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**8**

THIRD EDITION

A Comprehensive Mathematics  
Series for Grade 8

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Papers**

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# Model Paper I

## Mid-Year Examination

### Mathematics

### Class VIII

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Date: \_\_\_\_\_

Time: 2 Hours

Maximum Marks: 100

#### Read these instructions first:

- Write your name, section, and date clearly in the space provided.
- Answer all questions in Section A, Section B, and Section C.
- Show all your working along with the answer in the space provided.
- Omission of essential working will result in loss of marks.
- At the end of the examination, recheck your work before handing it over.
- The number of marks is given in brackets [ ] at the end of each question.
- This document consists of 12 printed pages.

\_\_\_\_\_ For Examiner's Use Only \_\_\_\_\_

Section	A	B					C					Total
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	
<b>Max. Marks</b>	20	6	6	6	6	6	10	10	10	10	10	100
<b>Marks Obtained</b>												
<b>Percentage</b>												

Invigilated by: \_\_\_\_\_ Marked by: \_\_\_\_\_ Checked by: \_\_\_\_\_

## Section A

Attempt all questions

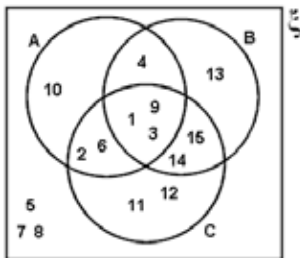
[20 Marks]

Q1. Each question has four options. Encircle the correct answer.

I. If A is a set of first 5 odd numbers and B is a set of first five prime numbers, then which one of the following shows  $A \cap B$ ?

- A. {1, 2, 3, 4, 5}
- B. {1, 3, 5}
- C. {3, 5, 7}
- D. {1, 5, 7, 9, 11}

II. Which of the following is the correct set description for  $A \cup B \cup C$ ?



- A. {1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15}
- B. {{1, 2, 3, 4, 6, 9, 14, 15}}
- C. {1, 3, 9}
- D. {1, 3, 4, 9}

III. Which one of the following is an irrational number?

- A.  $35\pi$
- B. Square root of 196
- C. 0.4343434343...
- D. 0

IV. What is the Square root of  $\frac{36}{100}$  ?

- A. 0.36
- B. 0.06
- C. 0.6
- D. 0.036

V. What is the simplest form of  $\sqrt{20}$  ?

- A.  $2\sqrt{2 \times 10}$
- B.  $2\sqrt{4 \times 5}$
- C. 40
- D.  $4\sqrt{5}$

VI. Ayesha has multiple packs of number digit cards.

If she is asked to show the square root of a 9 digits perfect square number using her cards how many cards will she display? [Hint: number of digits in square root of a 9 digit number]

- A. 2
- B. 3
- C. 4
- D. 5

VII. Which of the following statements is **WRONG**?

- A. The cube of a negative number is negative.
- B. The square of negative number is positive.
- C. The cube of an even number is even.
- D. All above three options are incorrect.

VIII. Which one is the exponent form of  $\frac{8}{27}$  ?

- A.  $\left(\frac{3}{2}\right)^2$
- B.  $\left(\frac{2}{3}\right)^3$
- C.  $\left(\frac{2}{3}\right)^{-3}$
- D.  $\left(\frac{-2}{3}\right)^2$

IX. What is the average speed of a bus that travels 350 km in 5 hours?

- A. 1750 km/h
- B. 70 km/h
- C. 175 m/h
- D. 70 m/h

X. What is the value of  $(4^2)^0$  ?

- A. 0
- B. 16
- C. 1
- D. None of the above

XI. Babar buys a watch at a discount of Rs 2000. What is the discount percentage of the watch if its marked price is Rs 4000?

- A. 12.5%
- B. 50%
- C. 12%
- D. 11.5%

XII. If a person's annual salary is Rs 200000 then how much income tax does he pay at the rate of 5%?

- A. Rs 40000
- B. Rs 10000

- C. Rs 4000
- D. Rs 100000

**XIII.** Which of the following is not used to withdraw amount from a bank account?

- A. Pay order
- B. Demand draft
- C. Cheque
- D. Currency exchange

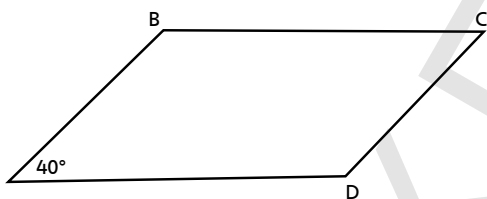
**XIV.** Which one is the scientific notation of 0.0004351?

- A.  $4351 \times 10^{-7}$
- B.  $4.35 \times 10^4$
- C.  $4.35 \times 10^{-4}$
- D.  $4.35 \times 10^{-3}$

**XV.** If a share of Rs 40 par value becomes discount share, what is its possible market value?

- A. 45
- B. 37
- C. 140
- D. 60

**XVI.** Consider the following parallelogram, Where  $m\angle A = 40^\circ$



What are the values of other three angles?

- A.  $m\angle B = 140^\circ, m\angle C = 40^\circ, m\angle D = 140^\circ$

B.  $m\angle B = 140^\circ, m\angle C = 140^\circ, m\angle D = 40^\circ$

C.  $m\angle B = 180^\circ, m\angle C = 80^\circ, m\angle D = 140^\circ$

D.  $m\angle B = 140^\circ, m\angle C = 80^\circ, m\angle D = 140^\circ$

**XVII.** Mahmood is 5 years older than his sister Faiza and their total age is 27. Which equation satisfies the given condition?

