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X-C 36
(RRPS)

XT4YF5N

SUMMATIVE ASSESSMENT – I, 2016-17
MATHEMATICS
Class – X

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.

1 In ΔPQR, S and T are points on the sides PQ and PR respectively such that ST || QR. If PS = 4 cm, PQ = 9 cm and PR = 4.5 cm, then find PT. 1

2 Evaluate : 1
$\text{Tan}65^0/\text{cot}25^0$

3 Find the value of 1
$2\tan30^0/1+\tan^230^0$

4 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

SECTION-B

Question numbers 5 to 10 carry two marks each.

5 Prove that $5 + \sqrt{3}$ is irrational 2

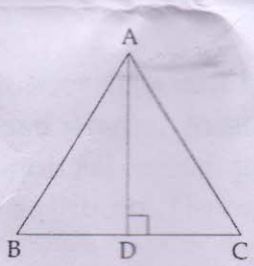
6 Without performing long division, determine whether the number $\frac{320}{455}$ have a terminating decimal expansion or a non-terminating repeating decimal expansion. 2

7 For which values of a and b does the following pair of linear equations has infinite number of solutions? 2

$2x-3y=7$

$ax+3y=b$

8 In the figure, ABC is a triangle in which AD ⊥ BC. Show that $AB^2 + CD^2 = BD^2 + AC^2$ 2



9 cosA/(1+sinA) + (1+sinA)/cosA = 2secA 2

10 The following table gives the literacy rate (in %) of 25 cities. Find the median class and modal class. 2

Literacy rate (in percent)	50 - 60	60 - 70	70 - 80	80 – 90
Number of cities	9	6	8	2

SECTION-C

Question numbers 11 to 20 carry three marks each.

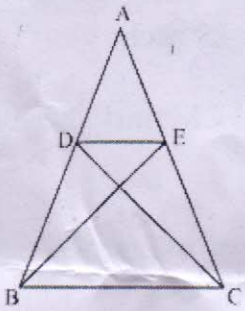
11 An army contingent of 678 soldiers is to march behind an army band of 36 members in a Republic Day parade. The two groups are to march in the same number of columns. What is the maximum number of columns they can march? 3

12 Divide $3x^3 + x^2 + 2x + 5$ by $1 + 2x + x^2$? 3

13 Find the zeros of the quadratic polynomial $6x^2 - 3-7x$ and verify the relationship between the zeroes and the coefficients. 3

14 The larger of the two supplementary angles is 46° more than the smaller angle. Find the angles. 3

15 In figure if ΔABE congruent to ΔACD, show that $\Delta ADE \sim \Delta ABC$. 3



16 In a parallelogram ABCD, E is any point on side BC. Diagonal BD and AE intersect at P. Prove that $DP \times EP = PB \times PA$. 3

17 3

If $\cot\theta = \frac{15}{8}$, evaluate:

$$\frac{4\cot\theta - 5\sec\theta - 8\,\text{cosec}\theta}{5\tan\theta + \frac{4}{3}\cot\theta - 17\sin\theta}$$

18 Given below is a grouped frequency distribution : 3

Class interval	100-150	150-200	200-250	250-300	300-350	350-400
Frequency	8	15	29	11	17	10

Make a cumulative frequency distribution table of 'less than type' for it.

19 Find the mean of the following frequency distribution 3

Class interval	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency	3	5	7	3	2

3

20 A school conducted a test (of 100 marks) in English for students of Class X. The marks obtained by students are shown in the following table :

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number of students	1	2	4	15	15	25	15	10	2	1

Find the modal marks.

SECTION-D

Question numbers 21 to 31 carry four marks each.

21 The product of two numbers x and y is 217728. Find the LCM and HCF of x and y if it is given that LCM$(x, y) = 42.$HCF(x, y). 4

22 Obtain all other zeroes of $2x^4 - 3x3 - 3x^2 + 6x - 2$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$. 4

23 Solve the following pair of linear equations graphically : 4

$6x - y + 4 = 0$

$2x - 5y = 8$

Shade the region bounded by the lines and y– axis.

24 A lending library has a fixed charge for one week, and charges fine for keeping the book for each day thereafter. Vansh had issued a book and paid ₹ 35 as he delayed it by one day due to rain on that day. Paritosh had issued a book, but paid ₹ 115 for a book as he had forgotten to return it and delayed it by five days and he returned it after getting a reminder from the concerned person. Find the fixed charge and the total amount of fine money paid by them. What is the behaviour shown by Vansh? 4

25 State and prove Basic propertionality theorem 4

26 Prove that the area of an equilateral triangle describe on one side of a square is equal to half the area of equilateral triangle described on one of its diagonals. 4

27 If $A = 60°$ and $B = 30^0$, show that : 4

(a) $\sin(A+B) = \sin A \cdot \cos B + \cos A \cdot \sin B$

(b) $\cos(A+B) = \cos A \cdot \cos B - \sin A \cdot \sin B$

28 Prove that $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$ 4

29 Prove that: 4

$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

30 Production of wheat in 100 farms of a villages is given below : 4

Production (In kg/hectare)	More than or equal to 50	More than or equal 55	More than or equal 60	More than or equal 65	More than or equal 70	More than or equal 75	More than or equal 80
Number of farms	100	98	90	78	60	35	13

Draw a 'more than type' ogive for the above data. Find the median from the curve and verify it by actual calculation.

31 On the Sports day of a school, 300 students participated. Their ages are given in the following distribution : 4

Age (in years)	5-7	7-9	9-11	11-13	13-15	15-17	17-19
Number of students	67	33	41	95	36	13	15

Find the mean and mode of the data.

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