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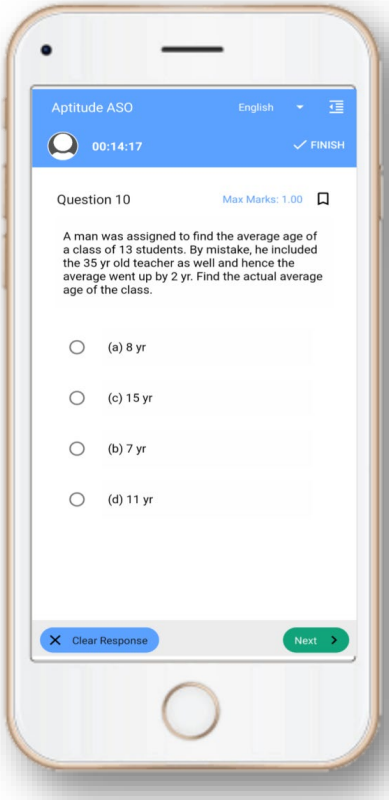

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T. B. C. : AS – 2

Test Booklet Series

Serial No. 05189

A

TEST BOOKLET

SPECIAL RECRUITMENT OF A. S. O.

MATHEMATICS

Time Allowed : 1 Hour

Maximum Marks : 100

: INSTRUCTIONS TO CANDIDATES :

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET OF THE SAME SERIES ISSUED TO YOU.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C** OR **D**, AS THE CASE MAY BE, IN THE APPROPRIATE PLACES IN THE ANSWER SHEET USING BALL POINT PEN (BLUE OR BLACK).
3. You have to enter your **Roll No.** on the Test Booklet in the Box provided alongside. **DO NOT** write *anything else* on the Test Booklet.
4. This Test Booklet contains **50** items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose **ONLY ONE** response (answer) for each item (question).
5. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided, by **using BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
6. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. **There will be no negative marking for wrong answer**.
7. **Before** you proceed to mark (darken) in the Answer Sheet the responses to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions in your **Admission Certificate**.
8. After you have completed filling in all your responses (answers) on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *Answer Sheet* issued to you. You are allowed to take with you the candidate's copy/second page of the Answer Sheet along with the *Test Booklet* after completion of the examination for your reference.

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1. For any two positive integers r and s, HCF(r, s) × LCM(r, s) =
   (A) r × s
   (B) r × r – s
   (C) r + s × s
   (D) None of the above

2. $5 - \sqrt{3}$ is :
   (A) Rational
   (B) Irrational
   (C) Rational and irrational both
   (D) None of the above

3. Let p be a prime number. If p divides m^2, where m is a positive integer then :
   (A) p does not divide m
   (B) mp is always an even number
   (C) p divides m
   (D) None of the above

4. $8\sqrt{15} \div 2\sqrt{3}$ =
   (A) $3\sqrt{5}$
   (B) $4\sqrt{5}$
   (C) $4\sqrt{3}$
   (D) $4\sqrt{15}$

5. The value of 4725-2879 by rounding each number to the nearest hundred is
   (A) 1900
   (B) 1846
   (C) 1800
   (D) None of the above

6. Raj completes $\frac{1}{6}$ of his project in $3\frac{1}{2}$ days. How long would he take to complete the whole project ?
   (A) 21 days
   (B) 7/12 days
   (C) 7/3 days
   (D) 18 days

7. If the HCF of 210 and 55 is expressible in the form 210 × 5 + 55y then y =
   (A) 19
   (B) 5
   (C) 55
   (D) – 19

8. In a school there are two sections — Section G and Section H of class X. There are 90 students in Section G and 144 students in section H. Determine the minimum number of books required for their class library so that they can be distributed equally among the students of Section G or Section H.
   (A) 18
   (B) 720
   (C) 90
   (D) 144

9. The product of two 2 digit numbers is 1938. If the product of their unit's digits is 28 and that of ten's digits is 15, then find the numbers :

(A) 37, 54

(B) 36, 54

(C) 19, 38

(D) 34, 57

10. 280% of a number is 560. What is the number ?