A.  $5x + 2 = 27$

B.  $x + 2 + 5 = 27$

C.  $2x + 5 = 27$

D.  $2x - 5 = 27$

[Total: /20]

## Section B

Attempt **all** questions

**[30 Marks]**

**Q2.**

- a) Mehreen represents her favourite colours as a set  $A = \{\text{pink, blue, purple}\}$ .  
List the members of the power set of A. [ / 2]

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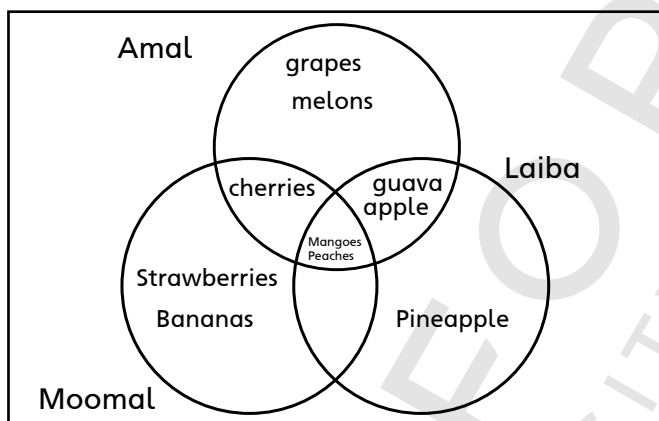


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- b) The following Venn diagram shows favourite fruits of Amal, Moomal and Laiba.



Write down the names of fruits preferred by Amal and Laiba both. [ / 1]

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Write down the names of fruits commonly preferred by Amal, Laiba and Moomal. [ / 1]

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- c) Find the square root of 2.56 after removing the decimal. [ / 2]

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**Q3. Evaluate**

a)  $(\sqrt[5]{2})^{-3} \times 2^{-\frac{4}{8}}$

[ /2]

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b)  $(\frac{4}{5})^{-9} \div (\frac{4}{5})^{-9}$

[ /2]

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c)  $\sqrt{70}$  (up to 1 decimal place)

[ /2]

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**Q4. a)** Saad got  $y$  marks for his math test. Emad got 15 more marks than Saad. Emad's score is 94.

Make an algebraic sentence for the statement.

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b) Kashif is 169 cm tall and his younger brother Mohib is  $x$  cm tall. Kashif is 38 cm taller than Mohib. Write an equation for the statement.

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c) Aymen had Rs 550. After she spent Rs 345 on snacks, and \$ $x$  for lunch, she had Rs 45 left. Express the statement in algebraic equation and find the value of  $x$ .

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**Q5.** Kainat buys a painting for Rs 25000 and sells it for Rs 28000.

a) Does she sell the painting at profit or at loss? Calculate loss or profit. [ /2]

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b) Calculate the profit or loss percentage? [ /2]

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c) Shahnaz scored 42, 34, 38, and 45 marks in her 4 Maths tests. Find his average marks in each test. [ /2]

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**Q6.**

a) Marium’s family is planning to visit USA during summer vacations. Marium saved Rs 11250 from her pocket money. She gives this amount to a money exchange company to get the equivalent US dollars. If the company offers the rate as given in the following table, how many dollars would she get? [ /2]

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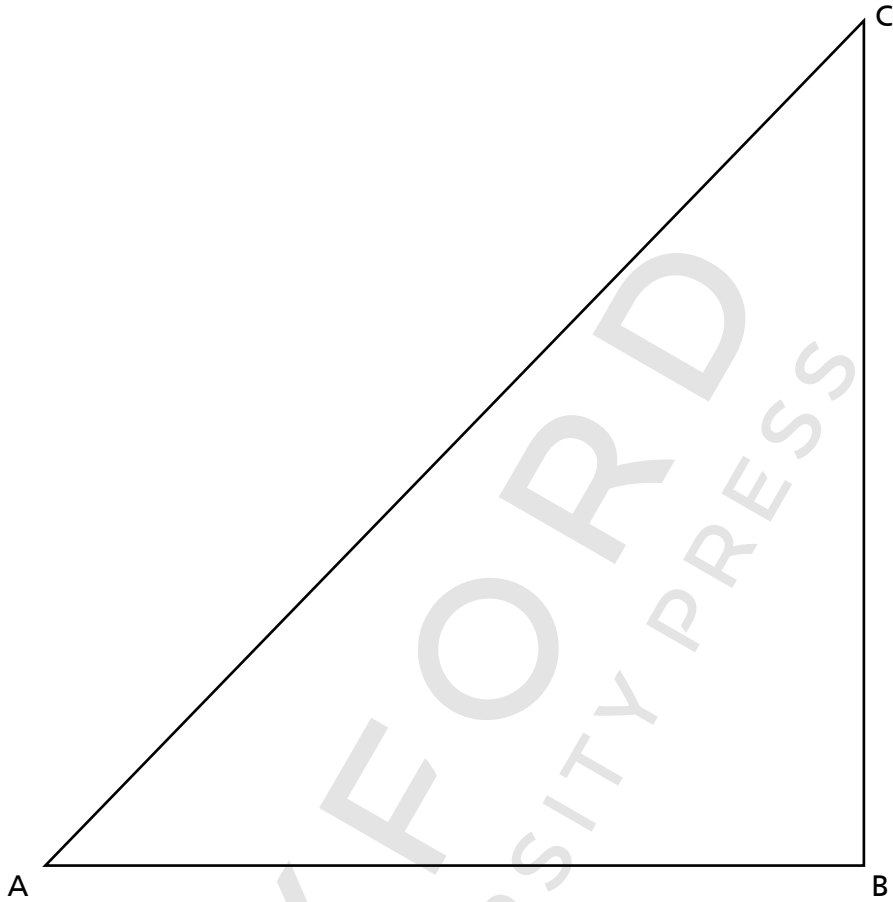
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Currency	Symbol	Rate (Rs)
US Dollars	USD	125
Euro	EUR	135
British Pound	GBP	140
Saudi Riyal	SAR	55



