

Please check that this question paper contains 38 questions and 10 printed pages.

Roll No. : _____

**D.A.V. INSTITUTIONS, CHHATTISGARH
PRACTICE PAPER 2**

CLASS: X

SUBJECT: MATHEMATICS (BASIC)

TIME: 3 HOURS

MAX MARKS: 80

General Instructions:

1. This Question Paper has 5 sections A – E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 2 marks each.
4. Section C has 6 questions carrying 3 marks each.
5. Section D has 4 questions carrying 5 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All questions are compulsory. However, an internal choice of 2 questions of 2 marks, 2 questions of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

SECTION A

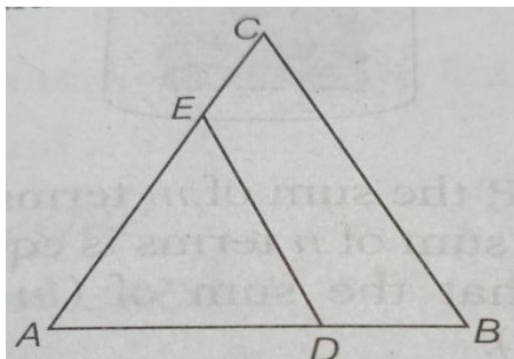
Section A consists of 20 questions of 1 mark each.

Q. No.		Marks
1	The largest number that divides 70 and 125, which leaves the remainder 5 and 8 respectively is a) 13 b) 15 c) 25 d) 65	1
2	The least number that is divisible by all the numbers from 1 to 5 is: a) 60 b) 70 c) 80 d) 90	1
3	If $\frac{1}{2}$ is a root of equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is : a) -2 b) $\frac{1}{4}$ c) $\frac{1}{2}$ d) 2	1

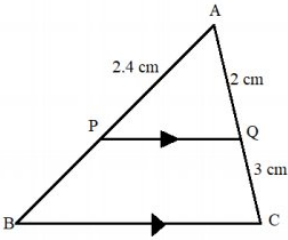
15	The probability of getting a perfect square number from the numbers 1 to 10 is: a) $\frac{3}{10}$ b) $\frac{1}{2}$ c) $\frac{2}{5}$ d) $\frac{1}{5}$	1
16	Which of the following is not a measure of central tendency? a) Mode b) Range c) Median d) Mean	1
17	Volume of two spheres are in ratio 64 : 27. The ratio of their surface area is: a) 3 : 4 b) 4 : 3 c) 9 : 16 d) 16 : 9	1
18	If 35 removed from the data, 30, 34, 35, 36, 37, 38, 39, 40 then the median increases by: a) 2 b) 1.5 c) 1 d) 0.5	1
19	Assertion (A): The point (4, 0) lies on the x – axis. Reason (R): The Y co-ordinate of the point on x - axis is zero. a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A). c) Assertion (A) is true but Reason (R) is false. d) Assertion (A) is false but Reason (R) is true.	1
20	Assertion (A): 12^n ends with the digit zero, where n is any natural number. Reason (R): Any number ends with digit zero, if its prime factor is of the form $2^m \times 5^n$, where m and n are natural numbers. a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A). c) Assertion (A) is true but Reason (R) is false. d) Assertion (A) is false but Reason (R) is true.	1
SECTION B		
Section B consists of 5 questions of 2 marks each.		
21	Sum of two numbers is 35 and their difference is 13. Find the numbers.	2
22	PQR is a right triangle right angled at Q and $QS \perp PR$. If $PQ = 6\text{cm}$ and $PS = 4\text{cm}$, find QS, RS and QR.	2

OR

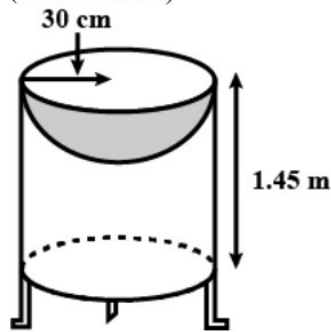
In the given figure, $DE \parallel BC$. If $AD = x$, $DB = x - 2$, $AE = x + 2$ and $EC = x - 1$



23	If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80° , then $\angle POA$ is equal to?	2
24	Given a right angled ΔABC , right angled at B in which $\tan A = \frac{15}{8}$ and $\tan C = \frac{8}{15}$ then find the value of $\sin (A + C)$.	2
25	The minute hand of a clock is 3.5 cm long. What is the angle described by the minute hand in 20 minutes.	2
OR		
The perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm. Find the area of the sector.		
SECTION C		
Section C consists of 6 questions of 3 marks each.		
26	Prove that $\frac{3\sqrt{2}}{5}$ is irrational.	3
27	If the sum of squares of zeroes of the polynomial $x^2 - 8x + k$ is 40, find the value of k.	3
28	There are three consecutive positive integers such that the sum of the square of the first and the product of the other two is 154. Find the integers.	3
OR		
In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.		
29	A circle touches all 4 sides of quadrilateral ABCD. Prove that $AB + CD = AD + BC$.	3

