

PRATAPGARH TALENT SEARCH EXAMINATION-2022

PRATAPGARH TALENT SEARCH EXAMINATION-2022

DATE:, VENUE-EINSTEIN PUBLIC SCHOOL, LALGANJ (AJHARA)

INSTRUCTIONS

Note – Do not open this test Booklet until you are told to do so.

Time 3:00 hrs

Max. Marks – 100

Write your Roll no. in Box

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- ❖ To mark answer use black/blue ball – Point Pen only
- ❖ Candidate must read all the instructions before writing answer
- ❖ You are to mark your answer on answer-sheet only. When the examination is over, handover the Answer-sheet to the invigilator.

Important Instructions

1. Answer all questions. All questions carry equal marks
2. The candidate should indicate the correct roll number on the answer-sheet, otherwise the answer-sheet will not be evaluated and the candidate will be solely responsible for it.
3. This booklet contains 100 questions. Each question has four (4) alternative answers. Bubble indicating the correct answer shall be filled up in the answer-sheet using black/blue ball point pen only. If more than one answer are marked, it shall be treated wrong answer and it will not be evaluated.
4. Do not write anything on the cover page of the test booklet except Roll No.
5. There will not be any penalty for wrong answers.

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1. Which of the following is not a rational number?

- (A) $\sqrt{2}$ (B) $\sqrt{4}$
(C) $\sqrt{9}$ (D) $\sqrt{16}$

2. $\frac{961}{625}$ is a

- (A) terminating decimal (B) non-terminating decimal
(C) cannot be determined (d) none of these

3. The sum of rational and irrational number is always

- (A) rational (B) irrational
(C) both (D) can't say

4. The value of a if $f(x) = \frac{1}{x} + ax$ and $f\left(\frac{1}{5}\right) = \frac{28}{5}$

- (A) 3 (B) 2
(C) 1 (D) 0

5. The value of $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{99 \times 100}$ is

- (A) less than $\frac{99}{100}$ (B) equal to $\frac{99}{100}$
(C) greater than $\frac{100}{99}$ (D) equal to $\frac{100}{9}$

6. If $a + \frac{1}{a} = 15$, then $a^2 + \frac{1}{a^2}$ is equal to

- (A) 223 (B) 210
(C) 225 (D) $225 + \frac{1}{225}$

7. Factors of $y^3 + y^2 + y + 1$

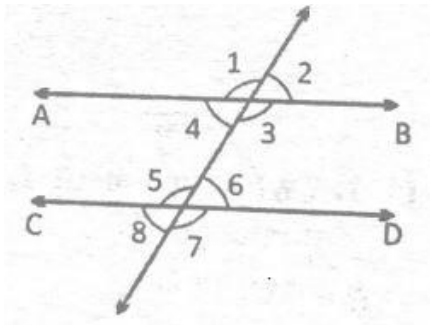
- (A) $(y + 1)(y^2 - 1)$ (B) $(y - 1)(y^2 + 1)$
(C) $(y - 1)(y^2 - 1)$ (D) $(y + 1)(y^2 + 1)$

8. Degree of a cubic polynomial is

- (A) 2 (B) 0
(C) 1 (D) 3

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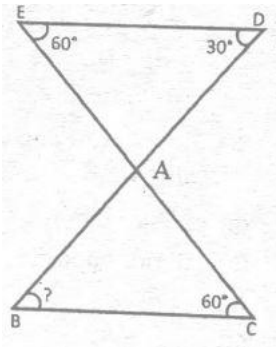
9. The point $(-5, -4)$ belongs to quadrant
- (A) 1st (B) 2nd
(C) 3rd (D) 4th
10. Signs of the co-ordinates of a point in the 3rd quadrant are
- (A) $(+, +)$ (B) $(-, +)$
(C) $(+, -)$ (D) $(-, -)$
11. The linear equation $y = 2x + 3$ cuts x -axis at
- (A) $(-\frac{3}{2}, 0)$ (B) $(\frac{3}{2}, 0)$
(C) $(0, -\frac{3}{2})$ (D) $(0, \frac{3}{2})$
12. Point of intersection of the lines $x + y = 1$ and $2x + 2y = 4$ are
- (A) $(1, 1)$ (B) $(2, 2)$
(C) no intersection (D) many points
13. In fig. $AB \parallel CD$, $\angle 1 : \angle 2 = 3 : 2$, then $\angle 6$ is



