

K.V. SEC-12

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GR

No. of Printed Pages : 4

SUMMATIVE ASSESSMENT-I (2016-17)

Subject - Mathematics

Class - X

M.M. : 90

Time : 3:00 Hours

General Instructions :

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

SECTION - A

Question 1 to 4 carry one mark each.

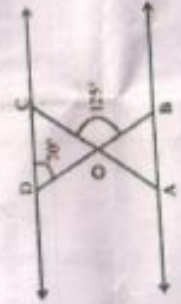
- Find the value of k so that the following system of equations has no solution.
 $3x - y - 5 = 0$, $6x - 2y + k = 0$.
- The mean and mode of a frequency distribution are 30 and 45 respectively, find the median.
- In $\triangle ABC$, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm. Find $\angle B$.
- If $\sin A = \cos A$. Find the value of A .



SECTION - B

Question 5 to 10 carry two marks each.

- Use Euclid's division algorithm to find out the HCF of 867 and 255.
- Find the quadratic polynomial, the sum and product are 2 and 1 respectively.
- The coach of a cricket team buys 3 bats and 6 balls for Rs 3900. Later, she buys another bat and 3 more balls of the same kind for Rs 1300. Represent this situation algebraically.
- Explain why $7x + 13 + 13$ is a composite number?
- In fig. $\triangle ODC$, $\triangle OBA$, $\angle BOC = 125^\circ$ and $\angle CDO = 70^\circ$. Find $\angle DOC$, $\angle DCO$ and $\angle OBA$.



10. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a household:

f_1	f_2	f_3	f_4	f_5
1	2	3	4	5

Family size	1-3	3-5	5-7	7-9	9-11
Number of families	7	8	2	2	1

Find the mode of the data. ①

SECTION -C.

Question 11 to 20 carry three marks each.

11. Find the HCF of 96 and 404 by the prime factorization method. Hence, find their LCM.
12. A girl of height 90cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamp is 3.6m above the ground, find the length of her shadow after 4 second.
13. Find the zeroes of the quadratic polynomial $x^2+7x+10$, and verify the relationship between the zeroes and the coefficients.
14. The difference between two numbers is 26 and one number is three times the other. Form the pair of linear equations for the problem and find the numbers.
15. If the areas of two similar Triangles are equal, prove that they are congruent.
16. If $\sin A = 3/4$, calculate $\cos A$ and $\tan A$.
17. If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \frac{1}{\sqrt{3}}$; $0^\circ < A + B \leq 90^\circ$; $A > B$, find A and B .
18. Consider $\triangle ABC$, right-angled at C , in which $AB = 29$ units, $BC = 21$ units and $\angle ABC = \theta$. Determine the values of
 (i) $\cos^2 \theta + \sin^2 \theta$
 (ii) $\cos^2 \theta - \sin^2 \theta$
19. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs. 18. Find the missing frequency f .
- | | | | | | | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Daily pocket allowance in RS. | 11-13 | 13-15 | 15-17 | 17-19 | 19-21 | 21-23 | 23-25 |
| Number of children | 7 | 6 | 9 | 13 | f | 5 | 4 |
20. The given distribution shows the number of runs scored by some top batsman of the world in one-day international cricket matches.

Runs scored	Number of batsman
3000-4000	4
4000-5000	18
5000-6000	9
6000-7000	7
7000-8000	6
8000-9000	3
9000-10000	1
10000-11000	1

Find the median of the data.

$$\begin{array}{r}
 3 \overline{) 72.3} \\
 \underline{60} \\
 12 \\
 \underline{10} \\
 23
 \end{array}$$

SECTION - D

Question 21 to 31 carry four marks each.

21. Prove that $\sqrt{5}$ is an irrational number.
22. Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.
23. Formulate the following problem as a pair of equations, hence find their solutions: "2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the work, and also that taken by one man alone."
- Or
- 3 chairs and 2 tables cost Rs. 700 and 5 chairs and 3 tables cost Rs. 1100. A man purchased 2 chairs and 2 tables and paid Rs. 700 to the shopkeeper. Shopkeeper said "it is not the correct amount" and return him the balance. Find the correct amount and amount paid back by the shopkeeper. Which value depicted by the shopkeeper?
24. Solve the following pair of equations by reducing them to a pair of linear equations:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

25. Prove that if a line is 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.

26. In triangle ABC, right angled at B, if $\tan A = \frac{1}{\sqrt{3}}$. Find the value of;

- (i) $\sin A \cos C + \cos A \sin C$
 (ii) $\cos A \cos C - \sin A \sin C$

27. Prove that

$$\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = 1 + \sec \theta \operatorname{cosec} \theta$$

OR

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A, \text{ using the identity } \operatorname{cosec}^2 A = 1 + \cot^2 A$$

28. Prove that

$$\left(\frac{1 + \tan^2 A}{1 + \cot^2 A} \right) = \left(\frac{1 - \tan A}{1 - \cot A} \right)^2 = \tan^2 A$$

29. The following distribution gives daily income of 50 workers of a factory.

Daily Income (in Rs)	Number of workers
100 - 120	12
120 - 140	14
140 - 160	8

160 - 180	6
180 - 200	10

Convert the distribution above to a less than type cumulative frequency distribution and draw its ogive.

30. The Median of the following data is 32.5. Find the value of x and y.

Class Interval	Frequency
0 - 10	x
10 - 20	5
20 - 30	9
30 - 40	12
40 - 50	y
50 - 60	3
60 - 70	2
	40

31. Prove that the square of the hypotenuse is equal to the sum of the squares of the other two sides is a right triangle.