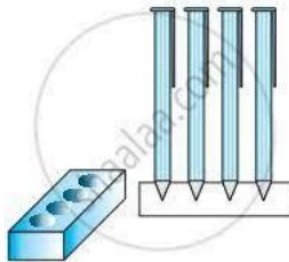
30	<p>If $x = a \sin \theta$ and $y = b \tan \theta$, then prove that $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$.</p> <p>OR</p> <p>If $\sec \theta + \tan \theta = p$, then prove that $\sin \theta = \frac{p^2 - 1}{p^2 + 1}$.</p>	3
31	<p>A box contains cards bearing numbers from 6 to 70. If one card is drawn at random from the box, find the probability that it bears,</p> <p>(i) A number divisible by 5</p> <p>(ii) An odd number less than 30</p> <p>(iii) A composite number between 50 and 70</p>	3
SECTION D		
Section D consists of 4 questions of 5 marks each.		
32	<p>An express train takes 1h less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of express train is 11km/h more than that of the passenger train, find the average speed of two trains.</p> <p style="text-align: center;">OR</p> <p>The ratio of the income of two friends Jasmine and Aman is 9:7 and the ratio of their expenditure is 4:3. If each of them saves Rs 6000 per month. Find their monthly incomes. Also, if each of them donates 2% of their incomes to a charity working for old age destitute. Find the resulting saving of each.</p>	5
33	<p>Prove that if a line drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Using this find BP in given diagram.</p> <div style="text-align: center;">  </div>	5
34	<p>Mayank made a bird-bath for his garden in the shape of cylinder with a hemispherical depression at one end as shown in figure. The height of the hollow cylinder is 1.45 m and its radius is 30 cm. Find</p>	5

the total surface area of the bird-bath. (Take $\pi=22/7$)



OR

A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold Pens. The dimensions of the cuboid are 15cm by 10cm by 3.5cm. The radius of each of the depression is 0.5cm and the depth is 1.4cm .Find the volume of the wood in the entire stand, correct to 2 decimal places.



35 A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onward but less than 60 year.

5


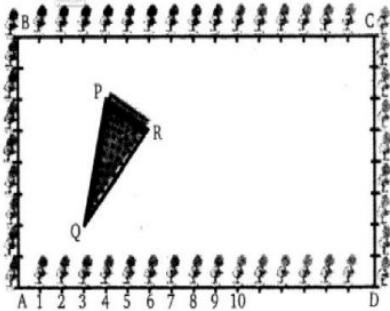
Age (in years)	Number of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100

SECTION E

Section E consists of 3 questions of 4 marks each.

36 In the class the teacher asks every student to write an example of A.P. Two friends Geeta and

1

	<p>Madhuri write their progressions as $-5, -2, 1, 4, \dots$ and $187, 184, 181, \dots$ respectively. Now, the teacher asks the questions from various students of class. Some of them are:</p>  <p>a) Find the 34th term of the progression written by Madhuri. b) Find the 37th term of the progression written by Geeta. c) Sum of the common difference of the two progressions.</p> <p style="text-align: center;">Or</p> <p>Sum of first 45 terms of Progression made by Madhuri.</p>	<p>1 1 2</p>
37	<p>The class X students of school in Krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.</p>  <p>a) Taking A as origin, find the coordinates of P. b) What will be the coordinates of R, if C is the origin? c) What will be the distance between PR ?</p> <p style="text-align: center;">Or</p> <p>Find the distance between PQ.</p>	<p>1 1 2</p>
38	<p>Air traffic Control (ATC) is a service provided by ground-based air traffic controllers who direct aircraft on the ground and through a given section of controlled airspace, and can provide</p>	

advisory services to aircraft in non-controlled airspace. Actually, all this air traffic is managed and regulated by using various concepts based on coordinate geometry and trigonometry.



At a given instance, ATC finds that the angle of elevation of an airplane from a point on the ground is 60° . After a flight of 30 seconds, it is observed that the angle of elevation changes to 30° . The height of the plane remains constantly as $3000\sqrt{3}$ m. Use the above information to answer the following questions:-

- a) Draw neat labeled figure to show the above situation diagrammatically.
- b) What is the distance travelled by the plane in 30 seconds?
- c) Keeping the height constant, during the above flight, it was observed that after $15(\sqrt{3}-1)$ seconds, the angle of elevation changes to 45° . How much is the distance travelled in that duration.

OR

What is the speed of the plane in km/hr.

1

1

2