- (A) 72° (B) 36°
(C) 108° (D) 144°

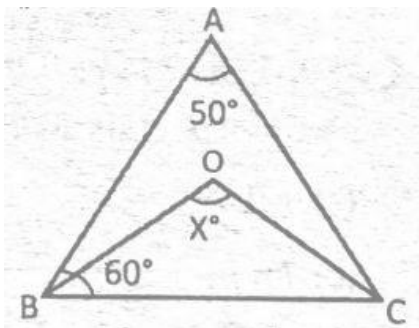
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14. Measure of $\angle ABC$ in given figure.



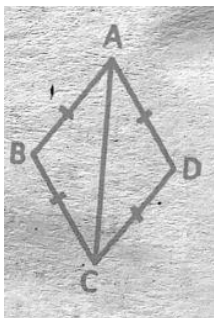
- (A) 90° (B) 30°
 (C) 120° (D) 80°

15. In fig. BO and CO are bisectors of $\angle ACB$ respectively the $x =$



- (A) 115° (B) 110°
 (C) 125° (D) none

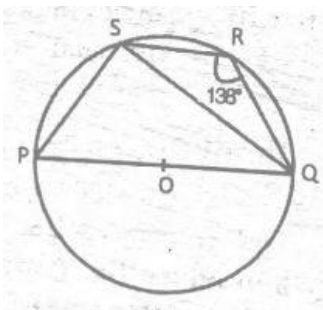
16. In rhombus ABCD, if $AB = AC$ then $\angle BCD =$



- (A) 10 cm (B) 20 cm
 (C) 5 cm (D) none

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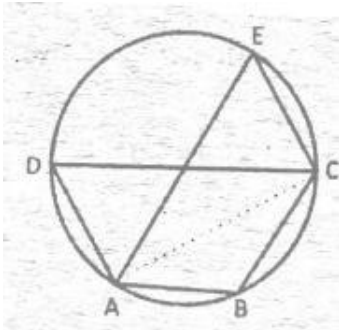
17. In $\triangle ABC$, $DE \parallel BC$ and $AD = DB$, then which of the following is true?
 (A) $AE > EC$ (B) $AE < EC$
 (C) $AE = EC$ (D) $AE \geq EB$
18. A parallelogram which has equal diagonals is a
 (A) square (B) rhombus
 (C) rectangle (D) none
19. Adjacent side of a parallelogram are 5 cm and 3.5 cm. One of its diagonals is 6.5 cm. Then area of $\parallel gm$ is
 (A) $8\sqrt{3} \text{ cm}^2$ (B) $9\sqrt{3} \text{ cm}^2$
 (C) $10\sqrt{3} \text{ cm}^2$ (D) $12\sqrt{3} \text{ cm}^2$
20. The largest volume of a cube that can be enclosed in a sphere of diameter 2 cm is (in cm^3).
 (A) 1 (B) $2\sqrt{2}$
 (C) π (D) $\frac{5}{3\sqrt{3}}$
21. A cylindrical vessel of diameter 4 cm is partly filled with water. 300 lead balls are dropped in it. The rise in water level is 0.8 cm. The diameter of each balls is
 (A) 0.8 cm (B) 0.4 cm
 (C) 0.2 cm (D) none
22. The area of base of cone is 616 sq. cm. Its height is 48 cm. Then its total surface area is.....
 (A) 2816 cm^2 (B) 2861 cm^2
 (C) 2618 cm^2 (D) 2681 cm^2
23. The given fig. POQ is a diameter of a circle with centre O and PQRS is cyclic quadrilateral. SQ is joined. If $\angle R$ is 138° . Find $\angle PQS$.