- b) Consider the following diagram.
- i) Construct a perpendicular bisector of line AB. [ /2]
  - ii) Draw an angle bisector of  $\angle ABC$  [ /2]



[Total : /30]

## Section C

Attempt **all** questions

**[50 Marks]**

**Q7.**

- a) Let two sets be  $P = \{a, e, d, j, k\}$  and  $Q = \{k, l, m, e, n\}$ , and  $U = \{a, c, d, e, j, k, l, m, n\}$ .  
Prove De Morgan's law of Union,  $(P \cup Q)' = P' \cap Q'$ . **[ /4]**

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- b) Malik invested Rs 12000 and purchased 100 shares of face value Rs 100 each.  
How much above par is the market value of each share? **[ /3]**

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- c) Khalida has a life insurance policy of Rs 150000 and she pays premium at the rate of 4% every year. How much premium does she pay every year? **[ /3]**

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**Q8.**

- a) Evaluate the following:  $\left[ \sqrt[3]{\frac{8}{27}} \times \sqrt[3]{216} \div \sqrt[3]{1000} \right]^{-2}$  **[ /4]**

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- b) 1764 students of a school are asked to stand in rows. If every row has as many students as there are rows, find the number of rows. [ /3]

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- c) Zohaib wants to make a  $792 \text{ cm}^3$  cylindrical water tank for his science project. He wants to know the radius of the tank. Help him to calculate the radius of the tank. [ /3]

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Q9.

- a) A shopkeeper offers a discount of 5% on all the items at his store. The marked price of an item is Rs 500. What is the sale price of the item? [ /4]

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- b) The base of a right pyramid is a rectangle whose length and breadth are 6 m and 4 m respectively. If its length of its slant edge is 13 m, find its volume and area of side-faces.

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- c) The sum of the ages of Nida and Reema is 32. In two years, Nida will be three times as old as Reema. How old are they now? [ /3]

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**Q10.**

- a) The average age of 25 girls in a class is 12 years. If three girls, aged 13, 14, and 15 and two girls each of age 16 years, are admitted to the class, what will the new average age of the girls be? [ /4]

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- b) A team of workers make 600 dozens key chains in 9 days using 20 machines. How many dozens of key chains can be made in 12 days if only 18 machines are working? [ /3]

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- c) In a group of 72 people, 30 like banana and 42 like oranges and each person likes at least one of the two fruits. How many like both banana and coffee? [ /3]

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**Q11.**

- a) If A is the set of all whole numbers less than 10,  $B = \{1, 3, 5, 7, 9, 11, 13\}$ , and  $C = \{x : x \text{ is a positive integer, } x < 7\}$ ,

i) State Associative property of union

[ /1]

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ii) Verify associative property of union using the given Venn diagrams.

[ /3]

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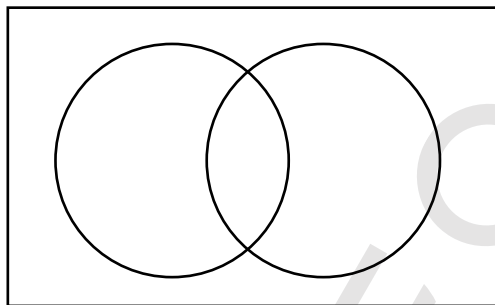


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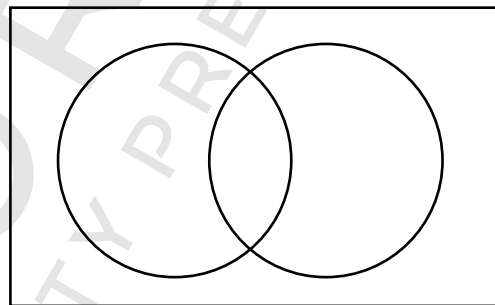


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L.H.S



R.H.S



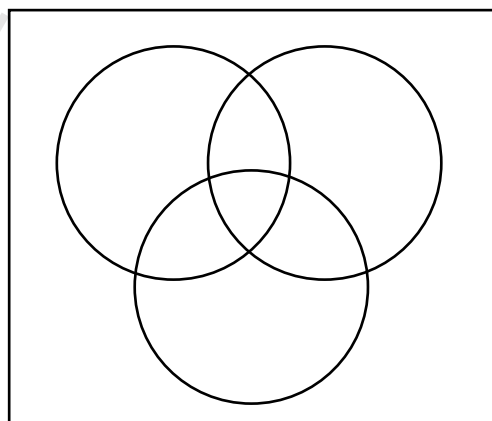
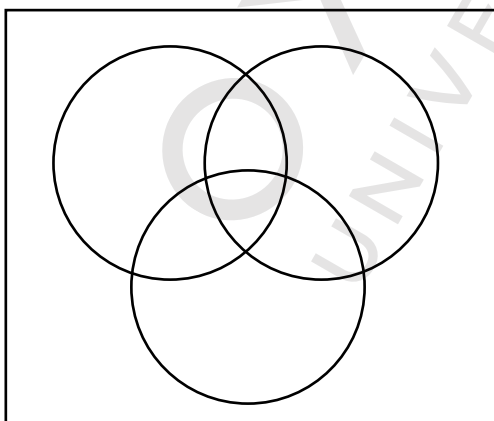

