WYY7JRZ

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.

SECTION-A
Question numbers 1 to 4 carry one mark each

1. R and S are points on the sides DE and EF respectively of a ΔDEF such that ER = 5 cm, RD = 2.5 cm, SD = 1.5 cm and FS = 3.5 cm. Find whether RS ∥ DF or not.   1

SE –7.5cm

2. Evaluate :   1

$$\frac{\tan 15°}{\cot 75°} + \frac{\sin 25°}{\cos 65°}$$

3. Write the expression in simplest form : $\sec^2\theta - \dfrac{1}{\csc^2\theta - 1}$.   1

4. Write an empirical relationship between the three measures of central tendency i.e mean, median and mode.   1

SECTION B
Question numbers 5 to 10 carry two marks each.

5. Use Euclid division algorithm to find that the pair of numbers 615, 154 is co - prime or not ?   2

6. Write down the decimal expansion of $\dfrac{13}{64}$, without actual division.   2

7. Find whether the lines representing the following pair of linear equations intersect at a point, are parallel or coincident :   2
$2x - 3y + 6 = 0$
$4x - 5y + 2 = 0$

8. In a quadrilateral ABCD, if $\angle A = \angle D = 90°$, then prove that $BD^2 - AC^2 = AB^2 - DC^2$.   2

9. In a right angled ΔUVW right angled at W, if sin U = sin V, then show that $\angle U = \angle V$.   2

10. Given below is a cumulative frequency distribution of 'less than type' :   2

Marks obtained	less than 20	less than 30	less than 40	less than 50
Number of students (cumulative frequency)	8	13	19	24

Change the above data in to a continuous grouped frequency distribution.

SECTION-C
Question numbers **11** to **20** carry three marks each.

11. Find the LCM and HCF of 26, 72 and 108 by prime factorization method.   3

12. On dividing $x^3 - 5x^2 + 6x + 4$ by a polynomial $g(x)$, the quotient and the remainder were $x - 3$ and 4 respectively. Find $g(x)$ 3

13. If α and β are zeroes of a quadratic polynomial $4x^2 + 4x + 1$ then form a quadratic polynomial whose zeroes are 2α and 2β.   3

14. The sum of two natural numbers is 240 and they are in the ratio, 3 : 5. Find the numbers.   3

15. In given figure, OA = 3 cm, OC = 4 cm and AB = 12 cm find perimeter of $\triangle ABC$.   3
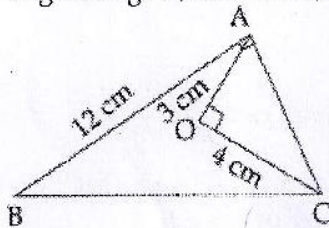
16. In $\triangle ABC$, AB = AC and D is a point on side AC such that $BC^2 = AC \times CD$. Prove that BD = BC.   3

17. If $\sec \theta = 2$, then evaluate :   3

$$\frac{4 \cos 0 - \sqrt{3} \sin \theta}{\tan \theta - \cot \theta}$$

18. Prove that : $(\sec A + \cos A).(\sec A - \cos A) = \tan^2 A + \sin^2 A$ 3

19. Find the mean of the following distribution :   3

Class	0 − 6	6 − 12	12 − 18	18 − 24	24 − 30
Frequency	7	5	10	12	6

20. Find the mode of the following frequency distribution :   3

Marks obtained	10−25	25−40	40−55	55−70	70−85	85−100
No. of students	7	13	30	15	21	10

SECTION-D
Question numbers **21** to **31** carry four marks each.

21. An army group of 308 members is to march behind an army band of 24 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of column in which they can march ?   4

22. If a polynomial $x^4 + 5x^3 + 4x^2 - 10x - 12$ has two zeroes as -2 and -3, then find the other zeroes.   4

23   Solve graphically the following pair of linear equations :
$$2y - 3x = 14$$
$$2x + 3y = 8$$
Hence shade the region enclosed by these lines and y – axis.   4

24   Shanta wants to make a rectangular park for children to play. The area of the park is   4
increased by 75 square units if its length is decreased by 5 units and breadth is increased by 5
units. Its area will be increased by 164 units if its length is increased by 2 units and breadth is
increased by 2 units. Find the dimension of the park. Why it is important for a child to play ?

25   State and prove Basic Proportionality Theorem.   4

26   In two triangles ABC and DEF, if AB, BC and median AX are respectively proportional to DF,   4
EF and median DY, then prove that $\triangle ABC \sim \triangle DEF$.

27   Take $A = 90°$ and $B = 45°$ to verify that :   4
(i) $\sin(A - B) = \sin A \cos B - \cos A \sin B$
(ii) $\cos(A - B) = \cos A \cos B + \sin A \sin B$

28   If $\sec\theta + \tan\theta = p$, show that   4
$$\frac{p^2 - 1}{p^2 + 1} \csc\theta = 1.$$

29   Prove that :   4
$$\left(\frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A} \right) \cdot \left(\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} \right) = 4 \sec A \cdot \csc A$$

30   Ages of employees of an office are given below :   4

Age (in years)	More than or equal to 20	More than or equal to 25	More than or equal to 30	More than or equal to 35	More than or equal to 40	More than or equal to 45	More than or equal to 50	More than or equal to 55	More than or equal to 60
No. of Emplo-yees	200	175	130	119	109	64	28	15	0

Draw a 'more than type' ogive and from it, find median. Verify it by actual calculations.

31   Heights of new born babies in a city hospital are as follows :   4

Height (in cm)	40-42	42-44	44-46	46-48	48-50	50-52	52-54	54-56	56-58
Number of babies	1	4	17	18	x	25	20	6	2

If mode of the data is 51 cm, find the unknown frequency x.

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