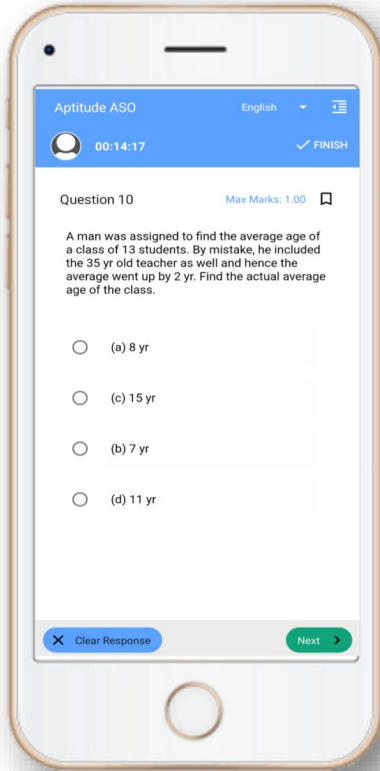


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Test Booklet Series

TEST BOOKLET

T. B. Code : ASG – 2/18

B

RECRUITMENT OF A. S. O.

(A) TEST OF REASONING & MENTAL ABILITY

SI. No. 421450

(B) MATHEMATICS

Time Allowed : 1½ Hours

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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 PLACE 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. YOU ARE REQUIRED TO FILL UP & DARKEN ROLL NO., TEST BOOKLET / QUESTION BOOKLET SERIES IN THE ANSWER SHEET AS WELL AS FILL UP TEST BOOKLET / QUESTION BOOKLET SERIES AND SERIAL NO. AND ANSWER SHEET SERIAL NO. IN THE ATTENDANCE SHEET CAREFULLY. WRONGLY FILLED UP ANSWER SHEETS ARE LIABLE FOR REJECTION AT THE RISK OF THE CANDIDATE.
5. This Test Booklet contains 100 items (questions) i.e. SI. No. 1 to 50 items (questions) for Test of Reasoning & Mental Ability & SI. No. 51 to 100 items (questions) for Mathematics. 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).
6. 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.
7. (i) 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.
(ii) There will be negative markings for wrong responses (answers). 25(twenty five) percentage of marks allotted to a particular item (question) will be deducted as negative marking for every response (answer).
(iii) If candidates give more than one response (answer), it will be treated as a wrong response (answer) even if one of the given responses (answers) happens to be correct and there will be same penalty as above to that item (question).
8. Before you proceed to mark (darken) in the Answer Sheet the responses (answers) to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions sent to you with your Admission Certificate.
9. 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.
10. Sheets for rough work are appended in the Test Booklet at the end.

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MATHEMATICS

51. A and B can do a work in 8 days, B and C can do the same work in 12 days, A, B and C together can finish the work in 6 days. So A and C together will do it in :
- (A) 8 days
(B) 4 days
(C) 6 days
(D) 12 days
52. A man crosses a 600 m long street in 5 min. His speed in km per hour is :
- (A) 3.6
(B) 7.2
(C) 8.4
(D) 10
53. $(64)^2 \div \sqrt[3]{32768} = ?$
- (A) 128
(B) 132
(C) 142
(D) 104
54. If α, β are the roots of a quadratic equation such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, then the equation is :
- (A) $x^2 - 24x + 128 = 0$
(B) $x^2 + 24x + 128 = 0$
(C) $x^2 + 24x - 128 = 0$
(D) None of these
55. If $\sqrt{3}x - 2 = 2\sqrt{3} + 4$ then the value of x is :
- (A) $2(1 - \sqrt{3})$
(B) $2(1 + \sqrt{3})$
(C) $1 + \sqrt{3}$
(D) $1 - \sqrt{3}$
56. When $x^3 + 3x^2 - kx + 4$ is divided by $x - 2$, the remainder is k. The value of k is :
- (A) 2
(B) 4
(C) 8
(D) 6

57. If $(2x + 5y) : (5x - 7y) = 5 : 3$ then $x : y$

(C) $-7, 1$

is :

(D) $1, 7$

(A) $50 : 19$

(B) $56 : 63$

(C) $48 : 56$

(D) $16 : 25$

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58. The fourth proportional to 5, 4,

25 is :

(A) 5

(B) 10

(C) 15

(D) 20

59. If $\begin{vmatrix} x + 3y & y \\ 7 - x & 4 \end{vmatrix} = \begin{vmatrix} 4 & -1 \\ 0 & 4 \end{vmatrix}$ then the

values of x and y are :

(A) $-7, -1$

(B) $7, -1$

60. If $M = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$ and $N = \begin{bmatrix} 2 & 0 \\ -1 & 2 \end{bmatrix}$ then

$M + 2N$ is :

(A) $\begin{bmatrix} 6 & 0 \\ 1 & 6 \end{bmatrix}$

(B) $\begin{bmatrix} 6 & 0 \\ -1 & 6 \end{bmatrix}$

(C) $\begin{bmatrix} 4 & 0 \\ -1 & 4 \end{bmatrix}$

(D) None of these

61. For which value of p , the pair of equations $4x + py + 8 = 0, x + y + 1 = 0$

has not unique solution :

(A) 4

(B) 2

(C) 1

(D) 3

NC - 2B/20

Contd.

