Akash Nagpal
Red Roses Public School

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X-B
248SKVM 22

SUMMATIVE ASSESSMENT – I, 2014
MATHEMATICS
Class – X

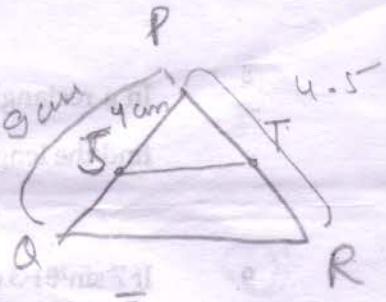
Time Allowed: 3 hours **Maximum Marks: 90**

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 In ΔPQR, S and T are points on the sides PQ and PR respectively such that ST // QR. If PS = 4 cm, PQ = 9 cm and PR = 4.5 cm, then find PT. 1

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

3 Find the value of $\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$. 1

4 If the class marks of a continuous frequency distribution are 12, 14, 16, 18, 20, 22, then find the class intervals corresponding to the class marks 16 and 22. 1

SECTION-B

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

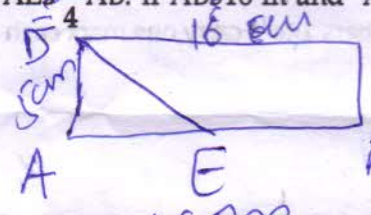
5 Show that 14^n cannot end with digit zero for any natural number n. 2

6 Find the prime factorisation of the denominator of the rational number equivalent to 1.033. 2

7 Given the linear equation ~~9x52y15~~, write another linear equation in these two variables, such that the geometrical representation of the pair so formed is : 2

(i) intersecting lines (ii) parallel lines

8 In a rectangle ABCD, E is a point on AB such that AE = $\frac{3}{4}$ AB. If AB = 16 m and AD = 5 m, then find the length of DE. 2



9 If $7 \sin^2\theta - 3 \cos^2\theta = 4$, then find the value of $\tan\theta$.

10 Data of 'missed catches' for the 40 matches played by a player is as follows :

Number of missed catches in a match	0-3	3-6	6-9	9-12	12-15
Number of matches	15	16	3	4	2

Calculate the average number of catches missed by him.

SECTION-C

Question numbers **11** to **20** carry three marks each.

11 Find the HCF of numbers 72 and 96 by Euclid's division algorithm and express it in the form 96m172n, where m and n are integers. 3

12 If one zero of the polynomial (a15) x^2 113x16a is reciprocal of the other, find the value of a. 3

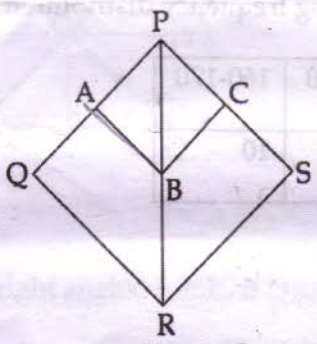
13 On dividing x^4 2x^3 23x^2 13x12 by a polynomial g(x), the quotient and the remainder were x^2 2x22 and 2x respectively. Find g(x). 3

14 Solve for x and y: 3

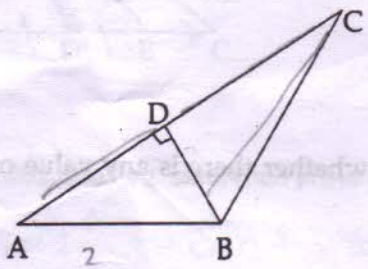
x12y2350

3x22y1750

15 In figure AB??QR and BC??RS. Prove that $\frac{PA}{PQ} = \frac{PC}{PS}$ 3



16 In the figure ABC is a triangle and BD ⊥ AC. Prove that AB^2 1CD^2 5AD^2 1BC^2 3



17 Evaluate : 3

$$\frac{\sin 25^\circ}{\cos 65^\circ} + \frac{\operatorname{cosec} 34^\circ}{\sec 56^\circ} - \frac{2\cos 43^\circ \operatorname{cosec} 47^\circ}{\tan 10^\circ \cdot \tan 40^\circ \cdot \tan 50^\circ \cdot \tan 80^\circ}$$

