting you to earn a 'D' grade.
(d) I think you will do well this year.

SECTION – D
APTITUDE

61. Pointing to a woman in a photograph, a man says, "She is the grandmother of the son of my daughter-in-law's mother-in-law". How is the woman related to the man?
(a) Mother (b) Mother-in-law (c) Sister (d) Wife

62. One-third of the boys and one-half of the girls of a college participated in a social work project. If the number of students who participated is 300 out of which 100 are boys, then what is the number of students in the college?
(a) 500 (b) 600 (c) 700 (d) 800

63. Find the missing number:



(a) 937 (b) 824 (c) 769 (d) 678

64. If L denotes ÷, M denotes ×, P denotes + and Q denotes −, then which of the following statements is true?
(a) 32 P 8 L 16 Q 4 = $-\frac{3}{2}$ (b) 6 M 18 Q 26 L 13 P 7 = $\frac{173}{13}$
(c) 11 M 34 L 17 Q 8 L 3 = $\frac{38}{3}$ (d) 9 P 9 L 9 Q 9 M 9 = − 71

65. In a certain code '256' means 'you are good'; '637' means 'we are bad' and '358' means 'good and bad'. Which of the following represents 'and in that code?
(a) 2 (b) 5 (c) 8 (d) 3

Directions: (66–68) Study the following information carefully and answer the questions given below:
Abhi, Raman, Kalindi, Rohit, Gauri, Sameer and Chetan participate in a series of car races. Everyone finishes each race and there are no ties. Raman's place is exactly ahead of Kalindi. Gauri's place is exactly after Rohit. Either Abhi's place is first and Sameer's place is last, or Sameer has first and Abhi has last place.

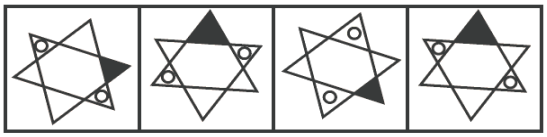
66. If Gauri's place is exactly ahead of Raman, then which of the following positions could be the Rohit's position?
(a) 2nd (b) 4th (c) 2nd or 3rd (d) 2nd or 3rd or 4th

67. Find the option that cannot be true?
(a) Raman is 3rd (b) Raman is 6th (c) Rohit is 2nd (d) Gauri is 4th

68. If exactly two positions are there between Abhi and Kalindi, then find the true statement.
(a) Abhi becomes 1st (b) Sameer becomes 1st (c) Raman becomes 2nd (d)Rohit becomes 5th

Directions: (69 – 71) In each problem, out of the four figures marked (i) (ii), (iii) and (iv), three are similar in a certain manner. However, one figure is not like the other three. Choose the figure which is different from the rest.

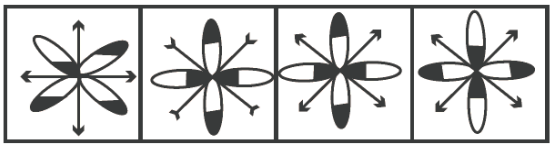
69. Choose the figure which is different from the rest.



(i) (ii) (iii) (iv)

(a) i (b) ii (c) iii (d) iv

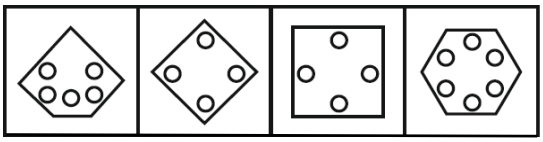
70. Choose the figure which is different from the rest.



(i) (ii) (iii) (iv)

(a) i (b) ii (c) iii (d) iv

71. Choose the figure which is different from the rest.



(i) (ii) (iii) (iv)

(a) i (b) ii (c) iii (d) iv

72. In a certain code language, "Tom Kun Sud" means "dogs are barking", "Kun Jo Mop" means "dogs and horses" and "Mut Tom Ko" means "Donkeys are mad". Which word in the given language means "Barking"?

(a) Kun (b) Jo (c) Sud (d) Ko

73. A boy was asked to multiply a given number by $(\frac{8}{17})$. Instead, he divided the given number by $(\frac{8}{17})$ and got the result 225 more than what he would have got if he had multiplied the number by $(\frac{8}{17})$. The given number was_____.

(a) 8 (b) 17 (c) 64 (d) 136

74. Gaurav walks 20 metres towards North. He then turns left and walks 40 metres. He again turns left and walks 20 metres. Further, he moves 20 metres after turning to the right. How far is he from his original position?

(a) 20 metres (b) 30 metres (c) 60 metres (d) 40 metres

75. In the series given below, one term is wrong. Find out the wrong term.
5, 10, 40, 80, 320, 550, 2560

(a) 80 (b) 320 (c) 550 (d) 2560