62. The discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$ is :

- (A) -4
- (B) 2
- (C) 3
- (D) -8

- (B) 41
- (C) 45
- (D) 47

63. If a pair of linear equations is given by $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ where $a_1/a_2 \neq b_1/b_2$ then :

- (A) The pair of linear equations is consistent
- (B) The pair of linear equations is inconsistent
- (C) The pair of linear equations is independent
- (D) The pair of linear equations is dependent

64. In an A. P. the 5th and 8th terms are 11 and 17 respectively. The 15th term is :

- (A) 31

65. Which of the following are in A. P. ?

(A) $\frac{1}{\sqrt{3}} + \sqrt{3} + \frac{5}{\sqrt{3}} + \dots$

(B) $\frac{1}{\sqrt{3}} - (\sqrt{3} + 1) + \frac{5}{\sqrt{3}} + \dots$

(C) $\frac{1}{\sqrt{2}} + \sqrt{5} + \frac{\sqrt{3}}{2} + \dots$

(D) $\frac{1}{\sqrt{3} + 1} + \sqrt{3} + \frac{5}{\sqrt{3} + 2} + \dots$

66. The sum of three numbers in A. P. is 36 and their product is 1140, then one of the number is :

- (A) 19
- (B) 10
- (C) 6
- (D) 3

67. Find the sum of first 11 terms of an

A. P. of which the 6th term is 45 :

(A) 445

(B) 495

(C) 497

(D) 485

68. A computer company must have 20

programmers to handle system

programming jobs and 30

programmers for application

programming. Of those hired, 5 are

expected to perform jobs of both

types. How many programmers must

be hired ?

(A) 50

(B) 45

(C) 35

(D) 25

69. For an event if 'p' be the probability

of the happening of the event and 'q'

be the probability of not happening

the event then which one of the

following is true ?

(A) $p > q$

(B) $p + q = 1$

(C) $p < q$

(D) $p + q = 0$

70. Two dice are thrown. Find the

probability that getting a sum of 6 :

(A) $5/36$

(B) $1/36$

(C) $1/6$

(D) $5/18$

71. Three coins are tossed. Find the

probability of all heads :

(A) $1/8$

(B) $3/8$

(C) $5/8$

(D) $7/8$

72. The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is :
- (A) 3 ✓
(B) 13 ✗
(C) 23
(D) 33
- Handwritten notes for Q72: 50, 2490, 21, 2520
73. If a set has n elements then the power set of that set has _____ elements.
- (A) n^2
(B) 2^n
(C) $2n$
(D) None of these
74. Find the chance of picking an even number from the series of natural numbers 1 to 100 :
- (A) $\frac{1}{100}$
(B) $\frac{1}{50}$
(C) $\frac{1}{2}$
(D) None of these
75. An urn contains a thoroughly mixed set of 10 white, 15 red and 25 black marbles. Determine the probability of drawing a white or a red marble :
- (A) $\frac{1}{5}$
(B) $\frac{1}{2}$
(C) $\frac{3}{10}$
(D) None of the above
76. A solid metal cylinder of radius 14 cm and height 21 cm is melted down and recast into spheres of radius 3.5 cm. So the number of spheres that can be made is :
- (A) 48
(B) 54
(C) 63
(D) 72



77. How many times will the wheel of diameter 105 cm rotate in covering a distance of 330 m ?
- (A) 100 revolutions
(B) 110 revolutions
(C) 90 revolutions
(D) 105 revolutions
78. The area of the segment of a circle, if the angle of the sector is 120° and the radius of the circle is 21 cm is given by :
- (A) 190.953 sq. cm.
(B) 180 sq. cm.
(C) 271.047 sq. cm.
(D) 117.041 sq. cm.
79. A single letter is selected at random from the word PROBABILITY. The probability that it is a vowel is :
- (A) $\frac{3}{11}$
- (B) $\frac{4}{11}$
(C) $\frac{2}{11}$
(D) 0
80. A and B are two events such that $P(A) = 0.3$ and $P(A \cup B) = 0.8$. If A and B are independent then P(B) is :
- (A) $\frac{2}{3}$
(B) $\frac{3}{8}$
(C) $\frac{2}{7}$
(D) None of these
81. A bag contains 5 brown and 4 white socks. A man pulls out two socks. The probability that they are of the same colour is :
- (A) $\frac{5}{108}$
(B) $\frac{1}{6}$
(C) $\frac{5}{18}$
(D) $\frac{4}{9}$

82. Two dice are thrown simultaneously.

The probability of getting a total score

5 is :

(A) $\frac{1}{8}$

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

(C) $\frac{1}{9}$

(D) None of these

83. A bag contains 8 red and 6 blue balls.

If 5 balls are drawn at random, what

is the probability that 3 are red and 2

are blue ?

