

SUMMATIVE ASSESSMENT-I, 2013

MATHEMATICS

Time : 3 hrs.

251013

M.M. : 90

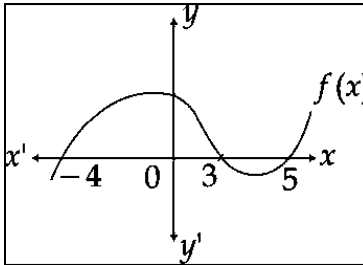
General instructions :

- All questions are **compulsory**
- The question paper consists of **34** questions divided into four **sections A, B, C and D. Section-A** comprises of **8** multiple choice 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 **10** questions of **4 marks** each.
- Use graph paper for Q. 18.
- There is no overall choice in this question paper.
- Use of calculator is not permitted.

SECTION – A

Question numbers 1 to 8 carry 1 mark each.

- Q.1** If p and q are two co-prime numbers, then HCF (p , q) is :
(a) p (b) q (c) pq (d) 1
- Q.2** If $a=(2^2 \times 3^3 \times 5^4)$ and $b=(2^3 \times 3^2 \times 5)$, then HCF (a , b) is equal to :
(a) 900 (b) 180 (c) 360 (d) 540
- Q.3** In the given figure, the number of zeroes of the polynomial $f(x)$ are :



- (a) 1 (b) 2 (c) 3 (d) 4
- Q.4** The pair of equations $y = 0$ and $y = -5$ has.
(a) One solution (b) Two solutions
(c) Infinitely many solutions (d) No solution
- Q.5** The famous mathematician who gave an important truth called ‘Basic proportionality theorem’ belongs to :
(a) China (b) India (c) Babylonia (d) Greece
- Q.6** The value of $\sin^2 30^\circ - \cos^2 30^\circ + \tan^2 45^\circ$ is :
(a) $\frac{-1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) 0
- Q.7** The value of $\cot 10^\circ \cot 15^\circ \cot 75^\circ \cot 80^\circ$ is equal to :
(a) 0 (b) -1 (c) 1 (d) cannot be determined
- Q.8** If the ‘less than’ type ogive and ‘more than’ type ogive intersect each other at $(20.5, 15.5)$, then the median of the given data is :
(a) 36.0 (b) 20.5 (c) 15.5 (d) 5.5

SECTION – B

Question numbers 9 to 14 carry 2 marks each.

- Q.9** What can you say about the prime factorisation of the denominator of the rational number 0.134 when written in the form $\frac{p}{q}$. Is it of the form $2^m \times 5^n$? If yes, write the values of m and n .
- Q.10** Form a quadratic polynomial whose zeroes are $\frac{3-\sqrt{3}}{5}$ and $\frac{3+\sqrt{3}}{5}$.
- Q.11** For what value of c , the pair of equations $x - 4y = 2$ and $3x + cy = 10$ has no solution?
- Q.12** In $\triangle ABC$, $\angle A = 90^\circ$, $AN \perp BC$, $BC = 13$ cm and $AC = 5$ cm.
Find the ratio $\text{ar}(\triangle NAC) : \text{ar}(\triangle ABC)$.
- Q.13** If $\sin\theta - \cos\theta = \frac{1}{2}$, then find the value of $\sin\theta + \cos\theta$.
- Q.14** The following are the ages of 300 patients getting medical treatment in a hospital on a particular day :

Age (in years)	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Number of patients	60	42	55	70	53	20

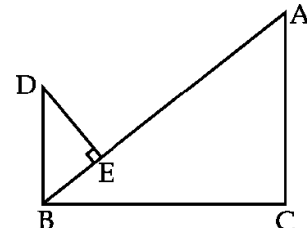
Form 'less than type' cumulative frequency distribution.

SECTION - C

Question numbers 15 to 24 carry 3 marks each.

- Q.15** Find HCF and LCM of 180, 252 and 324.
- Q.16** If two zeroes of the polynomial $x^3 - 4x^2 - 3x + 12$ are $\sqrt{3}$ and $-\sqrt{3}$, find all the zeroes of the polynomial.
- Q.17** Solve for x and y $\frac{5}{x-1} + \frac{1}{y-2} = 2$; $\frac{6}{x-1} - \frac{3}{y-2} = 1$; $\begin{bmatrix} x \neq 1 \\ y \neq 2 \end{bmatrix}$.
- Q.18** Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Write the co-ordinates of the vertices of the triangle formed by these lines and the x -axis and shade the corresponding triangular region.

- Q.19** In the given figure, $DB \perp BC$; $DE \perp AB$ and $AC \perp BC$.
Prove that $\frac{BE}{DE} = \frac{AC}{BC}$.



- Q.20** In an equilateral triangle ABC , AD is an altitude drawn from A on the side BC . Prove that $\frac{3}{4}AB^2 = AD^2$.
- Q.21** If $\tan\theta + \frac{1}{\tan\theta} = \sqrt{2}$, find the value of $\tan^2\theta + \frac{1}{\tan^2\theta}$.
- Q.22** Prove that: $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta} + \frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{2}{2\sin^2\theta - 1}$

Q.23 Find the median of the following data :

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Number of students	5	15	25	20	7	8	10

Q.24 Find the mean of the following data :

Classes	5-15	15-25	25-35	35-45	45-55	55-65	65-75
Frequency	6	10	16	15	24	8	7

SECTION – D

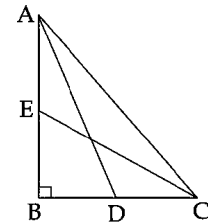
Question numbers 25 to 34 carry 4 marks each.

Q.25 For a morning walk, three persons steps off together. Their steps measure 80cm, 85cm and 90cm respectively. What is the minimum distance each should walk to show that they can cover the distance in complete steps? Which value is preferred in this situation?

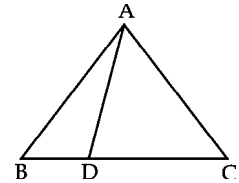
Q.26 Geeta scored 40 marks in a test, getting three marks for each right answer and losing one mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Geeta would have scored 50 marks. How many questions were there in the test? What lesson can be got from these situations?

Q.27 Obtain all the zeroes of the polynomial $x^4 - 2x^3 - 7x^2 - 8x + 12$, if two of its zeroes are 2 and -2.

Q.28 In the figure, ABC is a right triangle, right angled at B. AD and CE are two medians drawn from A and C respectively. If AC = 5 cm and $AD = \frac{3\sqrt{5}}{2}$ cm, find the length of CE.



Q.29 In the given figure ΔABC is equilateral. D is a point on BC such that $BD = \frac{1}{3} BC$. Prove that $9AD^2 = 7AB^2$.



Q.30 If $x = r \sin\theta \cos\alpha$, $y = r \sin\theta \sin\alpha$ and $z = r \cos\theta$. Prove that $x^2 + y^2 + z^2 = r^2$

Q.31 Find the value of : $\frac{\sin 62^\circ}{\cos 28^\circ} + \frac{3 \tan 73^\circ}{\cot 17^\circ} - \frac{5 \sin 28^\circ \sec 62^\circ}{7 \sec^2 32^\circ - 7 \cot^2 58^\circ}$.

Q.32 If $1 + \sin^2\theta = 3 \sin\theta \cos\theta$, then show that $\tan\theta = 1$ or $\frac{1}{2}$.

Q.33 Find mode of the following data :

Classes	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3

Q.34 The mean of the following data is 42. Find the missing frequencies x and y if the total frequency is 100 :

Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	7	10	x	13	y	10	14	9