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- b) Aliya bought a few marbles and divided it equally among four of her friends and her brother, Junaid. While playing, Junaid lost 3 marbles and has only 5 marbles at present. Find how many marbles did Aliya buy in all. [ /3]

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- c) Abid borrows a book from a public library. He read a few pages on day one. On day two, he reads half the number of pages than he read on day one. On the third day, he reads 2 pages less than what he read on the first day. If he read the entire book that contains 458 pages in three days, how many pages did he read on day three? [ /3]

<b>PASS CODE</b>						
<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>

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[Total: /50]

# Model Paper 2

## Mid-Year Examination

### Mathematics

### Class VIII

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Date: \_\_\_\_\_

Time: 2 Hours

Maximum Marks: 100

### Read these instructions first:

- Write your name, section, and date clearly in the space provided.
- Answer all questions in Section A, Section B, and Section C.
- Show all your working along with the answer in the space provided.
- Omission of essential working will result in loss of marks.
- At the end of the examination, recheck your work before handing it over.
- The number of marks is given in brackets [ ] at the end of each question.
- This document consists of 11 printed pages.

\_\_\_\_\_ For Examiner's Use Only \_\_\_\_\_

Section	A	B					C					Total
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	
<b>Max. Marks</b>	20	6	6	6	6	6	10	10	10	10	10	100
<b>Marks Obtained</b>												
<b>Percentage</b>												

Invigilated by: \_\_\_\_\_ Marked by: \_\_\_\_\_ Checked by: \_\_\_\_\_

## Section A

Attempt **all** questions

[20 Marks]

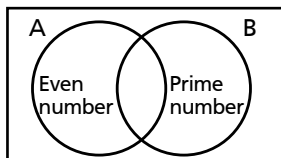
Q1. Each question has four options. Encircle the correct answer.

I. If set  $A = \{g, \{h\}, h, \{i\}, \{j, k\}\}$  then which one is a subset of set  $A$ ?

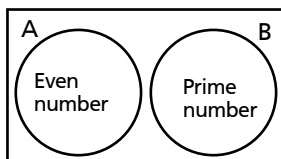
- A.  $\{g, h, i\}$
- B.  $\{h, \{i\}, j\}$
- C.  $\{g, h, \{i\}\}$
- D.  $\{1, 5, 7, 9, 11\}$

II. If  $A$  is a set of all even numbers and  $B$  is a set of all prime numbers then which Venn diagram is true?

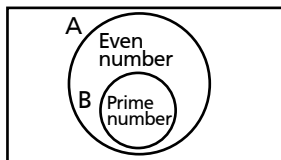
A.



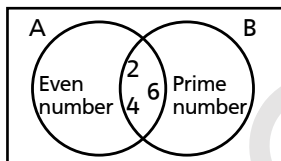
B.



C.



D.



III. Which one of the following can **NEVER** be a perfect square?

- A. A 3 digit number
- B. A number that ends at 1
- C. A 4 digit number
- D. A number that ends at 8

IV. Which of the following **IS NOT** a rational number?

- A.  $2 + \sqrt{2}$
- B.  $\sqrt{2} \times \sqrt{2}$
- C.  $(\sqrt{2})^2$
- D.  $\sqrt{2} / \sqrt{2}$

V. What is the value of  $\frac{\sqrt{4}}{2^0}$ ?

- A. 2
- B.  $\frac{2\sqrt{4}}{4}$
- C. 4
- D. 1

VI. Which of the following is the ordinary notation of  $3.03 \times 10^6$ ?

- A. 303000
- B. 303000000
- C. 3030000
- D. 30300000

VII. What is the reciprocal of  $(\frac{-2}{7})^{-1}$ ?

- A.  $-\frac{2}{7}$
- B.  $\frac{2}{7}$
- C.  $\frac{7}{2}$
- D.  $-\frac{7}{2}$

VIII. Which of the following terms are not interchangeable?

- A. market value, premium share
- B. brokerage, commission
- C. face value, nominal value
- D. stock, share

XIV. What time period is taken when interest is calculated half yearly?

- A. twice as much as the number of given years
- B. half as much as the number of given years
- C. same as the number of given years
- D. none of these

XX. If  $\log_{10} 10 = x$ , then what is the value of  $x$ ?

- A. 0
- B. 1
- C. 10
- D. 100

XI. Which of the following **IS NOT** a surd?

- A.  $\sqrt[3]{27}$
- B.  $\sqrt[3]{3}$
- C.  $\sqrt{2}$
- D.  $\sqrt{5}$



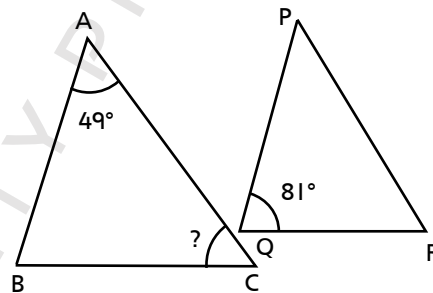
- XII.** Mohsin is offering 4% discount on all his store's items. One of his customers bought an art piece with marked price Rs 800. How much discount did he give to the customer?
- 20
  - 320
  - 32
  - 768
- XIII.** Which of the following accounts is suitable for a person who wants to deposit and withdraw amounts frequently?
- Fixed deposit account
  - PLS account
  - Current deposit account
  - Foreign currency account
- XIV.** Which of these is a premium share?
- Par value = 45, market value = 45
  - Par value = 45, market value = 40
  - Par value = 100, market value = 45
  - Par value = 45, market value = 100
- XV.** How much distance is covered by car in 4 hour with an average speed of 80 km/h?
- 20 km
  - 320 m
  - 20 m
  - 320 km
- XVI.** The volume of a cube is  $216 \text{ cm}^3$ . What is the length of its side?
- 4 cm
  - 6 cm
  - 4 m
  - $6 \text{ cm}^3$

