CLASS-XITH

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 | | | | |

- 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.

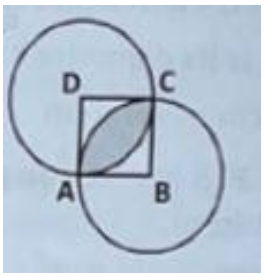
PRATAPGARH TALENT SEARCH EXAMINATION-2022

1. If H.C.F. (p, q) = 12 and p × q = 1800, find L.C.M (p, q).

   (A) 3600 (B) 900

   (C) 150 (D) 90

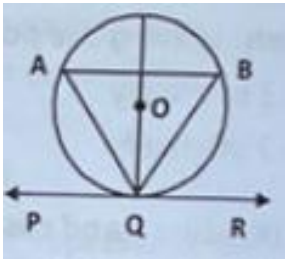
2. ABCD is a square of side 1 unit and B, D are centre of two circles of radius 1 unit, Find the area of shaded portion.



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

   (C) $\frac{\pi}{4}-\frac{1}{2}$ (D) $\frac{\pi}{2}-1$

3. In the figure, AB is a chord parallel to PR and $\angle BQR = 70°$, find the measure of $\angle AQB$.



   (A) 70° (B) 30°

   (C) 35° (D) 40°

4. If $\sin(90-\theta)+\cos\theta=\sqrt{2}\cos(90-\theta)$, for $0<\theta<90°$, find the value of cosec θ.

   (A) $\frac{\sqrt{3}}{2}$ (B) $\frac{2}{\sqrt{3}}$

   (C) $\sqrt{\frac{3}{2}}$ (D) $\sqrt{\frac{2}{3}}$

5. If the median of $\frac{x}{3},\frac{x}{2},\frac{x}{4},\frac{2x}{9},x$ and x is 5, find the value of $'x'$.

   (A) 10 (B) 15

   (C) 20 (D) 25

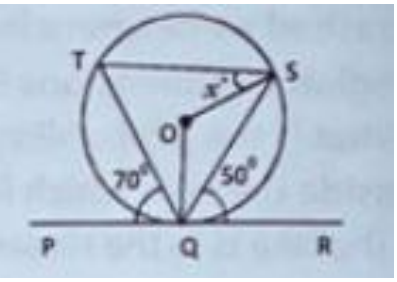
PRATAPGARH TALENT SEARCH EXAMINATION-2022

6. Which option will have a terminating decimal expansion ?

   (A) $\frac{77}{210}$ (B) $\frac{23}{30}$

   (C) $\frac{125}{441}$ (D) $\frac{23}{8}$

7. In the given figure, find the value of "x".



   (A) 25° (B) 30°

   (C) 35° (D) 40°

8. If α, β and γ are the zeroes of the cubic polynomial $3x^3 - 5x^2 - 11x - 3$, find $\alpha + \beta + \gamma$.

   (A) $\frac{5}{3}$ (B) $\frac{-11}{3}$

   (C) 1 (D) $\frac{-5}{3}$

9. If $x = 0.\overline{7}$, what is the value of 2x ?

   (A) $1.\overline{4}$ (B) $1.\overline{5}$

   (C) $1.\overline{54}$ (D) $1.\overline{45}$

10. Which shape has the vertices (3, 2), (0, 5), (-3, 2) and (0, -1) ?

    (A) Rectangle (B) Square

    (C) Trapezium (D) Rhombus

11. Given $P = 3 + 5 + 7 +$ .... (n terms) and $Q = 5 + 8 + 11 +$ .... (10 terms). What is the value of 'n' if $\frac{P}{Q} = 7$?

    (A) 25 (B) 35

    (C) 30 (D) 20

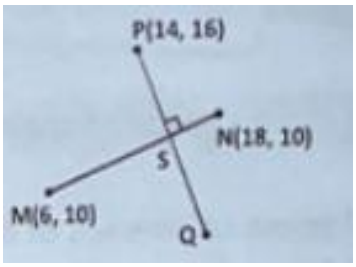
12. Find the value of $\cos^2 \frac{3\pi}{5} + \cos^2 \frac{4\pi}{5}$.

