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X – A
Roll no. – 40
16.9.16

SUMMATIVE ASSESSMENT – I, 2016-17
MATHEMATICS
Class – X (SET-2)

Time Allowed: 3 hours **Maximum Marks: 90**

General Instructions:

1. All questions are compulsory.
2. The question paper consists of 31 questions divided into four sections A, B, C and D. Section-A comprises of 4 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 11 questions of 4 marks each.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

SECTION-A

Question numbers **1** to **4** carry one mark each

1 For a certain distribution, mode and median were found to be 1000 and 1250 respectively. Find mean for this distribution, using an empirical relation. 1

2 If $\theta = 45°$, then find the value of $\sec\theta.\cot\theta - \operatorname{cosec}\theta.\tan\theta$. 1

3 Evaluate : 1

$$\frac{\operatorname{cosec} 13°}{\sec 77°} - \frac{\cot 20°}{\tan 70°}$$

4 M and N are points on the sides PQ and PR respectively of a ΔPQR. If $PN = 4.8$ cm, $NR = 1.6$ cm, $PM = 4.5$ cm and $MQ = 1.5$ cm, then find whether $MN \| QR$ or not. 1

SECTION-B

Question numbers **5** to **10** carry two marks each.

5 Simplify : 2

$(1 - \sin A)(\tan A + \sec A)$

6 ABC is an isosceles triangle in which $AB = AC$ and $BC^2 = 2AB^2$. Prove that ABC is a right triangle. 2

7 Given the linear equation $3x - 4y - 7 = 0$, write another linear equation in these two variables such that the geometrical representation of the pair so formed is : 2

(i) intersecting lines (ii) parallel lines

8 Determine whether the following number have a terminating decimal expansion or non-terminating repeating decimal expansion : $\frac{17}{3125}$ 2

9 Show that every odd positive integer is of the form $4m + 1$, $4m + 3$ for some integer. 2

10 The following table shows the daily consumption of milk in 40 houses of a locality : 2

Consumption (in litres)	0 - 0.5	0.5 - 1	1 - 1.5	1.5 – 2	2 - 2.5
Number of houses	7	15	10	5	3

Find the modal class and median class for the data.

SECTION-C

Question numbers **11** to **20** carry three marks each.

11 If 2 is a zero of both the polynomials $3x^2+ax-14$ and $2x^3+bx^2+x-2$, then find the value of $2a+3b$. 3

12 Solve for x and y : 3

$7x-5y=2$

$x+2y=3$

13 Find HCF of the numbers 1405, 1465 and 1530 by Euclid's division algorithm. 3

14 Divide the polynomial $6x^4-44x^2+6x-3$ by the polynomial x^2-3x+1 and verify the division algorithm. 3

15 Show that the line segment joining the mid-point of non-parallel sides of a trapezium is parallel to the parallel sides. 3

16 Calculate the mode of the following frequency distribution : 3

Marks	2 - 4	4 - 6	6 - 8	8 - 10
No. of students	3	4	2	1

17 Prove the identity : 3

$(\sec A - \cos A).(\cot A + \tan A) = \tan A.\sec A.$

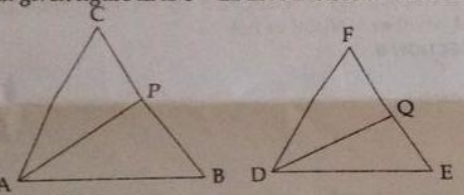
18 If $\operatorname{cosec}\theta = \frac{5}{3}$, evaluate : 3

$$\frac{4\sec\theta - 2\tan\theta + 5\sin\theta}{20\cos\theta - 3\operatorname{cosec}\theta + 9\cot\theta}$$

19 The arithmetic mean of the following frequency distribution is 25. Determine the value of p. 3

Class interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	5	18	15	p	6

20 In given figure $\Delta ABC \sim \Delta DEF$. AP bisects $\angle CAB$ and DQ bisects $\angle FDE$ 3



Prove that

(a) $\frac{AP}{DQ} = \frac{AB}{DE}$

(b) $\Delta CAP \sim \Delta FDQ$.

SECTION-D

Question numbers **21** to **31** carry four marks each.

21 Draw the graph of the following pair of linear equations : 4

$x+3y=6$ and $2x-3y=12$

22 Obtain all other zeroes of the polynomial $9x^4-6x^3-35x^2+24x-4$, if two of its zeroes are 2 and -2. 4

23 Prove that $\sqrt{5}$ is an irrational number. Hence show that $3+2\sqrt{5}$ is also an irrational number 4

24 A lending library has a fixed charge for the first three days and additional charge for each day thereafter. Ram returned a book after one week and paid ₹ 40, while Shyam paid ₹ 60 as he returned it after eleven days. Find the fixed charge and the additional charge paid by them. 4

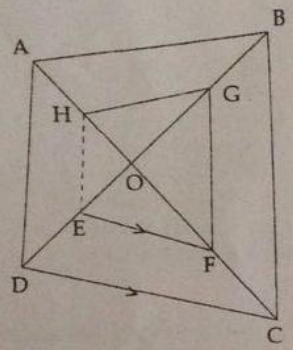
Are you in favour of public libraries ?

If $m = \text{cosec}A - \sin A$ and $n = \sec A - \cos A$, 4

prove that $(m^2n)^{\frac{2}{3}} + (mn^2)^{\frac{2}{3}} = 1$

26 If the diagonals of a quadrilateral divide each other proportionally, prove that it is a trapezium. 4

27 In given figure EF||DC, FG||CB and GH||BA, prove that HE||AD. 4



28 If $\sin(A + B) = 1$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$; $0° < A + B < 90°$ and $A > B$, then find the values of A and B. 4

29 Prove that : 4

$$(\tan\theta + \sec\theta - 1).(\tan\theta + 1 + \sec\theta) = \frac{2\sin\theta}{1 - \sin\theta}$$

30 In an apple orchard, the number of apples on 80 trees are as follows : 4

Number of apples	40-60	60-80	80-100	100-120	120-140	140-160	160-180
Number of trees	12	11	14	16	13	9	5

Find the mode and median of the above data.

31 The following are the ages of 200 patients getting medical treatment in a hospital on a particular day : 4

Age (in years)	10-20	20-30	30-40	40-50	50-60	60-70
Number of Patients	40	22	35	50	23	30

Write the above distribution as less than type cumulative frequency distribution and also draw an ogive to find the median.

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