(A) 200

(B) 280

(C) 1568

(D) None of the above

11. How many two digit numbers are divisible by 3 ?

(A) 30

(B) 20

(C) 40

(D) None of the above

12. $1 + 2 + 3 + \ldots\ldots\ldots + 20 =$

(A) 190

(B) 210

(C) 400

(D) None of the above

13. If the sum of first 14 terms of an Arithmetic Progression is 1050 and its first term is 10 then the 20^{th} term is :

(A) 200

(B) 100

(C) 1050

(D) None of the above

14. Whether 301 is a term in the list of numbers 5, 11, 17, 23, ...

(A) Yes

(B) Yes if we have total number of terms as 51

(C) No

(D) None of the above

15. A quadratic equation $ax^2 + bx + c = 0$ has no real root if :

(A) $b^2 - 4ac > 0$

(B) $b^2 - 4ac = 0$

(C) $b - 4ac < 0$

(D) $b^2 - 4ac < 0$

16. A motor boat whose speed is 18 km/h in still water take 1 hour more to go 24 km upstream than to return downstream to the same spot. Then the speed of the stream is :

(A) 8 km/h

(B) 24 km/h

(C) 23 km/h

(D) 6 km/h

17. Roots of the quadratic equation $2x^2 - 2\sqrt{2}x + 1 = 0$ are :

(A) $\left(\frac{1}{\sqrt{2}}, 2\right)$

(B) $\left(\frac{1}{\sqrt{2}}, 3\right)$

(C) $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

(D) None of the above

18. For what values of p does the pair of equations given below has unique solution :

$4x + py + 8 = 0 ; 2x + 2y + 2 = 0$

(A) $p = 4$

(B) $p \neq 8$

(C) For all values of p except 4

(D) None of the above

19. 4 chairs and 3 tables cost Rs. 2100 and 5 chairs and 2 tables cost Rs. 1,750, then the cost of a chair is :

(A) Rs.150

(B) Rs. 500

(C) Rs. 15

(D) None of the above

20. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - px + q$ then $\frac{1}{\alpha} + \frac{1}{\beta} =$

(A) pq

(B) q/p

(C) p/q

(D) None of the above

21. $g(y) = 2y^3 + 5y - 7$ is a :

(A) Cubic polynomial

(B) Quadratic polynomial

(C) Linear polynomial

(D) None of the above

22. The sum of the squares of zeroes of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40 then value of k is :

(A) 14

(B) 3

(C) 8

(D) 12

23. Verify whether 2 and 0 are zeroes of the polynomial $x^2 - 2x$:

(A) Yes

(B) No

(C) Yes if $x^2 = 3$

(D) None of the above

24. The remainder when $x^4 + x^3 - 2x^2 + x + 1$ is divided by $(x - 1)$ is :

(A) 1

(B) 3

(C) 2

(D) 0

25. The value of k, if $(x - 1)$ is a factor of $4x^3 + 3x^2 - 4x + k$ is :

(A) 0

(B) – 1

(C) – 2

(D) – 3

26. A fort had provisions of food for 300 men for 90 days. After 20 days, 50 men left the fort. How long would the food last at the same rate ?

(A) 108 days

(B) 70 days

(C) 84 days

(D) 48 days

27. A and B together can do a piece of work in 12 days. While B alone can finish it in 30 days. In how many days can A alone finish the work ?

(A) 18 days

(B) 20 days

(C) 30 days

(D) 12 days

28. At what rate percent per annum will a sum of Rs. 2,000 amount to Rs. 2,205 in 2 years, compounded annually ?

(A) 6

(B) 20

(C) 2

(D) 5

29. A trader marks his goods at 40% above the cost price and allows a discount of 25%. What is his gain percent ?

(A) 5

(B) 15

(C) 2

(D) 65

30. Area of a regular hexagon each of whose sides measures 6 cm is :

(A) $92.528\ cm^2$

(B) $93.528\ cm^2$

(C) $36\ cm^2$

(D) None of the above

31. The lengths of tangents drawn from an external point to a circle are :

(A) Parallel

(B) Not equal

(C) Equal

(D) None of the above

32. The area of the sector of a circle with radius 4 cm and of angle 30° is (use $\pi = 3.14$) approximately :

(A) $4.19\ cm^2$

(B) $16\ cm^2$

(C) $120\ cm^2$

(D) None of the above

33. Length of an arc of a sector of angle θ for a circle with radius r is :

(A) $\frac{360\theta}{2\pi r}$

(B) $\frac{r\theta}{360\pi}$

(C) $\frac{2\pi r\theta}{360}$

(D) None of the above

34. Two sides of a triangle are 8 cm and 11 cm respectively and its perimeter is 32 cm then the area of the triangle is :