    (A) $\frac{4}{5}$ (B) $\frac{5}{2}$

    (C) $\frac{5}{4}$ (D) $\frac{3}{4}$

PRATAPGARH TALENT SEARCH EXAMINATION-2022

13. Given that MSN is a straight line and S is the mid-point of PQ, find the coordinates of Q.



(A) (12, 14) (B) (14, 10)

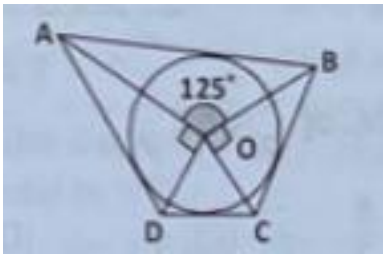
(C) (14, 4) (D) (10, 4)

14. A card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a club card ?

(A) $\frac{1}{2}$ (B) $\frac{3}{4}$

(C) $\frac{1}{4}$ (D) 1

15. In the given figure, if $\angle AOB = 125°$ find the measure of $\angle COD$.



(A) 62.5° (B) 45°

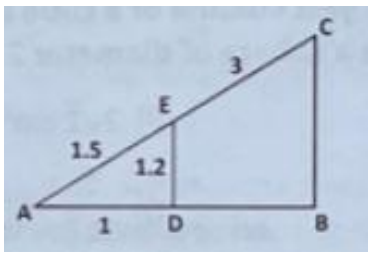
(C) 35° (D) 55°

16. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, find $\cos\theta - \sin\theta$.

(A) $\sqrt{2}\tan\theta$ (B) $\sqrt{2}\sin\theta$

(C) $\frac{\sqrt{2}}{\cos\theta + \sin\theta}$ (D) $2\sec\theta$

17. In the given figure if $\Delta ADE \sim \Delta ABC$, find the measure of BC.



(A) 4.5 (B) 3

(C) 3.6 (D) 2.4

18. Find the largest volume of a cube that can be enclosed in a sphere of diameter 2 cm.

(A) 1 cm^3 (B) $2\sqrt{2}$ cm^3

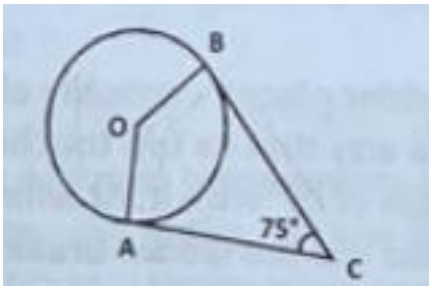
(C) π cm^3 (D) $\frac{8}{3\sqrt{3}}cm^3$

19. What is the ratio in which P (2, 5) divides the line joining the points (8, 2) and (-6, 9) ?

(A) 3 : 4 (B) 1 : 3

(C) 4 : 3 (D) 1 : 4

20. In the given figure, identify $\angle AOB$.



(A) 75° (B) 85°

(C) 95° (D) 105°

21. Identify one of the roots of the quadratic equation $25x(x+1) = -4$.

(A) -1 (B) $-\frac{5}{4}$

(C) $-\frac{1}{5}$ (D) $-\frac{4}{3}$

22. If there are 3 A.M's between 4 and 84, find their sum.

(A) 88 (B) 132

(C) 166 (D) 336

23. If $\sin\theta + \cos\theta = \sqrt{2}$, find the value of $\sin\theta.\cos\theta$.

(A) 2 (B) $\sqrt{2} - 1$

(C) $\frac{1}{2}$ (D) $2\sec\theta$

24. Find the image of $(-4, -8)$ with respect to the Y-axis.

(A) (4, 8) (B) (4, -8)

(C) (-8, -4) (D) (-4, -8)

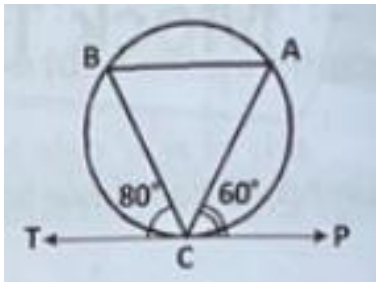
PRATAPGARH TALENT SEARCH EXAMINATION-2022

25. If 18, A, B, -3 are in arithmetic sequence, find the values of A and B.

(A) 12, 6 (B) 13, 8

(C) 11, 4 (D) 10, 2

26. Find the angle subtended by AB at the centre of the circle.



(A) 90° (B) 96°

(C) 108° (D) 120°

27. There are 45 boys and girls in a class. Given the probability that a boy is chosen is $\frac{4}{15}$. Find the number of girls.