- XVII.** Which number system satisfies the equation,  $4 + 3 = 12$
- Base 2 number system
  - Base 10 number system
  - Base 8 number system
  - Base 5 number system

- XVIII.** What is base 5 equivalent to  $32_{10}$ ?
- 16
  - 112
  - 701
  - 1111101

- XIX.** What is the value of  $\log 10 + \log 5 + \log b^2$ ?
- $\log 10b^2$
  - $\log 20b^2$
  - $\log 50b^2$
  - $\log 3b^2$

- XX.** If the following two triangle ABC and PQR are similar, then what is the measurement of angle C?



- $50^\circ$
- $70^\circ$
- $60^\circ$
- $83^\circ$

[Total: /20]

## Section B

Attempt **all** questions

**[30 Marks]**

**Q2.**

- a) During a school survey Maria gives 3 names as her favourite sports. If  $A$  is the set of the names of Maria’s favourite sports, find the number of sets in its power set  $P(A)$ . [ /2]

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- b) Find the value of  $(125)^{\frac{-4}{3}}$  [ /3]

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- c) If Umair saved Rs  $(18a + 15b)$  and Maheen saved Rs  $(12a + 7b)$  from their pocket money. Find the difference between their savings. [ /1]

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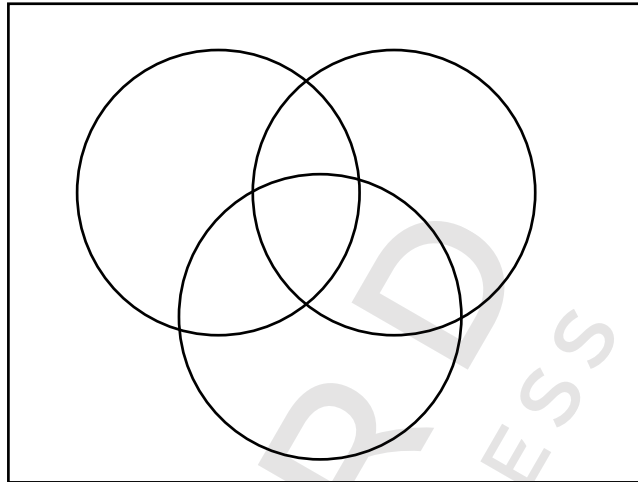
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**Q3.**

- a) Let A is a set of first 10 whole numbers, B is a set of first 5 natural numbers, and  $C = \{0, 2, 4, 6, 8\}$ .

Represent  $A \cap B \cap C$  through the given Venn Diagram by shading the required region. [ /2]



- b) Find the positive square root of 6.25. [ /2]

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- c) Express  $32 = 2^5$  in logarithmic notation. [ /1]

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- d) Zohaib bought 25 candies and then ate some. Write an expression to represent the number of candies Zohaib has left. [ /1]

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**Q4.**

- a) Five pipes take 90 minutes to fill a water tank. How many pipes are required to fill the same tank in 30 minutes? [ /3]

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- b) A shopkeeper buys 1 dozen of oranges in Rs 180 and sells them for Rs 200.

- i) How much profit does he earn? [ /1]

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- ii) Express the profit as percentage. [ /2]

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**Q5.**

- a) Subtract  $8\sqrt[8]{23} - 3\sqrt[8]{23}$  [ /2]

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- b) What is the equivalent of  $320_5$  in the base 10 system? [ /2]

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c) Convert 15 into binary number.

[ /2]

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Q6.

a) Find  $\log_4 16$  using third law of logarithms.

[ /2]

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b) Tairq wants to buy a watch that costs \$15. If the exchange rate for the rupee is Rs 110, how much money does he need in rupees to buy the watch?

[ /2]

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c) Find the cost of 100 shares at Rs 25 each at 15 premium.

[ /2]

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[Total : /30]

Section C

Attempt all questions

[50 Marks]

Q7.

- a) In a small town, various families are surveyed about their favourite pet animals. It is found that Khan family likes parrots, pigeons, and cats and Sheikh Family likes cats, dogs, rabbits, and pigeons. Prove De Morgan's law  $(A \cap B)' = A' \cup B'$ , if Universal set is defined as  $U = \{\text{sparrows, pigeons, parrots, cats, cows, dogs, goats, hens, rabbits}\}$ , A is a set of pet animals liked by Khan family, and B is a set of animals liked by Sheikh family. [ /5]

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- b) 25 men can build a 60 m wall in 8 days. How many men are required to build a 300 m wall in 20 days? [ /3]

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- c) Find the value of  $x$  in  $\log_x 729 = 3$  [ /2]

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Q8.

- a) State distributive property of union over intersection. [ /1]

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- b) If  $A = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $B = \{-2, -1, 0, 1, 2, 3, 4\}$ , and  $C = \{-5, -3, -1, 1, 3, 5, 7, 9\}$ , prove the distributive property of union over intersection. [ /4]

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- c) If the compound interest on a certain sum for 2 years at 5% is Rs 500, what would be the simple interest on the same sum for the same period and rate? [ /5]

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Q9.

