

DAV ADMISSION TEST(DATCSP)

for

SUPER 40(2016-17)

(PAPER-II)

MATHEMATICS

ID NO.

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SET - D

TIME : 1 HOUR

(3.00 P.M. TO 4.00 P.M.)

Guidelines to the Candidates :

1. This Booklet contains 6 printed pages and two blank pages for rough work. Any defect found should be brought to the notice of the invigilator immediately.
2. Fill in the particulars in the OMR Sheet given to you separately as per the directions given therein.
3. Use Blue/Black Ball Point Pen only for writing particulars/markings responses in OMR Sheet. **Use of Pencil is strictly prohibited.**
4. This test is of **ONE** hour duration.
5. There are four choices in every question as A, B, C and D. There is only one correct response for each question. Each question carries 4 marks.
6. (i) The test consists of 20 multiple choice questions carrying maximum 80 marks.
(ii) -1 mark will be awarded for each wrong answer/multiple answer.
(iii) No mark will be awarded for any overwriting/scratching answer.
7. No candidate shall leave his/her seat during the examination.
8. Do not tear/remove any page of this booklet.
9. Calculation, if any, may be done at the blank pages of this booklet provided at the end for rough work.
10. Calculator and other electronic gadgets are not allowed.
11. After finishing the test the OMR Sheet is to be handed over to the invigilator before leaving the Examination Hall.

SEAL

FASCIMILE STAMP

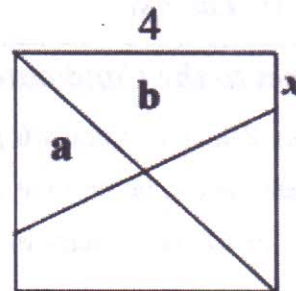
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1. Square ABCD has side length 13, and points E and F are exterior to the square such that $BE = DF = 5$ and $AE = CF = 12$. Find EF^2 .

- a) $17\sqrt{2}$
- b) 17
- c) 18
- d) $18\sqrt{2}$

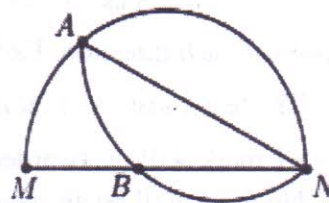
2. The diagram shows a square, with one diagonal drawn. A second line is drawn which passes through the centre of the square and meets two sides at a distance x from a corner. The square has sides of length 4 cm. The letters a and b represent the areas of the regions, and $b = 2a$. The value of x is:

- a) $8/3$
- b) $7/3$
- c) $4/3$
- d) $5/3$



3. In the following diagram, a semicircle is folded along a chord AN and intersects its diameter MN at B . Suppose $MB : BN = 2 : 3$ and $MN = 10$. If $AN = x$, find x^2

- a) 60
- b) 40
- c) 64
- d) 48



4. Rahul put 120 identical cubes together to form a rectangular prism. He then painted all 6 faces of the prism. Once the paint had dried he disassembled the cubes and found that 24 of the cubes had not been painted on any face. The surface area of the prism he formed was

- a) 148
- b) 150
- c) 152
- d) 154

5. The six-digit number $4m61n2$ is divisible by both 11 and 4. The number of different combinations of m and n that satisfy the above condition is:

- a) 4
- b) 6
- c) 8
- d) 10

6. Let x be any real number. The greatest possible value of $3^x - 9^x$ is

- a) $1/4$
- b) $3 - \sqrt{3}$
- c) $1 - 1/\sqrt{3}$
- d) Infinite

7. A goat is tied to a corner of a rectangular plot of dimensions $42\text{ m} \times 21\text{ m}$ with a rope 28 m long. It cannot enter inside the plot but can graze outside it as permitted by the rope. Find the area it can graze (in sq.m).

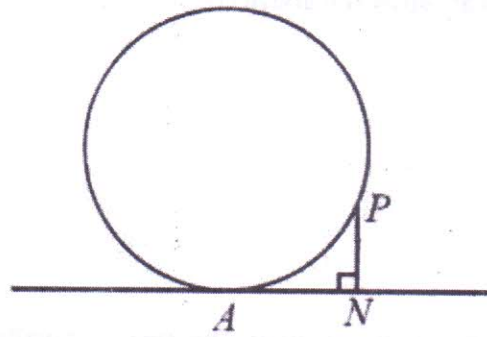
(Take $\pi = 22/7$).

- a) 1997.5
- b) 1962.5
- c) 1886.5
- d) 2016

8. There are 8375 raisin chocolates, 5025 almond chocolates and 20100 cashew nut chocolates available. The chocolates have to be arranged in boxes such that the combination of chocolates in each box is the same i.e., each box contains the same number of chocolates of each kind and no chocolates of any kind are left over. Find the number of boxes required if minimum number of chocolates are put in each box.

- a) 1675
- b) 1785
- c) 1895
- d) 1681

9. A circle is tangent to a line at A. From a point P on the circle, a line is drawn such that PN is perpendicular to AN. If PN = 9 and AN = 15, determine the radius of the circle.



- a) 17
- b) 15
- c) 25
- d) $63/4$

10. If a and b are real numbers such that $3(2^a) + 2^b = 7\sqrt{2}$ and $5(2^a) - 2^b = 9\sqrt{2}$, what is the value of a + b?

- a) 1
- b) 2
- c) 3
- d) 4

11. If a die is rolled once, the probability that a 4 shows up is $1/6$. If three dice are rolled the probability that a 4 shows up exactly once is $x/72$. What is the value of x?

- a) 25
- b) 36
- c) 30
- d) 18

12. A rectangle has an area which is numerically equal to its perimeter, where both the length and the breadth are integers. The rectangle is not a square. The length of the shortest side of the rectangle is:

- a) 2
- b) 6
- c) 3
- d) 1

13. The largest prime factor of $7^{99} + 7^{100} + 7^{101}$ is

- a) 7
- b) 13
- c) 17
- d) 19

14. From a place P, buses to A leave once every 30 minutes, buses to B leave once every 35 minutes, buses to C leave once every 45 minutes. If buses left for A, B and C simultaneously at 10:00 a.m, from P, when is the next occasion when buses leave together for each of the 3 destinations?

- a) 12:30 p.m.
- b) 8:50 p.m.
- c) 10:30 p.m.
- d) 8:30 p.m.

15. If $(y - a)(y - 10) + 1 = 0$ and y is an integer, find the number of possible integer values for a .

- a) 0
- b) 1
- c) 2
- d) 3

16. The function $f(x)$ satisfies the equation $(x - 1)f(x) + f(1/x)' = 1$, for all x not equal to 0. The value of $f(2)$ is

- a) 0
- b) 1
- c) 2
- d) 0.50

17. When 36162 and 30512, are divided by a three digit number the same remainder is left in each case. Which of the following could be the three-digit number?

- a) 103
- b) 107
- c) 109
- d) 113

18. Some positive integers have cubes whose last two digits are 88. What is the sum of the two smallest such integers?

- a) 134
- b) 144
- c) 156
- d) 176

19. Let QRS be a triangular park in xy -plane with side $RS = 375$ m and $\angle QRS = 90^\circ$. A pole PQ vertical to the xy -plane is fixed at Q with height $PQ=h$. If $\tan PRQ = 17/25$ and $\tan PSQ = 8/25$, then the value of h (in m) is

- a) 200
- b) 164
- c) 136
- d) 125

20. The sum of the squares of 4 consecutive natural numbers is 5334. The smallest of these 4 numbers is

- a) 37
- b) 41
- c) 33
- d) 35