(A) 8 (B) 12

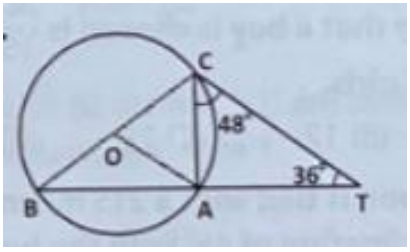
(C) 25 (D) 33

28. What is the maximum distance between any two points of a cube of side 'l' units ?

(A) $\left(\sqrt{2}+1\right) l$ units (B) $\sqrt{2}\, l$ units

(C) $\sqrt{3}\, l$ units (D) $2\, l$ units

29. In the figure, find ∠ABC.



(A) 60° (B) 120°

(C) 180° (D) 90°

30. Two numbers are chosen from 1 to 5. Find the probability for the two numbers to be consecutive.

(A) $\frac{1}{5}$ (B) $\frac{2}{5}$

(C) $\frac{1}{10}$ (D) $\frac{2}{10}$

PRATAPGARH TALENT SEARCH EXAMINATION-2022

31. If the sum of mode and mean of a certain data is 129 and its median is 63, what is its mode ?

(A) 69 (B) 63

(C) 60 (D) 65

32. If $4^{x+y} = 1$ and $4^{x-y} = 4$, find the values of x & y respectively.

(A) $\frac{1}{2}, -\frac{1}{2}$ (B) $\frac{1}{2}, \frac{1}{2}$

(C) $-\frac{1}{2}, -\frac{1}{2}$ (D) $-\frac{1}{2}, \frac{1}{2}$

33. If $\sqrt{3}\tan\theta = 3\sin\theta$, find the value of $\sin^2\theta - \cos^2\theta$.

(A) $\frac{\sqrt{2}}{\sqrt{3}}$ (B) $\frac{1}{3}$

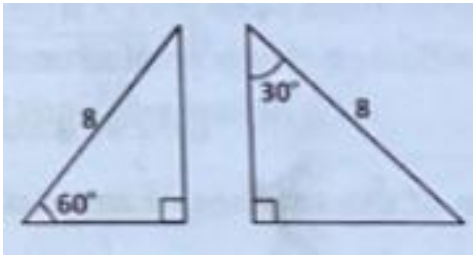
(C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{3}}$

34. How many 2-digit numbers are divisible by 4 ?

(A) 20 (B) 16

(C) 25 (D) 22

35. Which statement best describes the given triangles ?



(A) Both are similar and congruent (B) Both are similar but not congruent

(C) Both are congruent but not similar (D) Both are neither similar nor congruent

36. Which option is equal to $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}$?

(A) $\frac{2}{\sin\theta}$ (B) $\frac{4}{\sin\theta\cos\theta}$

(C) 2 (D) $2\sin\theta.\cos\theta$

37. Which of the following is a correct statement ?

(A) π is a natural number (B) π is an irrational number

(C) π is not defined (D) The value of π is $\frac{22}{7}$

38. From a well shuffled pack of cards, one card is drawn at random. What is the probability that the card drawn is a king ?

(A) $\frac{12}{13}$ (B) $\frac{1}{13}$

(C) $\frac{3}{13}$ (D) $\frac{1}{2}$

39. In an arithmetic progression, if $t_p = q,\ t_q = p,$ find t_{pq}.

(A) $p + q - pq$ (B) $p + q$

(C) $p - q + pq$ (D) $pq - p - q$

40. Find the value of 'p' so that $x^2 + 5px + 16 = 0$ has no real root.

(A) Greater than $\frac{8}{5}$ (B) Less than $\frac{-8}{5}$

(C) Lies between $\frac{-8}{5}$ & $\frac{8}{5}$ (D) Less than $\frac{15}{8}$

41. Let $n = 1^2 + 1^4 + 1^6 + 1^8 + \ldots + 1^{50}$. What is the value of n ?

(A) 10 (B) 20

(C) 25 (D) 30

42. Veronica has a bank account that earns m% interest compounded annually. If she opened the account with \$200, the expression $\$200(x)^t$ represents the amount in the account after t years. Which of the following gives x in terms of m ?