- a) What should be the maximum length  $l$  of a carpet for a square floor that has an area of  $\frac{324}{81} \text{ m}^2$ ? [ /3]

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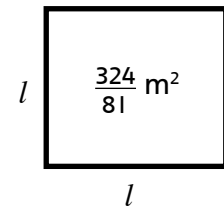
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- b) Aslam makes Rs 800000 in a year. Of this amount, Rs 300000 represents salary received from his company, Rs 200000 from his business and the rest comes from growing crops on his farm. What is the total income tax paid by Aslam? [ /4]

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Tax Laws	
Income	Tax percentage
Salary income	3%
Business income	5%
Agricultural income	8%

c) Find the smallest value of  $n$ , if  $200n$  is a perfect cube?

[ /3]

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Q10.

a) Find the product  $1101_2 \times 101_2$

[ /3]

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b) Evaluate  $111010_2 - 10111_2 + 1111_2$

[ /3]

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d) Mr. Rayyan purchased 400 shares of face value Rs 100 at Rs 900 per share. If the company pays dividend of 30%, find Mr Rayyan's earning per cent on this investment. [ /4]

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**Q11.**

- a) The following table shows the marks of 30 students of class 8 in their Maths test. Find their average marks. [ /3]

Marks	50	48	43	40	37	34
Number of students	2	4	10	7	4	3

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- b) Evaluate  $\frac{5^{-1} \times 125^{\frac{1}{2}}}{\sqrt{5}}$  [ /3]

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- c) Nouman goes to his village by train. The train covers first 600 km at 60 km/h and the remaining 400 km in 40 km/h. Calculate the average speed of the train during the journey. [ /4]

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**[Total : /50]**

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# Model Paper I

## Annual Examination

### Mathematics

### Class VIII

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Date: \_\_\_\_\_

Time: 2 Hours

Maximum Marks: 100

#### Read these instructions first:

- Write your name, section, and date clearly in the space provided.
- Answer all questions in Section A, Section B, and Section C.
- Show all your working along with the answer in the space provided.
- Omission of essential working will result in loss of marks.
- At the end of the examination, recheck your work before handing it over.
- The number of marks is given in brackets [ ] at the end of each question.
- This document consists of 12 printed pages.

\_\_\_\_\_ **For Examiner's Use Only** \_\_\_\_\_

Section	A	B					C					Total
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	
<b>Max. Marks</b>	20	6	6	6	6	6	10	10	10	10	10	100
<b>Marks Obtained</b>												
<b>Percentage</b>												

Invigilated by: \_\_\_\_\_ Marked by: \_\_\_\_\_ Checked by: \_\_\_\_\_

## Section A

Attempt all questions

[20 Marks]

Q1. Each question has four options. Encircle the correct answer.

I. If  $A = \{2, 4, 6, 8\}$ ,  $A \cap B = \{6, 8\}$ , and  $A \cup B = \{2, 4, 5, 6, 7, 8\}$ , which one of the following shows the elements of set B?

- A.  $\{2, 4, 5, 6, 7, 8\}$
- B.  $\{2, 4, 5, 6\}$
- C.  $\{5, 6, 7, 8\}$
- D.  $\{2, 4, 6, 8\}$

II. What is the value of  $\sqrt{5} \times 5^{-\frac{1}{2}}$ ?

- A. 5
- B. 1
- C.  $\sqrt{5}$
- D. 0

III. If the broker's commission is 2%, how is the brokerage calculated to buy 20 shares of Rs 500 each?

- A.  $\frac{2}{100} \times 100 \times 200$
- B.  $\frac{2}{100} \times 10000$
- C.  $\frac{2}{100} \times 500$
- D.  $\frac{2}{100} \times 200 + 500$

IV→ Which of these IS NOT the rule of binary addition?

- A.  $1 + 1 = 10$
- B.  $1 + 0 = 1$
- C.  $1 + 1 + 1 = 11$
- D.  $1 + 0 + 1 = 11$

V. What is the expansion of  $(a - \frac{1}{a})^2$ ?

- A.  $a^2 - 2a + \frac{1}{a^2}$
- B.  $a^2 + 2a + \frac{1}{a^2}$
- C.  $a^2 - 2 + \frac{1}{a^2}$
- D.  $a^2 + 2 + \frac{1}{a^2}$

VI. Zehra wants to buy a rug for her room. Her room's floor is square in shape. If the area of her room is  $(x^2 + 2xy + y^2) \text{ m}^2$  then what is the length of each side?

- A.  $(x + y) \text{ m}$
- B.  $(x + y)^2 \text{ m}$
- C.  $(x + y)(x - y) \text{ m}$
- D.  $(x - y) \text{ m}$

VII. Which one is the factorized form of  $16a^2 + 4b^2$ ?

- A.  $4ab(4a + b)$
- B.  $(4a + 2b)(4a - 2b)$
- C.  $4(4a^2 + b^2)$
- D.  $2ab(8a + 2b)$

VIII. Following is the data Mohid has recorded for his class tests marks. He has forgotten the marks of one of his class tests.

6	9	8	5	8	9	6	5	7	8	?
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If 8 is the mode value of the marks, which of the following is the missing value?