(A) $\frac{60}{143}$

(B) $\frac{59}{141}$

(C) $\frac{60}{141}$

(D) $\frac{59}{143}$

84. The G. M. of the numbers $3, 3^2, 3^3, \dots, 3^n$ is :

(A) $3^{2/n}$

(B) $3^{\frac{n-1}{2}}$

(C) $3^{\frac{n}{2}}$

(D) $3^{\frac{n+1}{2}}$

85. In a class of 100 students there are 70 boys whose average marks in a single subject are 75. If the average mark of the complete class is 72, then the average mark of the girls is :

(A) 73

(B) 65

(C) 68

(D) 74

Handwritten calculation:

$$\frac{75 \times 70}{100} = 52.5$$

$$\frac{52.5 \times 100}{100} = 52.5$$

$$72 - 52.5 = 19.5$$

$$\frac{19.5 \times 100}{30} = 65$$

86. The sum of 7 variates is 12. If six of them are 5, 13, 9, 17, 14 and 10, the 7th variate is :

(A) 12

(B) 16

(C) 17

(D) 18

87. The median of the following distribution is :

Weight in nearest kg.	No. of students
46	7
48	5
50	8
52	12
53	10
54	2
55	1

- (A) 50
(B) 53
(C) 52
(D) 54

88. The mode of the following frequency distribution is :

Marks obtained (out of 10)	No. of students
0	3
2	5
3	12
4	18
6	21
7	8
9	2
10	1

- (A) 21

- (B) 8
(C) 6
(D) None of these

89. The variance of the first n natural numbers is :

(A) $\frac{n^2 - 1}{12}$

(B) $\frac{n^2 - 1}{6}$

(C) $\frac{n^2 + 1}{6}$

(D) $\frac{n^2 + 1}{12}$

90. The lower quartile range for the data

9, 11, 15, 19, 17, 13, 7 is :

- (A) 7
(B) 11
(C) 9
(D) 8



91. $\frac{1}{1.4} + \frac{1}{4.7} + \frac{1}{7.10} + \frac{1}{10.13} + \frac{1}{13.16} = ?$

(A) $\frac{1}{3}$

(B) $\frac{5}{16}$

(C) $\frac{3}{8}$

(D) $\frac{41}{7280}$

92. What least number of five digits is exactly divisible by 41 ?

(A) 10045

(B) 10004

(C) 10041

(D) 10025

Handwritten calculation for Q92:

$$\begin{array}{r} 10045 \quad | \quad 41 \\ \underline{82} \\ 184 \\ \underline{168} \\ 265 \\ \underline{204} \\ 10041 \end{array}$$

93. HCF of $\frac{9}{10}$, $\frac{12}{25}$, $\frac{18}{35}$ and $\frac{21}{30}$ is:

(A) $\frac{3}{5}$

(B) $\frac{252}{5}$

(C) $\frac{3}{1400}$

(D) $\frac{63}{700}$

94. 0.04×0.0162 is equal to :

(A) 6.48×10^{-3}

(B) 6.48×10^{-5}

(C) 6.48×10^{-4}

(D) 6.48×10^{-6}

95. $\frac{(489 + 375)^2 - (489 - 375)^2}{489 \times 375} = ?$

(A) 144

(B) 864

(C) 2

(D) 4

96. $0.\overline{63} + 0.\overline{37} + 0.\overline{80} = ?$

(A) $1.\overline{79}$

(B) 1.80

(C) $1.\overline{80}$

(D) $1.\overline{81}$

Handwritten calculation for Q96:
 1.20

97. Two numbers are respectively 20% and 50% more than a third number.

These two numbers are in the ratio :

(A) 2 : 5

(B) 4 : 5

(C) 6 : 7

(D) 3 : 5

98. A fruit seller had some apples. He sells 40% and still has 420 apples. Originally he had :
- (A) 588 apples
(B) 600 apples
(C) 672 apples
(D) 700 apples
99. 100 oranges are bought at the rate of Rs. 350 and sold at the rate of Rs. 48 per dozen. The percentage of profit or loss is :
- (A) $14\frac{2}{7}\%$ gain
(B) 15% gain
(C) $14\frac{2}{7}\%$ loss
(D) 15% loss
100. The difference between the simple and compound interest on Rs. 4,000 for 2 years at 10% per annum is :
- (A) Rs. 20
(B) Rs. 30
(C) Rs. 40
(D) Rs. 60

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