- (A) 90° (B) 42°
 (C) 48° (D) 38°

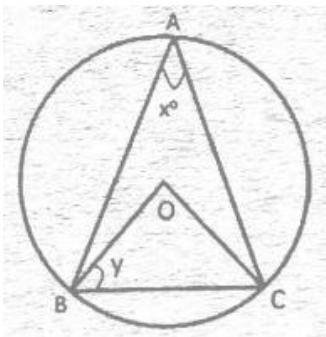
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24. Given a circle and a quadrilateral ABCD inscribed in it as shown. If $\angle B = 125^\circ$, $\angle E$ is equal to



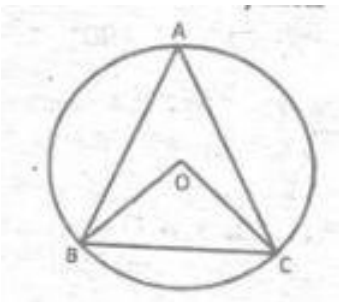
- (A) 55° (B) 125°
(C) 130° (D) 62.5°

25. O is the centre of the circle. BC is a chord of the circle and A is a point on the circle, if $\angle BAC = x$, $\angle OBC = y$. Then $x + y$ is



- (A) $> 90^\circ$ (B) $= 90^\circ$
(C) $< 90^\circ$ (D) $> 180^\circ$

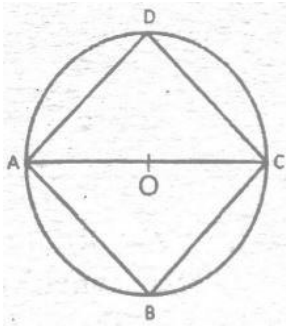
26. As shown in fig., ABC is a triangle inscribed in a circle with centre O. If $\angle OBC = 30^\circ$, then $\angle A =$



- (A) 30° (B) 60°
(C) 45° (D) 75°

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27. In fig. O is centre of circle if $\angle DAC = 54^\circ$ and $\angle ACB = 63^\circ$ then $\angle BAC = \dots\dots\dots$



- (A) 72° (B) 54°
 (C) 27° (D) 90°

28. ABCD is a rhombus with $\angle ABC = 40^\circ$. Then $\angle ACD =$

- (A) 90° (B) 20°
 (C) 40° (D) 70°

29. The class marks of distribution are 26, 31, 36, 41, 46, 51. Then its class width is

- (A) 2.5 (B) 5
 (C) 31 (D) 7.5

30. $OD \perp$ to the chord AB of a circle with centre O. If BC is diameter of a circle and $AC = 2$ cm, then OD is

- (A) 1.5 cm (B) 0.66 cm
 (C) 1 cm (D) 2 cm

31. The value of 'k', if $(x + 3)$ is a factor of $3x^2 + kx + 6$ is 11

- (A) true (B) false
 (C) both (A) and (B) (D) none

32. Rationalizing factor for $\frac{1}{\sqrt{5}-3}$

- (A) $\sqrt{5} - 3$ (B) $3 - \sqrt{5}$
 (C) $\sqrt{5} + 3$ (D) $\sqrt{3} + \sqrt{5}$

