Class intervals	Frequency
20–30	10
30–40	8
40–50	12
50–60	24
60–70	6
70–80	25
80–90	15

30. Prove:

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

31. Use Euclid's Algorithm to find the HCF of 4052 and 12576.

ZZ-DRO-103

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SUMMATIVE ASSESSMENT-I- 2016-17

SUBJECT – MATHEMATICS

CLASS- X

3:00Hrs **M.M:90**

eral Instructions:

All questions are compulsory.

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.

Use of calculator is **not** permitted.

An additional 15 minutes has been allotted to read this question paper only.

SECTION - A

1. If HCF of a and b is 12 and product of these numbers is 1800. Then what is LCM of these numbers?

2. In ΔABC, $AB = 6\sqrt{3}$ cm, $AC = 12$cm, and $BC = 6$cm.

   Find angle B.

3. Check whether the pair of linear equations are consistent, or inconsistent.

[P.T.O.]

$2x - 3y = 8$; $4x - 6y = 9$

4. Find f and F.

Marks	Number of students (frequency)	c.f.
0 – 10	5	5
10 – 30	15	F
30 – 60	f	50
60 – 80	8	58
80 – 90	2	60
	N = 60	

SECTION - B

5. If $\sin 3A = \cos(A - 26^0)$, where 3A is an acute angle, find the value of A.

6. $\Delta ABC \sim \Delta DEF$ and their areas be respectively $64cm^2$ and $121cm^2$ If EF = 15.4cm, find BC.

7. Solve it by substitution method :

$$0.2x + 0.3y = 1.3$$
$$0.4x + 0.5y = 2.3$$

8. Find the zeroes of the polynomial $x^2 + 7x + 10$.

9. Prove that

$$\left(1 + \frac{1}{\tan^2 A}\right)\left(1 + \frac{1}{\cot^2 A}\right) = \frac{1}{\left(\sin^2 A - \sin^4 A\right)}$$

[P.T.O.]

10. Calculate the mode for the following frequency distribution.

Class	Frequency
25 – 30	25
30 – 35	34
35 – 40	50
40 – 45	42
45 – 50	38
50 – 55	14

SECTION - C

11. Show that any positive odd integer is of the form $(4q+1)$ or $(4q+3)$, where q is a positive integer.

12. Find the Quotient and remainder on dividing

$(8x^4 + 14x^3 - 2x^2 + 8x - 12)$ by $(4x^2 + 3x - 2)$.

13. For what values of k will the following pair of linear equations have infinitely many solutions?

$kx + 3y - (k-3) = 0$; $12x + ky - k = 0$.

14. Prove that $5 - \sqrt{3}$ is irrational.

15. Given, $15\cot A = 8$, find $\sin A$ and $\sec A$.

16. ABCD is a trapezium with $AB \parallel DC$. E and F are points on non-parallel sides AD and BC respectively such that EF is parallel to AB. Show that $\frac{AE}{ED} = \frac{BF}{FC}$.

[P.T.O.]

17. If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$, $0° < A + B < 90°$, $A > B$, find A and B.

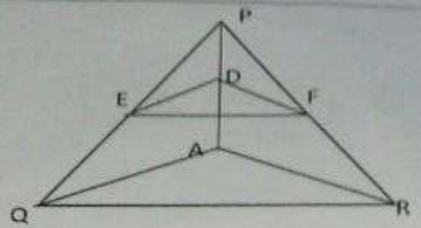
18. Find the missing frequencies x, y for the following distribution if the mean is 1.46.

Number of accidents	Frequency (number of days)
0	46
1	x
2	y
3	25
4	10
5	5
Total	200

19. Calculate arithmetic mean of following distribution:

Class intervals	Frequency
10 – 30	5
30 – 50	8
50 – 70	12
70 – 90	20
90 – 110	3
110 – 130	2

20. In figure,



DE || AQ and DF || AR. Prove that EF || QR.

For visually impaired

State and prove basic proportionality theorem.

SECTION - D

21. In a right triangle, prove that the square of the hypotenuse is equal to the sum of the squares of the other two sides.

22. Prove that

$$\frac{\tan A+\sec A-1}{\tan A-\sec A+1}=\frac{1+\sin A}{\cos A}.$$

23. The following table gives the marks obtained by 80 students in a selection test:

Marks	Number of students
Below 10	3
Below 20	12
Below 30	27
Below 40	57
Below 50	75
Below 60	80

Find median marks.

24. Find other zeroes of $2x^4 - 9x^3 + 5x^2 + 3x - 1$, if two of its zeroes are $2+\sqrt{3}$ and $2-\sqrt{3}$

25. Prove that

$$\sin 45^0 = \frac{1}{\sqrt{2}}.$$

26. Solve graphically :

$$X + 3Y - 6 = 0 \quad \text{and}$$
$$2X - 3Y - 12 = 0$$

27. A group consists of honest and extremely kind people. If 8 honest people and 12 extremely kind people can finish a piece if work in 10 days while 6 honest people and 8 extremely kind people can finish it in 14 days then find the time taken by one honest people alone and that by extremely kind people alone to finish the work, which of the above values you prefer more?

28. Diagonals of a trapezium ABCD with $AB \| DC$ intersect each other at the point O. If $AB = 2CD$, find the ratio of the areas of triangles AOB and COD.

29. Draw 'less than ogive' and 'more than ogive' for the following distribution and hence find median.