(A) $11\sqrt{2}\ cm^2$

(B) $30\sqrt{2}\ cm^2$

(C) $11\sqrt{30}\ cm^2$

(D) $8\sqrt{30}\ cm^2$

35. If the sum of a pair of opposite angles of a quadrilateral is 180°, then the quadrilateral is :

(A) Asymptote

(B) Cyclic

(C) Cubic

(D) None of the above

36. Surface area of a cuboid whose length, breadth and height are 15 cm, 10 cm and 20 cm respectively is :

(A) $6000\ cm^2$

(B) $1300\ cm^2$

(C) $3000\ cm^2$

(D) None of the above

37. Find the curved surface area of a right circular cone, whose slant height is 10 cm and base radius is 7 cm (take $\pi = 22/7$) :

(A) $22\ cm^2$

(B) $140\ cm^2$

(C) $220\ cm^2$

(D) $70\ cm^2$

38. The height and the slant height of a cone are 21 cm and 28 cm respectively, then the volume of the cone is (take $\pi = 22/7$) :

(A) $154\ cm^3$

(B) $1848\ cm^3$

(C) $84\ cm^3$

(D) $7546\ cm^3$

39. A hemispherical bowl has a radius 3.5 cm. What would be the volume of water it would contain ? (take $\pi = 22/7$) :

(A) $84.8\ cm^3$

(B) $89\ cm^3$

(C) $89.8\ cm^3$

(D) None of the above

40. A cone of height 24 cm and radius of base 6 cm is made up of modeling clay. A child reshapes it in the form of a sphere. Then the radius of the sphere will be :

(A) 2 cm

(B) 4 cm

(C) 12 cm

(D) 6 cm

41. The length of the longest pole that can be put in a room of dimension 10 m by 10 m by 5 m is :

(A) 25 m

(B) 20 m

(C) 500 m

(D) 15 m

42. A cube has total surface area 486 cm^2. Then volume of the cube is :
(A) 829 cm^3
(B) 486 cm^3
(C) 720 cm^3
(D) None of the above

43. The bar graph is a pictorial representation of numerical data in the form of rectangles of :
(A) Equal width or varying heights
(B) Equal width and varying heights
(C) Equal width and constant heights
(D) None of the above

44. The number of times a particular observation occurs in a given data is called its :
(A) Range
(B) Frequency
(C) Group
(D) None of the above

45. The height (in cm) of 9 students of a class are as follows :
155, 160, 145, 149, 150, 147, 152, 144, 148.
The median of this data is :
(A) 147 cm
(B) 148 cm
(C) 150 cm
(D) 149 cm

46. A coin is tossed 150 times and head is obtained 71 times. Now, if the coin is tossed at random, what is the probability of getting a tail ?
(A) 70/150
(B) 1
(C) 71/150
(D) 79/150

47. Suppose we throw a die once, what is the probability of getting a number greater than 4 ?
(A) 1/6
(B) 3
(C) 4/6
(D) 1/3

48. A box contains 3 blue, 2 white and 4 red marbles. If a marble is drawn at random from the box, then what is the probability that it will be a red ?
(A) 1/9
(B) 1/3
(C) 2/9
(D) None of the above

49. An unbaised die is thrown, what is the probability of getting an even number ?
(A) 1/6
(B) 1/2
(C) 1/3
(D) None of the above

50. A card is drawn at random from a well shuffled deck of 52 cards. Find the probability of getting a club.
(A) 1/26
(B) 1/3
(C) 1/52
(D) None of the above

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