33. The greatest among $3\sqrt{4}$, $4\sqrt{5}$, $4\sqrt{3}$ is

- (A) $3\sqrt{4}$ (B) $4\sqrt{5}$
 (C) $4\sqrt{3}$ (D) none of these

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34. One of the factors of $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$ is
- (A) $x - \frac{1}{x}$ (B) $x + \frac{1}{x} - 1$
(C) $x + \frac{1}{x}$ (D) $x^2 + \frac{1}{x^2}$
35. The difference of two complementary angles is 40° than angles are
- (A) $50^\circ, 40^\circ$ (B) $65^\circ, 25^\circ$
(C) $70^\circ, 30^\circ$ (D) $40^\circ, 50^\circ$
36. Supplementary angle of 108.5° is
- (A) 70.5° (B) 71.5°
(C) 71° (D) 72.5°
37. In $\triangle ABC$ $AB = AC$ at AD is $\perp$ to BC . State the property by which $\triangle ADB \cong \triangle ADC$.
- (A) SAS property (B) SSS property
(C) RHS property (D) ASA property
38. One of the diagonals of rhombus is equal to the side of rhombus. The angles of rhombus are
- (A) 60° and 80° (B) 60° and 120°
(C) 120° and 240° (D) 100° and 120°
39. A chord of a circle is 12 cm at its distance from the centre is 8 cm. Find the length of chord of the same circle which is at a distance of 6 cm from the centre.
- (A) 30 cm (B) 24 cm
(C) 16 cm (D) 18 cm
40. The diameter is
- (A) smallest chord of circle (B) greatest chord of circle
(C) 3 times radius of circle (D) none of the above
41. If arithmetic mean of 6, 8, 5, 7, x and 4 is 7 then x is
- (A) 12 (B) 6
(C) 8 (D) 4

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42. Two identical jars are filled with equal numbers of marbles. The marbles are coloured red or white. The ratio of red to white marbles is 7 : 1 in jar I and 9 : 1 in jar II. If there are 90 white marbles all together, how many red marbles are in jar II?
- (A) 360 (B) 450
(C) 560 (D) 720
43. In an election, one candidate received more than 94% (but less than 100%) of the votes cast. What is the least possible number of votes cast?
- (A) 94 (B) 47
(C) 17 (D) 12
44. The cost price of chair is ₹ 350. For how much should it be sold to gain 10%?
- (A) ₹ 300 (B) ₹ 385
(C) ₹ 415 (D) none of these
45. In a throw of a die, the probability of getting a prime number is:
- (A) 2 (B) $\frac{1}{2}$
(C) $\frac{3}{2}$ (D) 6
46. The ratio of the areas of two squares is 4 : 9. The ratio of their perimeters in the same order is :
- (A) 3 : 2 (B) 2 : 3
(C) 9 : 4 (D) 4 : 9
47. $22 - \frac{11}{39} + \frac{5}{26} = \dots\dots\dots$
- (A) $\frac{149}{39}$ (B) $1 + \frac{71}{78}$
(C) $\frac{149}{76}$ (D) $\frac{149}{98}$
48. An angle which measure 180° is called a
- (A) straight angle (B) obtuse angle
(C) right angle (D) complete angle
49. If the median of a triangle are equal, then triangle is
- (A) scalene triangle (B) isosceles triangle
(C) right angle triangle (D) equilateral triangle

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50. The perimeter of a triangular field is 144 m and ratio of the sides is 3 : 4 : 5. Then the area of the field is
- (A) 864 sq. m (B) 764 sq. m
(C) 854 sq. m (D) 754 sq. m
51. In ΔABC , $AB = 6$ cm, $BC = 7$ cm and $AC = 5$ cm. Area of ΔABC is
- (A) $6\sqrt{6}$ cm² (B) $6\sqrt{3}$ cm²
(C) $6\sqrt{2}$ cm² (D) $9\sqrt{6}$ cm²
52. The perimeter of rhombus is 146 cm one of its diagonal is 55 cm. Then the length of other diagonal and area of rhombus is
- (A) 48 cm, 1320 sq. cm (B) 45 cm, 660 sq. cm
(C) 45 cm, 660 sq. cm (D) none
53. The area of a trapezium is 24 cm². The distance between its parallel sides is 4 cm. If one of parallel sides is 7 cm, the other parallel side is
- (A) 5 cm (B) 8 cm
(C) 12 cm (D) 7 cm
54. The edge of a cube is 20 cm. How many small cubes of 5 cm edge can be formed from this cube?
- (A) 4 (B) 32
(C) 64 (D) 100
55. A right circular cone with diameter 8 cm and slant height 8 cm, its volume is
- (A) 14 cm² (B) 18 cm²
(C) 16 cm² (D) 115.8 cm²
56. The dimensions of a hall are 40 m, 25 m and 20 m. If each person requires 200 m³ then the number of persons who can be accommodated in the hall are
- (A) 120 (B) 150
(C) 140 (D) 100
57. 20 years ago, when my parents got married, their average age was 23 years. Now the average age of my family consisting of myself and my parents only is 35 years. My present age is
- (A) 34 years (B) 42 years
(C) 24 years (D) 16 years

