



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 10 question of 1 mark each. Section – B comprises of 8 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 6 questions of 4 marks each.
- Question numbers 1 to 10 in Sections – A are multiple choice questions where you are to select one correct option out of the given four.
- There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four mark each. You have to attempt only one If the alternatives in all such questions.
- Use of calculator is not permitted.

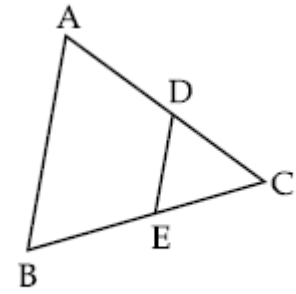
SET 'S' CLASS X_ 2011-2012 (SA-1)

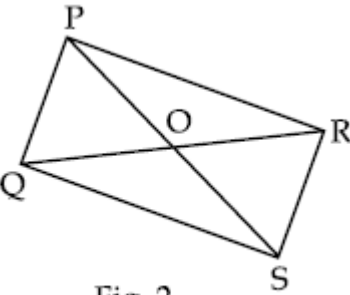
Time : 3 Hours 15 Minutes

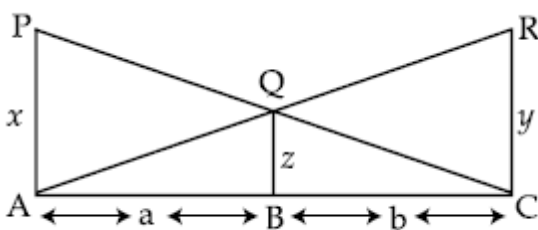
Maximum Marks : 80

SECTION A

Q.1	If $\sin \theta = \frac{1}{2}$, then the value of $\sin \theta(\sin \theta - \operatorname{cosec} \theta)$ is : (a) $\frac{3}{4}$ (b) $-\frac{3}{4}$ (c) $\frac{\sqrt{3}}{2}$ (d) $-\frac{\sqrt{3}}{2}$
Q.2	If -4 is a zero of the polynomial $x^2 - x - (2 + 2k)$ then the value of k is (a) 3 (b) 9 (c) 6 (d) -9
Q.3	The relation connecting the measures of central tendencies is (A) Mode = 2 Median - 3 Mean (B) Mode = 3 Median - 2 Mean (C) Mode = 2 Median + 3 Mean (D) Mode = 3 Median + 2 Mean
Q.4	The value of $\sin^2 30^\circ + \cos^2 45^\circ + \cos^2 30^\circ$ is : (a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{3}{2}$ (d) $\frac{2}{3}$
Q.5	$(\sqrt{2} - \sqrt{3})(\sqrt{3} + \sqrt{2})$ is (A) A rational number (B) A whole number (C) An irrational number (D) A natural number
Q.6	Which of the following are not the sides of a right triangle (A) 9 cm, 15 cm, 12 cm (B) 2 cm, 1cm, $\sqrt{5}$ cm (C) 400 mm, 300 mm, 500 mm (D) 9 cm, 5 cm, 7 cm

Q.7	Expressing $\sin A$ in terms of $\cot A$ is (a) $\frac{\sqrt{1+\cot^2 A}}{\cot A}$ (b) $\sqrt{\frac{1+\cot^2 A}{\cot A}}$ (c) $\frac{1}{\sqrt{1+\cot^2 A}}$ (d) $\frac{\sqrt{1-\cot^2 A}}{\cot A}$
Q.8	The quadratic polynomial $p(y)$ with -15 and -7 as sum and one of the zeroes respectively is (a) $y^2 - 15y - 56$ (b) $x^2 + 15x + 56$ (c) $y^2 + 15y + 56$ (d) $y^2 + 15y - 56$
Q.9	If $\tan 2A = \cot(A - 18^\circ)$ then the value of A is (a) 18° (b) 36° (c) 24° (d) 27°
Q.10	The pair of linear equations $2x - 3y = 5$ and $-6y + 4x - 10 = 0$ have (A) Two solutions (B) One solution (C) No solution (D) Many solutions
SECTION B	
Q.11	Without actually performing the long division , state whether the following number has a terminating decimal expansion or non terminating recurring decimal expansion $\frac{543}{225}$.
Q.12	In fig.1, if $\angle A = \angle B$ and $AD = BE$ show that $DE \parallel AB$ in ΔABC .  Fig. 1
Q.13	Prove that $1 + \frac{\cot^2 \theta}{1 + \operatorname{cosec} \theta} = \frac{1}{\sin \theta}$
Q.14	Find a quadratic polynomial , the sum of whose zeroes is 7 and their product is 12. Hence find the zeroes of the polynomial. OR Find a quadratic polynomial whose zeroes are 2 and - 6. Verify the relation between the coefficients and zeroes of the polynomial.