(A) $1 + 0.1m$ (B) $1 + m$

(C) $1 - m$ (D) $1 + 100m$

43. If the initial population of pandas was 100 and grew to 125 after the first year, which of the following functions best models the population of pandas P with respect to the number of years t if the population growth of pandas is considered to be linear?

(A) $P = 25t + 100$ (B) $P = 100(1.25)^t$

(C) $P = 100(1.25)^t$ (D) $P = 20t^2 + 5t + 100$

44. Julie has a square fence that encloses her garden. She decides to expand her garden by making each side of the fence 10 percent longer. After this expansion, the area of Julie's garden will have increased by what percent?

(A) 20% (B) 21%

(C) 22% (D) 25%

45. If $a > 0$, then $\frac{1}{a} + \frac{3}{4}$ is equivalent to which of the following?

(A) $\frac{3+4a}{4a}$ (B) $\frac{4+3a}{4a}$

(C) $\frac{7}{4a}$ (D) $\frac{4}{a+4}$

46. If $3x - 8 = -23$, what is the value of $6x - 7$?

(A) -5 (B) -21

(C) -30 (D) -37

47. If $\frac{1}{x} + \frac{1}{y} = \frac{1}{p}$, what is x in terms of p *and* y ?

(A) $p - y$ (B) $\frac{py}{p+y}$

(C) $\frac{py}{p-y}$ (D) $\frac{py}{y-p}$

48. What is the solution (*x*, *y*) to the system of the equations below?

$y + 2x = 20$

$6x - 5y = 12$

(A) $(-7, 6)$ (B) $(-6, 7)$

(C) $(6, 7)$ (D) $(7, 6)$

49. If $\frac{3}{4}x - 4 > \frac{1}{2}x - 10$, which of the following must be true?

(A) $x < 24$ (B) $x > 24$

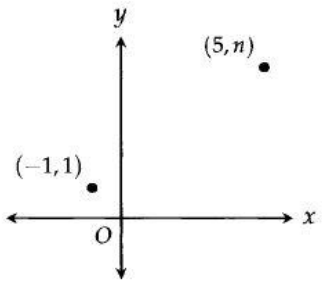
(C) $x < -24$ (D) $x > -24$

50. If 3 is subtracted from 3 times the number *x*, the result is 21. What is the result when 8 is added to half of *x* ?

(A) 1 (B) 5

(C) 8 (D) 12

51. In the given figure (not drawn to scale), the slope of the line through the two plotted points is $\frac{1}{3}$. What is the value of *n* ?



(A) 9 (B) 4

(C) 3 (D) $\frac{7}{3}$

52. The number of loaves of bread *b* remaining in a bakery each day can be estimated by the equation $b = 200 - 18h$, where *h* is the number of hours that have passed since the store's opening. What is the meaning of the value 18 in this equation ?

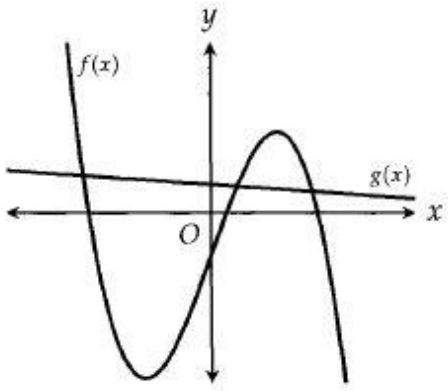
(A) The bakery sells all its loaves of bread in 18 hours.

(B) The bakery sells 18 loaves of bread each hour.

(C) The bakery sells a total of 18 loaves of bread each day.

(D) There are 18 loaves of bread left in the bakery at the end of each day.

53. In the portion of *xy*-plane shown below, how many values values of *x* does $f(x) = g(x)$?



(A) None (B) One

(C) Two (D) Three

54. What are the solutions to $x^2 + 4x + 2 = 0$?

(A) $x = -2 \pm \sqrt{2}$ (B) $x = 2 \pm 2\sqrt{2}$

(C) $x = -2 \pm 2\sqrt{2}$ (D) $x = -4 \pm 2\sqrt{2}$

55. Given that $i = \sqrt{-1}$, which of the following is equal to $i\,(i + 1)$?

(A) $i - 2$ (B) $i - 1$

(C) $i + 1$ (D) 0

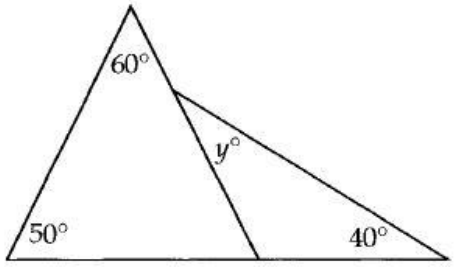
56. Which of the following expressions is equal to -5 for some value of *x* ?

