St. Thomas' School, Sunari, Agra
Half yearly Examination (2024-25)
Class: VIII
Subject: MATHEMATICS SPECIMEN PAPER

M.Time: 2 h 30 min.   **MM:80**

Name: _____   **Roll no.: _____**

Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during first 15 minutes.
This time is to be spent in reading the question paper.
The time given at the head of this Paper is the time allowed for writing the answers
Attempt all questions from Section A and any four questions from Section B.
All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.
The intended marks for questions or parts of questions are given in brackets [ ]

Section- A
(Attempt all questions from this sections)

Question 1
Choose the correct answers to the questions from the given options: **[15]**
(Do not copy the question, write the correct answers only.)

(i) A number is an irrational number if and only if its decimal representation is:
  (a) terminating   (c) non terminating and non-repeating
  (b)non terminating   (d) non terminating and repeating

(ii) The compound interest on ₹5000 at 10% p.a compounded annually for 2 years is?
  (a) ₹ 950   (c) ₹1050
  (b) ₹1150   (d) ₹1250

(iii) The coefficient of x^2 in the expansion of (4-3x)(3-2x) is
  (a) -6   (c) 6
  (b) -12   (d) 12

(iv) One of the factors $2x^2-x-6$ is
  (a) (x+2)   (c) (2x+3)
(b) (2x-3)   (d)(x-6)

(v) Which ordered pair is a solution of the system: 2x -y= -2 , 1/3y =x ?
  (a) (0,2)   (c) (2,6)
  (b) (1,3)   (d) (3,8)

(vi) If $2^x . 5^y . 7^z = 98 \times 10^3$, the value of x+y+z is:
  (a) 6   (c) 7
(b) 8   (d) 9

(vii) The point of concurrence of three medians of a triangle is known as:
  (a) Circumcentre   (c) incentre
(b) orthocentre   (d) centroid

(viii) In ΔABC, AB=BC and ∠B= 80°. Then ∠A is equal to
  (a) 40°   (c) 50°
(b) 80°   (d) 100°

(ix) In ΔABC, ∠C=∠A, BC=4cm and AC= 5 cm. Then the length of AB is :
  (a) 6 cm   (c) 5 cm
(b) 4.5 cm   (d) 4 cm

(x)If x,y,z are the lengths of the sides of a triangle :   (b) x-y>z
  (a)x+y>z

(c) x+y<z   (d) z>x+y

(xi) In△ABC, D and E are the mid-points of AB and AC. If DE=7.5cm, then the length of BC is
    (a) 15 cm   (c) 12.5 cm
(b) 10 cm   (d) 7.5 cm
(xii)If the sides of rectangular plot are 15m and 8m, then the length of diagonal is:
(a) 17cm   (c) 17m
    (b) 21m   (d) 23m
(xiii) A quadrilateral ABCD is a trapezium if
    (a) AD=BC   (c) AB=DC
(b) $\angle A + \angle C = 180°$ (d) $\angle B + \angle C = 180°$
(xiv) If the interior angle of regular polygon is 165° then the number of sides in it are
    (a) 18   (c) 24
(b) 30   (d) 12
(xv) Which of the following is undefined?
    (a) $-25^{1/2}$ (c) $25^{1/2}$
(b) $-65^{1/2}$ (d) $(-25)^{1/2}$

Question 2
(i) Neha invested certain amount of money in two schemes A and B which offered interest at the rate of 8% and 9% per annum respectively. She earned ₹1,860 as interest. If she had interchanged the amount invested in two schemes, she would have received ₹ 20 more as annual interest. Find out how much she invested in each scheme.[4]
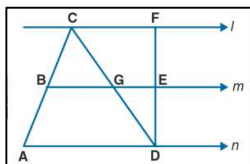
(ii) In the given figure, C is mid point AB, $\angle BAD = \angle CBE$ and $\angle ECA = \angle DCB$. Prove that:[4]
    (a)△DAC $\cong$ △EBC (b) DA=EB
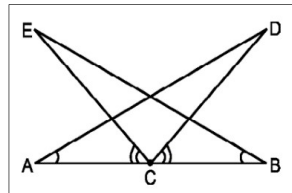
(iii) In the given figure, the lines l, m and n are parallel to each other and G is mid point of CD. [4]
Calculate:
(a) BG if AD= 6cm   (b) CF if GE=2.5 (c) AB if BC= 3cm (d) ED if FD=5.4cm