Q.15	Write the frequency distribution table for the following data :						
	Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
	No. of students	0	12	20	28	33	40
Q.16	In fig 2, PQR and SQR are two triangles on the same base QR. If PS intersect QR at O then show that						
	 <p style="text-align: center;">Fig. 2</p> $\frac{ar(PQR)}{ar(SQR)} = \frac{PO}{SO}$						
Q.17	For what value of k, the following system of linear equations have no solution. $3x + y = 1$; $(2k - 1)x + (k - 1)y = 2k + 1$						
Q.18	Find the mode of the following data						
	Class	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	
	Frequency	7	12	20	11	8	
SECTION C							
Q.19	Prove that $\sqrt{5}$ is an irrational number.						
	OR						
Q.20	Prove that $4 - 5\sqrt{3}$ is an irrational.						
	Divide $(6 + 19x + x^2 - 6x^3)$ by $(2 + 5x - 3x^2)$ and verify the division algorithm.						
Q.21	Prove that $(\operatorname{cosec} A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$.						
Q.22	Find the median of the following data						

	Class Interval	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75
	Frequency	2	3	8	6	6	3	2
Q.23	In an equilateral triangle ABC, D is a point on side BC such that $3BD = BC$. Prove that $9AD^2 = 7AB^2$							
Q.24	A boat goes 24 km up stream and 28 km down stream in 6 hours. It goes 30 km up stream and 21 km down stream in 6 hours 30 minutes. Find the speed of the boat in still water.							
	OR							
Q.25	A person travels 600 km partly by train and partly by car. If he covers 400 km by train and the rest by car, it takes 6 hours 30 minutes. But if he travels 200 km by train and the rest by car, he takes half an hour longer. Find the speed of the car and that of the train.							
	In Fig 3, PA, QB and RC are perpendiculars to AC. Prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$							
	 <p style="text-align: center;">Fig. 3</p>							
Q.26	Show that any positive odd integer is of the form $6p + 1, 6p + 3$ or $6p + 5$ where p is some integer.							
Q.27	Find the mean of the following data using step deviation method.							
	Class Intervals	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
	Frequency	4	4	7	10	12	8	5
OR								
The Arithmetic mean of the following frequency distribution is 53. Find the value of p.								

	<table border="1"> <tr> <td>Class</td> <td>0 - 20</td> <td>20 - 40</td> <td>40 - 60</td> <td>60 - 80</td> <td>80 - 100</td> </tr> <tr> <td>Frequency</td> <td>12</td> <td>15</td> <td>32</td> <td>p</td> <td>13</td> </tr> </table>	Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	Frequency	12	15	32	p	13				
Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100												
Frequency	12	15	32	p	13												
Q.28	Evaluate : $\frac{\operatorname{cosec}^2(90^\circ - \theta) - \tan^2 \theta}{4(\cos^2 48^\circ + \cos^2 42^\circ)} - \frac{2 \tan^2 30^\circ \sec^2 52^\circ \sin^2 38^\circ}{\operatorname{cosec}^2 70^\circ - \tan^2 20^\circ}$.																
	SECTION D																
Q.29	Obtain all the zeroes of $x^4 - 7x^3 + 17x^2 - 17x + 6$ if two of its zeroes are 1 and 2.																
Q.30	Show that $q(p^2 - 1) = 2p$, if $\sin \theta + \cos \theta = p$ and $\sec \theta + \operatorname{cosec} \theta = q$.																
Q.31	State and prove basic proportionality theorem. OR Prove that in a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.																
Q.32	Solve graphically $4x - y = 4$ and $4x + y = 12$, shade the triangular region formed by these lines and x-axis. Also, write the coordinate of the vertices of the triangle formed by these line and x-axis.																
Q.33	Prove that $\frac{1 + \cos \theta + \sin \theta}{1 + \cos \theta - \sin \theta} = \frac{1 + \sin \theta}{\cos \theta}$. OR Without using trigonometric tables, evaluate $\frac{\operatorname{cosec}^2(90^\circ - \theta) - \tan^2 \theta}{4(\cos^2 48^\circ + \cos^2 42^\circ)} - \frac{2 \tan^2 30^\circ \sec^2 52^\circ \sin^2 38^\circ}{\tan^2 20^\circ - \operatorname{cosec}^2 70^\circ}$.																
Q.34	Change the following data into less than type distribution and draw its ogive. Hence find the median of the data.																
	<table border="1"> <tr> <td>Marks</td> <td>30 - 39</td> <td>40 - 49</td> <td>50 - 59</td> <td>60 - 69</td> <td>70 - 79</td> <td>80 - 89</td> <td>90 - 99</td> </tr> <tr> <td>No. of students</td> <td>5</td> <td>7</td> <td>8</td> <td>10</td> <td>5</td> <td>8</td> <td>7</td> </tr> </table>	Marks	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89	90 - 99	No. of students	5	7	8	10	5	8	7
Marks	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89	90 - 99										
No. of students	5	7	8	10	5	8	7										
	_____X_____																
	<i>"CONFIDENCE IS THE COMPANION OF SUCCESS"</i>																