(A) $|x - 6| + 2$ (B) $|x - 2| - 6$

(C) $|x + 2| + 6$ (D) $|x + 6| - 2$

PRATAPGARH TALENT SEARCH EXAMINATION-2022

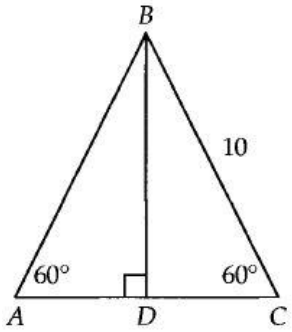
57. In the given figure (not drawn to scale), what is the value of y?



(A) 30 (B) 40

(C) 50 (D) 70

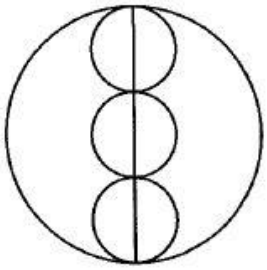
58. In the given figure ΔBDC, what is the length of $\overline{DC}$?



(A) 3 (B) 5

(C) $5\sqrt{3}$ (D) 8

59. In the given figure, three congruent circles are tangent to each other and have centers that lie on the diameter of a larger circle. If the area of each of these small circles is 9π, what is the area of the large circle?



(A) 36π (B) 49π

(C) 64π (D) 81π

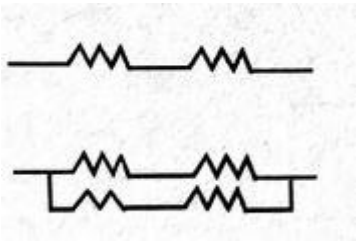
60. Kristie has taken five tests in science class. The average of all five of Kristie's test scores is 94. The average of her last three test scores is 92. What is the average of her first two test scores?

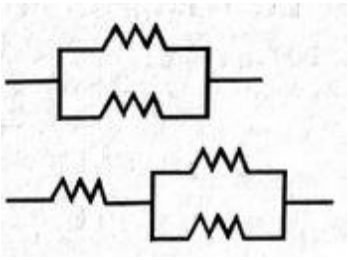
(A) 95 (B) 96

(C) 97 (D) 98

PRATAPGARH TALENT SEARCH EXAMINATION-2022

61. All the resistors shown below have the same resistance of 5 Ω. Which arrangement has an effective resistance of 5 Ω ?

(A) 

(B) 

(C)

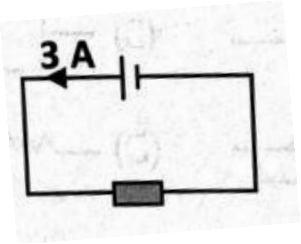
(D)