18 If $7\sin^2\upsilon 13\cos^2\upsilon 54$, find the value of $\sec\upsilon 1 \operatorname{cosec}\upsilon$ 3

19 The following observations are about the heights of 800 persons. Draw a 'less than type' ogive for the data : 3

Height (in cm)	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175
Number of persons	50	70	80	150	170	100	95	85

20 In a school, IQ of 250 students of class X is given in the following frequency distribution : 3

IQ	120-130	130-140	140-150	150-160	160-170
Number of students	10	80	100	50	10

Find the mean IQ of students.

SECTION-D

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

21 State fundamental theorem of Arithmetic. Using it check whether there is any value of n for which 5^n ends with the digit zero. 4

22 The owner of a taxi company decides to run all the taxi on CNG fuels instead of petrol/diesel. The taxi charges in city comprises of fixed charges together with the charge for the distance covered. For a journey of 12 km, the charge paid is ` 89 and for journey of 20 km, the charge paid is ` 145. 4

(i) What will a person have to pay for travelling a distance of 30 km ?

(ii) Why did he decide to use CNG for his taxi as a fuel ?

23 Obtain all other zeroes of the polynomial $x^4 16x^3 12x^2 221x 230$, if two of its zeroes are ~~12 and 25~~. 4

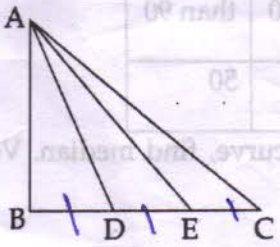
$2x^4 - 3x^3 - 3x^2 + 6x - 2$ $(\sqrt{2}, -\sqrt{2})$

24 Pocket money of Zahira and Zohra are in the ratio 6 : 5 and the ratio of their expenditures are in the ratio 4 : 3. If each of them saves ` 50 at the end of the month, find their pocket money. 4

25 ~~ΔPQR is right angled Δ at Q. QX⊥PR, XY⊥RQ and XZ⊥PQ are drawn. Prove that~~ 4
~~$XZ^2 5 PZ 3 ZQ$.~~

Q Define Pythagoras theorem and prove it?

26 In right angled ΔABC if D and E trisect BC, then prove that $8\,AE^2 53\,AC^2 15\,AD^2$. 4



Q $8AE^2 = 3AC^2 + 5AD^2$

27 If $\cos\upsilon 2 \sin\upsilon 5 \sqrt{2} \sin\upsilon$, then prove that $\cos\upsilon 1 \sin\upsilon 5 \sqrt{2} \cos\upsilon$ 4

If $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$ then prove $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$.

28 If υ5308, verify the following : 4

(i) $\cos 3\upsilon 5 4\cos^3\upsilon 2 3\cos\upsilon$

(ii) $\sin 3\upsilon 5 3\sin\upsilon 2 4\sin^3\upsilon$

29 If $\sec\upsilon 2 \tan\upsilon 5x$, show that $\sec\upsilon 1 \tan\upsilon 5 \frac{1}{x}$ and hence find the values of $\cos\upsilon$ and $\sin\upsilon$ 4

30 In a certain locality, monthly consumptions of electricity (in units) of 122 families are given in the following table. 4

If mode is given to be 139, find the missing frequencies x and y.

Electricity consumed (in units)	70-90	90-110	110-130	130-150	150-170	170-190	190-210	210-230
Number of families	x	10	y	40	18	9	8	3

31 The following table gives production yield per hectare of rice in 50 farms of a state : 4

Yield (in kg/ha)	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	Less than 90
Number of farms	1	5	11	23	42	50

Draw a 'less than type' ogive for the distribution and from the curve, find median. Verify median by actual calculations.

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