Question 3
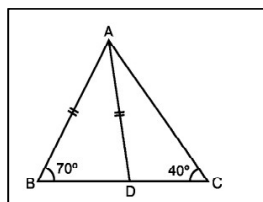(i) Construct a trapezium ABCD, when AB=5cm, BC=6.5cm, CD=5.5cm,∠B=60° and AD∥BC[4]
(ii) In the given figure, prove that AB > DC   [4]

(iii) In a parallelogram ABCD, E and F are the mid-points of sides AB and CD, respectively (see figure). Show that the line segments AF and EC trisect the diagonal BD[5]

Section- B
(Attempt any four questions)

Question 4

(i) If $x = \frac{3+\sqrt{7}}{2}$ find the value of $4x^2 + \frac{1}{x^2}$ [3]

(ii) Rahul invests a certain sum of money at 20% per annum compounded yearly. Pranav invests exact that sum at the same rate of interest per annum compounded half yearly. If Pranav gets ₹ 33 more than Rahul in one and half years. Find out the sum invested. [3]

(iii) If 3a+5b+4c=0, show that $27a^3 + 125b^3 + 64c^3 = 180abc$ [4]

Question 5

(i) if $a - \frac{1}{a} = 5$, find the values of: [3]

   (a) $a^2 - \frac{1}{a^2}$ (b) $a^4 + \frac{1}{a^4}$ (c) $a^3 - \frac{1}{a^3}$

(ii) find the length and breadth of the rectangle whose area is $15x^2 - 38x + 24$ [3]

(iii) A train covered a certain distance at a uniform speed. If the train had been 30km/h faster, It would have taken 2 hours less than scheduled time. If the train was slower by 15km/h, It would have taken 2 hours more than the scheduled time. Find the length of journey.[4]

Question 6

(i) Simplify the following [3]
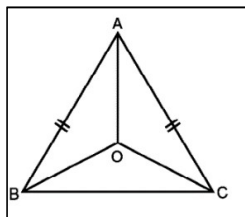
(a) $\frac{3x^5y^4}{15x^2y^2}$ (b) $(x^5)^{-3/5} \times (y^{5/3})^{-3/4}$ (c) $(64x^3 \div 125y^{-3})^{2/3}$

(ii) Find x if:

   $\log_7(2x^2-3)=2$ (b) $\log_x 16 = 2$ (c) $\log_{10}x=3$ [3]

(iii). In the given figure in ΔABC, AB=AC, the bisectors of∠B intersect each other at O. show that:

   (a) OB=OC (ii) OA bisects ∠A [4]

Question 7

(i) The population of town increases at a rate of 1% for first year, it decreases at the rate of 2% for the second year and for third year it again increased at the rate of 3% . Then what will be the population after 3 years if the present population of the town is 4,50,000?[5]

(ii) prove that $(x+y)^3 + (y+z)^3 + (z+x)^3 - 3(x+y)(y+z)(z+x) = 2[(x^3+y^3+z^3)-3xyz]$[5]

Question 8

(i) The difference between two positive numbers is 4 and the difference between their cubes is 316, find the sum of their squares [3]

(ii) In ΔABC, ∠B=35⁰, ∠C=35⁰ and the bisector of ∠BAC meets BC in P. Arrange AB, BP and CP IN descending order. [3]

(iii) factorise: [4]

   (a) $3x^2y - 3xy + 12x - 12$
   (b) $125a^3 - 216b^3$
   (c) $\frac{27x^3}{125} - \frac{1}{8}y^3$

   (d) $x^2 + \frac{1}{x^2} - 27$