62. Identify the plant hormone.

(A) Insulin (B) Thyroxine

(C) Estrogen (D) Cytokinin

63. How much charge flows through the resistor in 4 s?



(A) 3 C (B) 6 C

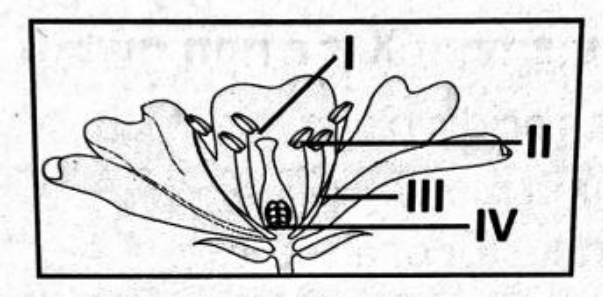
(C) 12 C (D) 18 C

64. Which equipment works on the principle of electromagnetic induction ?

(A) Electric fan (B) MP3 player

(C) Generator (D) Refrigerator

65. In the figure given below, where do germination of pollen grain and fertilization of male nucleus take place?



(A) I and II only (B) I and III only

(C) I and IV only (D) I, II and III only

66. If the refractive index of diamond is 2.42, then the speed of light when passing through diamond

(A) increases by 41% (B) decreases by 41%

(C) increases by 59% (D) decreases by 59%

67. What is the colour of zinc sulphate solution?

(A) Green (B) Yellow

(C) Blue (D) Colourless

68. Which of the statements about the reaction,
$ZnO + CO \rightarrow Zn + CO_2$, is correct?

(A) ZnO is being oxidised (B) CO is being reduced

(C) CO_2, is being oxidised (D) ZnO is being reduced

69. What is the potential difference between the live wire and the neutral wire in domestic circuits?

(A) 110 V (B) 210 V

(C) 220 V (D) 160 V

70. The blind spot on the retina has

(A) numerous nerve endings (B) no nerve endings

(C) few nerve endings (D) nerve endings which increase in number as age advances

71. An electric heater of resistance 200 Ω draws a current of 1A. Calculate its power.

(A) 100 W (B) 200 W

(C) 300 W (D) 200 V

72. What happens to the air as it passes through the nasal cavity?

(A) Filtered in the nostrils (B) Moistened by mucus

(C) Warmed to the body temperature (D) All of these

73. Identify the weakest acid from the following.

(A) H_2SO_4 (B) HNO_3

(C) H_2SO_3 (D) HCl

74. Which of the following is an allotrope of carbon?

(A) C_{12} (B) C_{14}

(C) C_{60} (D) C_{72}

PRATAPGARH TALENT SEARCH EXAMINATION-2022

75. Where does fertilisation take place in plants?

(A) Stigma (B) Ovary

(C) Stamen (D) Anther

76. The ozone layer is destroyed due to

(A) CFC (B) CO_2

(C) SO_2 (D) NH_3

77. Which statement is incorrect on biomass ?

(A) It is a plant residue. (B) It is used to produce biogas.

(C) It is a renewable source of energy. (D) It is used to produce liquid petroleum gas.

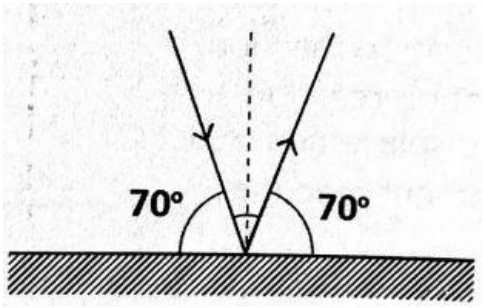
78. Identify the type of reaction illustrated below.

$H_2 + Cl_2 \rightarrow 2HCl$

(A) Decomposition reaction (B) Combination reaction

(C) Double displacement reaction (D) Displacement reaction

79. Observe the given figure.



What is the angle of reflection?

(A) 20° (B) 40°

(C) 70° (D) 90°

80. What is a natural optical instrument?

(A) A magnifying glass (B) An eye

(C) A piece of glass (D) A plane mirror

81. Which type of ores are subjected to roasting?

(A) Oxide ores (B) Silicate ores

(C) Sulphide ores (D) Carbonate ores

82. Which bulb has the lowest resistance?

(A) 25 W (B) 50 W

(C) 60 W (D) 40 W

83. An iron box has a resistance coil of 30 Ω and takes a current of 10 A. The heat produced by it in one minute is

(A) 180 kJ (B) 90 kJ

(C) 45 kJ (D) 135 kJ

84. Which of the following represent(s) nitrogen fixation?

(A) Nitrogen → Ammonia (B) Nitrogen → Nitrates

(C) Nitrogen → Amino acid (D) Both (A) and (B)

85. Where does the fertilization of the female egg usually occur in human beings?

(A) Vagina (B) Uterus

(C) Ovary (D) Fallopian tube

86. Two cars 'A' and 'B' of same mass start from the same location at the same time but on different straight roads. Car 'A' travels on a road that has greater angle of inclination with horizontal compared to the road on which 'B' travels. At any instant both cars 'A' and 'B' have the same height above the starting point. If E_A and E_B are total energies of cars 'A' and 'B' respectively, then

(A) $E_A < E_B$ (B) $E_A = E_B$

(C) $E_A > E_B$ (D) Relation between E_A and E_B cannot be decided based on given information

87. The gravitational potential energy difference per unit mass between the surface of a planet and a point 100 m above it is 1000 J/kg. How much work is required to be done in moving a 5 kg object 100 m on a slope at 30° to the horizontal on this planet?

