34586JI

SUMMATIVE ASSESSMENT – I, 2015-16
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 Two polygons having the same number of sides and corresponding angles equal are similar or not ? 1

2 In a right angled ΔABC, if $\angle B = 90°$, AC = 25 cm and BC = 7 cm, then find tan A. 1

3 If $\sqrt{3}\ \sin\theta = \cos\theta$, find the value of $\frac{3\cos^2\theta + 2\cos\theta}{3\cos\theta + 2}$. 1

4 Find the median class of the following data : 1

Class interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	6	8	10	15	5	4	2

SECTION-B

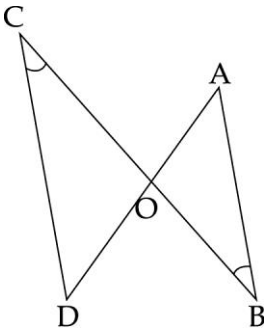
Question numbers **5** to **10** carry two marks each.

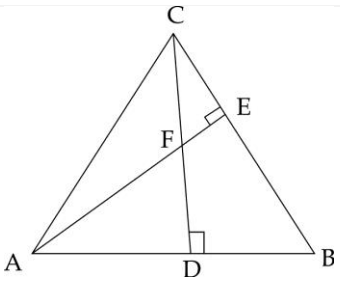
5 Use Euclid's division algorithm to find HCF of 180 and 225. 2

6 Use Euclid division algorithm to find if the following pair of numbers is co - prime : 2

121, 573

7 If the sum of two positive numbers is 44 and one number is three times the other number, 2

	then find the numbers.	
8	In the figure, if $\angle B = \angle C$, prove that $\Delta OAB \sim \Delta ODC$.  	2
9	Find the value of : $\sin 30° . \cos 60° - \tan 45° . \sec 30° . \text{cosec } 60° + 2 . \cot 45°$	2
10	The mode of the following data is 36. Find the missing frequency x in it. <table><tr><td>Class</td><td>0 – 10</td><td>10 – 20</td><td>20 – 30</td><td>30 – 40</td><td>40 – 50</td><td>50 – 60</td><td>60 – 70</td></tr><tr><td>Frequency</td><td>8</td><td>10</td><td>x</td><td>16</td><td>12</td><td>6</td><td>7</td></tr></table>	2
	SECTION-C Question numbers **11** to **20** carry three marks each.	
11	Check whether 14^n can end with the digit zero for any natural number n.	3
12	Find the values of p for which the following pair of linear equations have a unique solution : $(3p+1)x - py + 7 = 0$ $2px + y - 3 = 0$	3
13	Check whether polynomial $3x^2 - 5x + 2$ is a factor of the polynomial $3x^4 - 5x^3 - 10x^2 + 20x - 8$. Verify by division algorithm	3
14	The larger of the two supplementary angles is 46° more than the smaller angle. Find the angles.	3
15	The areas of two similar triangles are 144 cm^2 and 81 cm^2. If median of the first triangle is 16 cm, find the corresponding median of the other.	3
16	In given figure altitudes AE and CD intersect at F	3



prove that

(a) $\Delta FEC \sim \Delta BDC$

(b) $CF.BD = FE.BC$.

17 If $\sin(A+B) = \sin A \cos B + \cos A \sin B$, evaluate $\sin 75°$ 3

18 Prove the identity : $\frac{1+\cot^2\theta}{1-\cos^2\theta} - \operatorname{cosec}^4\theta = 0$. 3

19 In a health check up, the number of heart beats of 40 women were recorded in the following table : 3

Number of heart beats/minute	65-69	70-74	75-79	80-84
Number of women	2	18	16	4

Find the mean of the data.

20 Given below is a cumulative frequency distribution of monthly wages of staff of a hospital : 3

Monthly wages (in ₹)	Below 5000	Below 6000	Below 7000	Below 8000	Below 9000	Below 10000
Number of staff members	0	15	30	38	52	60

Draw a cumulative frequency distribution curve (ogive) 'of less than type' for this data.

SECTION-D

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

21 Show that one and only one out of n, $n+2$, or $n+4$ are divisible by 3, where n is any positive integer. 4

22 Solve following pair of linear equations in x and y. 4

	$(a + b)x + (a - b)y = a^2 + 2ab + b^2$ $(a - b)(x + y) = a^2 + b^2$ If their point of intersection lies on the line given by $y = mx - a$, find the value of m.	
23	If α and β are the zeroes of the polynomial $f(x) = x^2 - 6x + k$, find the value of k, such that $\alpha^2 + \beta^2 = 40$.	4
24	Rehman's mother has given him money to buy some boxes from the market at the rate of $x^2 + 2x - 3$. The total amount of money given by his mother is represented by $4x^4 + 2x^3 - 2x^2 + x - 1$. Out of this money he donated some amount to a child who was studying in the light of street lamp. Find how much amount of money he must have so that he is able to buy exact number of boxes from the market. What can you inculcate in yours life from above incident of Rehman's life ?	4
25	In ΔABC, if $AD \perp BC$ and $AD^2 = BD \times DC$, then prove that $\angle BAC = 90°$.	4
26	State and prove pythagoras theorem. Using the above theorem find the third side of a right triangle whose hypotenuse is of length 'p' cm, one side of length q cm and $p - q = 1$.	4
27	Evaluate tan1° tan2° tan3° … tan89°	4
28	Prove that : $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$	4
29	If $\sin A + \sin^3 A = \cos^2 A$, prove that $\cos^6 A - 4\cos^4 A + 8\cos^2 A = 4$	4
30	Following is the ages of asthmatic patients admitted during a year in a hospital. Find the mean age of the patients. Age (in years) | 0-8 | 8-16 | 16-24 | 24-32 | 32-40 | 40-48 | 48-54 | 54-62 Number of patients | 6 | 25 | 12 | 13 | 11 | 14 | 11 | 8	4
31	The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequencies f_1 and f_2 : Class interval | $0-20$ | $20-40$ | $40-60$ | $60-80$ | $80-100$ | $100-120$ | Total Frequency | 5 | f_1 | 10 | f_2 | 7 | 8 | 50	4
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