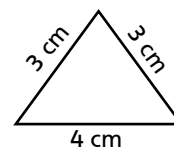
- A. 5
- B. 6
- C. 7
- D. 9

IX. What is the lowest term of  $\frac{8a^2b^3}{20a^5b^2}$ ?

- A.  $\frac{2b}{5a^2}$
- B.  $\frac{2ab}{5}$
- C.  $\frac{2b^5}{5a^7}$
- D.  $2ab$

X. What is the value of the semi perimeter of the given triangle?

- A. 10 cm
- B. 5 cm
- C. 20 cm
- D. 3 cm



XI. What is the simplified form of  $\frac{1}{x+1} + \frac{1}{y+z}$ ?

- A.  $\frac{x+2+y}{(x+1)(y+z)}$
- B.  $\frac{(x+y+z)}{(x+1)(y+z)}$
- C.  $\frac{(x+2)}{(xy+z)}$
- D.  $\frac{x+y+z}{(x+1)(y+z)}$

XII.  $x + y = 6$  and  $3x + 2y = 13$  are two simultaneous linear equations. What are the values of  $x$  and  $y$ ?

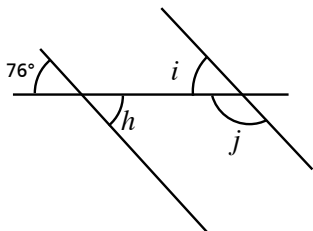
- A.  $x = 3, y = 3$
- B.  $x = 4, y = 2$
- C.  $x = 5, y = 1$
- D.  $x = 1, y = 5$

**XIII.** Which term is defined as a statement that is developed on the basis of postulates and axioms?

- A. Corollary
- B. Theorem
- C. Hypothesis
- D. None of the above

**XIV.** Which of the following statements is true for the given figure?

- A.  $h = 76^\circ$ ,  $i = 104^\circ$ ,  $j = 76^\circ$
- B.  $h = 104^\circ$ ,  $i = 104^\circ$ ,  $j = 76^\circ$
- C.  $h = 76^\circ$ ,  $i = 76^\circ$ ,  $j = 104^\circ$
- D.  $h = 76^\circ$ ,  $i = 104^\circ$ ,  $j = 104^\circ$



**XV.** Rabia buys a football to play during her summer vacations. The ball has a radius of 5 cm. What is the surface area of the ball?

- A.  $100 \pi \text{ cm}^2$
- B.  $20 \pi \text{ cm}^2$
- C.  $\frac{100}{3} \pi \text{ cm}^2$
- D.  $500 \pi \text{ cm}^2$

**XVI.** Which matrix shows the difference of

$$\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix} \text{ and } \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} ?$$

- A. Null matrix of order  $2 \times 2$
- B. Unit matrix of order  $2 \times 2$
- C. Row matrix with all elements equal to 1
- D. Column matrix with all elements equal to 1

**XVII.** Two points A' and B' are symmetric to A and B with respect to an axis of symmetry. If line  $AB = 4.5 \text{ cm}$ , what is the length of line A'B'?

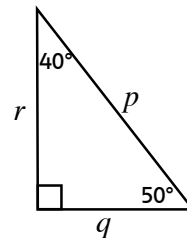
- A. 2.25 cm
- B. 5.4 cm
- C. 4.4 cm
- D. 4.5 cm

**XVIII.** What is the median value of 3, 3, 5, 6, 6, 7, 9, 11?

- A. 12
- B. 6
- C. 3
- D. 11.5

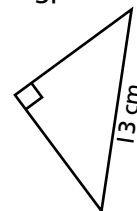
**XIX.** Which one **IS NOT** the correct ratio for the given triangle?

- A.  $\sin 50^\circ = \frac{r}{p}$
- B.  $\cos 50^\circ = \frac{q}{p}$
- C.  $\tan 50^\circ = \frac{r}{q}$
- D.  $\sin 50^\circ = \frac{p}{r}$



**XX.** Which triangle has the hypotenuse = 13 cm?

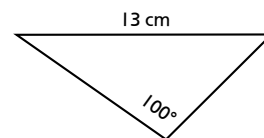
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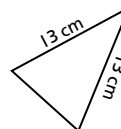
B.



C.



D.



[ Total: /20 ]

## Section B

Attempt **all** questions

**[30 Marks]**

**Q2.** The ages of two brothers Sarim and Umair add upto 31 and the difference between their ages is 5 years. Sarim is the elder brother.

a) Form two simultaneous equations. [ /1]

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b) Find out their ages. (Use substitution method) [ /3]

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c) Simplify  $\frac{x^2 - 1}{x^3 - 1}$  [ /2]

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**Q3.** Shuja divides Rs 84 between his sister and his brother in such a way that his sister gets Rs 25 for each Rs 10 that his brother gets.

a) If Shuja's brother gets Rs  $x$ , write down the expression for the amount that his sister would get. [ /1]

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b) Form the equation for the given situation. [ /1]

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c) Calculate the amount that the sister and brother each get. [ /2]

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d) Find  $\sqrt[3]{343} \div \sqrt[3]{-343}$

[ /2]