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58. The mean of 10, 12, 16, 20, x and 26 is 17 then the value of x is

(A) 18 (B) 28

(C) 32 (D) 36

59. If a coin is tossed twice, the probability of getting at least one head is

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$

(C) $\frac{3}{4}$ (D) none

60. At 6 O'clock the angle formed between hands of clock is

(A) straight line (B) right angle

(C) acute angle (D) obtuse angle

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61. What is the smallest constituent of a matter that retains its chemical identity ?
- (A) Atom (B) Molecule
(C) Ion (D) Radical
62. When a bus starts suddenly, the passengers are pushed back. This is an example of which of the following?
- (A) Newton's first law (B) Newton's second law
(C) Newton's third law (D) None of Newton's laws
63. A particle has a value of 46.0 m s^{-1} . What can it be?
- (A) Force of the particle. (B) Velocity of the particle.
(C) Acceleration of the particle. (D) Momentum of the particle.
64. A healthy person is one who is free from
- (A) diseases (B) work
(C) friends (D) enemies
65. Which of the following substances can be compressed?
- (A) Sponge (B) Stone
(C) Magnet (D) Diamond
66. Which part of the cell contains genetic information?
- (A) Cell (B) Nucleus
(C) Chloroplast (D) Mitochondria
67. Identify the tissue that transports water to the plant body.
- (A) Xylem (B) Phloem
(C) Cambium (D) all of these
68. Growing two or more crops at a time in a field is called
- (A) Crop rotation. (B) Inter cropping.
(C) Mixed cropping. (D) None of these.

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69. In which part of the ear are sound waves amplified?

- (A) Cochlea
- (B) Middle ear
- (C) Outer ear
- (D) Inner ear

70. How is Brownian motion caused?

- (A) Due to temperature fluctuations within the liquid phase.
- (B) Due to attractions and repulsions between the charges on the colloidal particles.
- (C) Due to impact of molecules of the dispersion medium on the colloidal particles.
- (D) Due to pressure variations within the liquid phase

71. Which of the following has a direct effect on the K.E. of particles?

- (A) Pressure
- (B) Potential energy
- (C) Temperature
- (D) All of the above

72. Calculate the weight of 0.885 moles of $\text{Mg}(\text{NO}_3)_2$.

- (A) 13.1 g
- (B) 131 g
- (C) 130 g
- (D) 88.5 g

73. Which of the following microorganisms causes peptic ulcers?

- (A) Staphylococcus aureus
- (B) Streptococcus pneumonia
- (C) Helicobacter pylori
- (D) Nisseria