(A) 1250 J (B) 2500 J

(C) 4350 J (D) 5000 J

88. You are provided with 18 g each of O_2, N_2, CH_4 and H_2O. Which of the following is the correct decreasing order of number of atoms present in these samples?

(A) $CH_4 > H_2O > N_2 > O_2$ (B) $O_2 > N_2 > H_2O > CH_4$

(C) $CH_4 > N_2 > O_2 > H_2O$ (D) $N_2 > H_2O > O_2 > CH_4$

89. Stainless steel alloy is a mixture of

(A) $Fe + C + Cr + Ni$ (B) $Ni + C + Cr + Al$

(C) $Fe + Cu + Al + C$ (D) $Fe + Zn + C + Ni$

90. A metal on heating in presence of air gives compound which is soluble in water and have high melting point. The metal is

(A) calcium (B) carbon

(C) silicon (D) iron

91. Metalloid among the following is

(A) lithium (B) sulphur

(C) sodium (D) silicon

92. Most reactive metal is

(A) Na (B) Mg

(C) Cu (D) Au

93. The product of fermentation is

(A) Formic acid (B) Ethanol

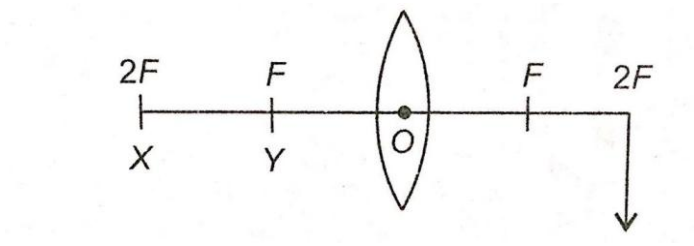
(C) Methanol (D) Citric acid

94. Ovaries perform the function of

(A) Progesterone secretion (B) Estrogen secretion

(C) Ovum formation (D) All of these

95. To produce an image by a convex lens, at the position shown (see figure) the object is needed to be placed



(A) Between Y and O (B) At Y

(C) Between X and Y (D) At X

96. Which of the following statements is incorrect?

(A) In primary rainbow, red colour is formed on the top and violet colour on the bottom.

(B) A normal human eye cannot clearly see all the object at the different distances.

(C) A beam of white light gives a spectrum on passing through a hollow prism.

(D) Aqueous humor maintains the shape of the front part of the eye.

97. An old person is unable to see clearly nearby objects as well as distant object. To correct the vision, what kind of lens will he require?

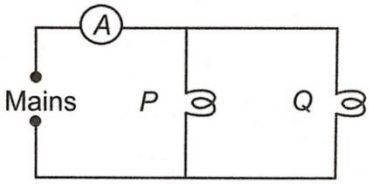
(A) Concave lens

(B) Bifocal lens whose upper portion is concave lens and lower portion is convex lens.

(C) Convex lens

(D) Bifocal lens whose upper portion is convex lens and lower portion is concave lens.

98. How will be the reading in the ammeter A affected if another identical bulb Q is connected in parallel to P? (The voltage in the mains is maintained at a constant value.)



(A) The reading will be reduced to one-half.

(B) The reading will not be affected.

(C) The reading will be doubled.

(D) The reading will be increased four-fold.

99. In a row of 24 boys, when Akash was shifted by 4 places towards left, he became 8th from the left end. What was his earlier position from the right end of the row?

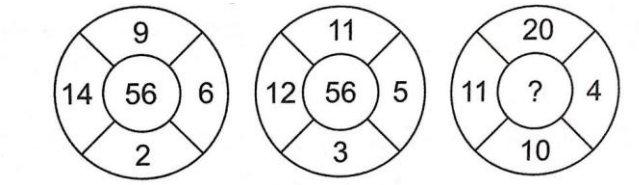
(A) 12th

(B) 13th

(C) 14th

(D) 15th

100. Find the missing term, if same rule is followed in all the three figures.



(A) 210

(B) 450

(C) 70

(D) 150