74. Calculate the temperature at which both the Celsius and Fahrenheit scales show the same reading?

- (A) 40 K
- (B) 100 °F
- (C) - 40 °C
- (D) -100 °C

75. Natural disasters that can affect habitats in the environment are

- (A) droughts.
- (B) floods
- (C) thinning of ozone.
- (D) All of these

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76. What should be the angle between the force and displacement for maximum work?
- (A) 0° (B) 30°
(C) 60° (D) 90°
77. In which of the three media does sound travel the fastest?
- (A) Air (B) Water
(C) Steel (D) Same in all media
78. What is valency?
- (A) The combining capacity of an element (B) The atomicity of an element
(C) The oxidation number of an element (D) All of the above
79. Which of the following is a communicable disease?
- (A) Diabetes (B) Marasmus
(C) Diphtheria (D) Kwashiorkor
80. Crop rotation is an important part of organic farming. Why is monocropping problematic?
- (A) The crop is vulnerable to organized crop thieves.
(B) It encourages the buildup of diseases and pests that destroy that particular crop.
(C) It does not use minerals.
(D) It is expensive.
81. What is a solution of iodine in carbon tetrachloride called?
- (A) Aqueous solution (B) Alcoholic solution
(C) Non-aqueous solution (D) Tincture of iodine
82. Which of the following synthesises protein?
- (A) Golgi complex (B) Ribosomes
(C) Secretory vesicle (D) None of these
83. In a 100 m race between Ramesh and Suresh, Ramesh wins the race. Assuming they run with uniform acceleration. Which of the following is correct?
- (A) Acceleration of Suresh is more than Ramesh
(B) Acceleration of Ramesh is more than Suresh
(C) Both Suresh and Ramesh have equal acceleration
(D) Both Suresh and Ramesh have equal average velocities

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84. Which of the following is not an organic method used to control weeds?
- (A) Proper seed beds (B) Weedicides
(C) Intercropping (D) Crop rotation
85. Which of these cell organelles have double membranes ?
- (A) Mitochondria (B) Chloroplast
(C) Nucleus (D) All of these
86. Which of the following conclusions cannot be drawn on the basis of Rutherford's atomic model?
- (A) Total mass of the atom is concentrated at the centre of atom.
(B) Nucleus is located inside the atom containing positively charged particles.
(C) Most of the atom is empty in space.
(D) Electrons revolve around the nucleus in stationary circular orbits.
87. Which metal is NOT a solid at room temperature?
- (A) Iron (B) Aluminium
(C) Mercury (D) Steel
88. Which of the following electronic configurations represents a noble gas?
- (A) 2, 8, 2 (B) 2, 8, 6
(C) 2, 8 (D) 2, 8, 8, 2
89. By applying a force of 1 N, approximately what mass of a body can a person hold?
- (A) 100 mg (B) 100 g
(C) 1 kg (D) 10 kg
90. A rocket on a launch pad demonstrates which Law of Newton?
- (A) First law of motion (B) Second law of motion
(C) Third law of motion (D) Universal law of gravitation
91. What happens when ice is converted into water ?
- (A) Heat is absorbed. (B) Heat is released.
(C) Temperature increases. (D) Temperature decreases.

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92. A book is lying on a table. What is the angle between the book on the table and the weight of the book?
- (A) 0° (B) 45°
(C) 90° (D) 180°
93. Kinetic energy is a product of mass and velocity whereas potential energy is a product of
- (A) heat and mass (B) weight and height
(C) weight and volume (D) heat and height
94. Which of the following is/are connective tissues?
- (A) Bone (B) Cartilage
(C) Blood (D) All of the above
95. Which of the following is water borne disease?
- (A) Malaria (B) Cholera
(C) Tuberculosis (D) Both (A) and (B)
96. A simple pendulum hangs from the roof of train. The string is inclined towards the rear of the train. What is the nature of motion of the train?
- (A) uniform (B) acceleration
(C) retarded (D) at rest
97. What does the odometer of an automobile measure
- (A) displacement (B) speed
(C) distance (D) none
98. Force required to produce an acceleration of 2m/sec^2 in a body of mass 10 kg is
- (A) 2 N (B) 1.5 N
(C) 10 N (D) 20 N
99. A car accelerates on a horizontal road due to the force exerted by
- (A) engine of the car (B) the driver of car
(C) earth (D) road
100. A spring is compressed. The potential energy of the spring
- (A) remain unchanged (B) increases
(C) decreases (D) becomes zero