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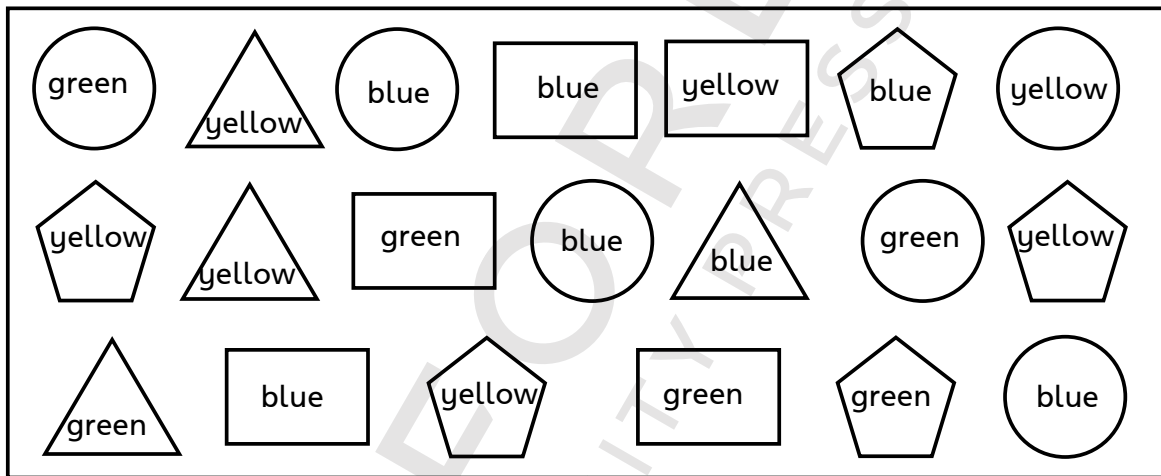
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**Q4.** Khalid is working on a project. He is allowed to use a limited number of different coloured shapes for his project. Following are the coloured shapes that are assigned to Khalid.



a) Create a matrix, where the rows indicate shapes and the columns indicate colours, to help Khalid in organizing the shapes. [ /2]

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b) Find the transpose of the above matrix. [ /1]

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- c) Mr Asim has a life insurance policy of Rs 150000 . He pays premium to the insurance company at rate of 3% every year. What is the size of the premium paid by Mr Asim every year.? [ /3]

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Q5.

- a) The top of a building forms an angle of  $60^\circ$  with a point 50 m away from its base. How tall is the building? [ /3]

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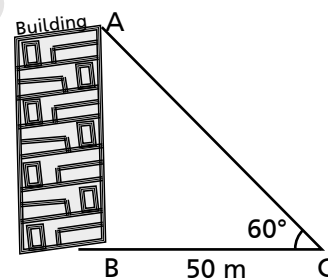
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- b) Solve  $\frac{3x-1}{2} = \frac{x-5}{4}$  [ /3]

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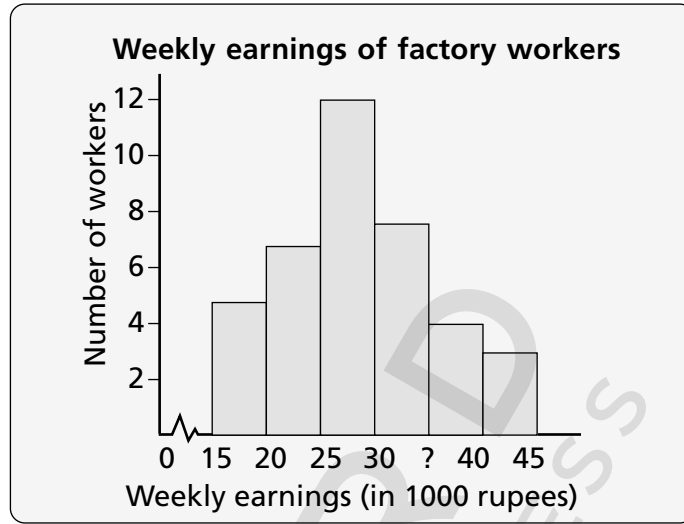
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**Q6.** Following histogram and frequency table shows the weekly earnings of factory workers. Few values are missing in histogram and table both.

a) Find out the missing value in histogram.

[ /1]



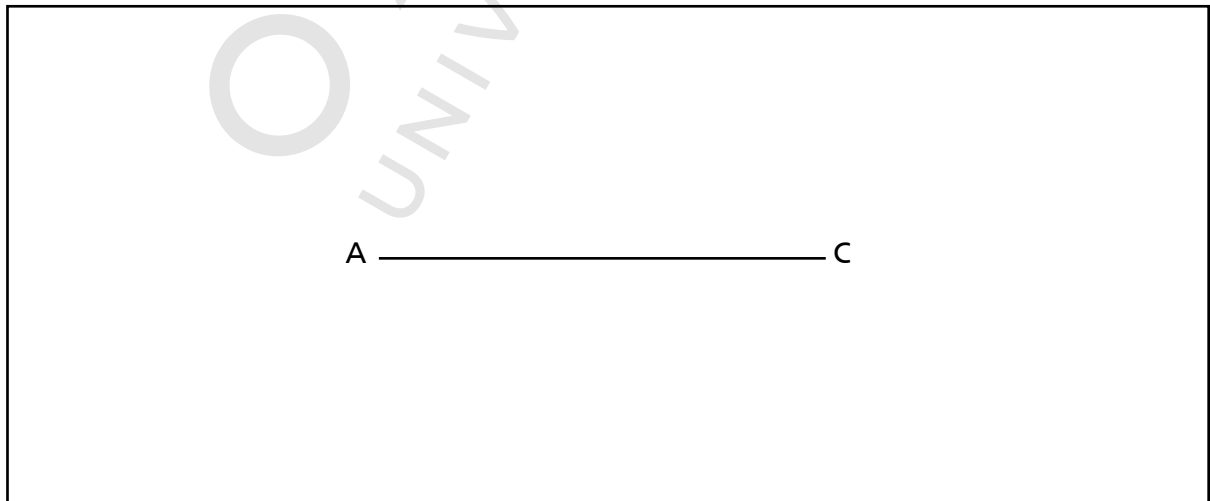
b) Complete the following table.

[ /2]

Weekly earnings (in rupees)	No. of workers
15000 – 20000	5
20000 – 25000	?
?	12
30000 – 35000	8
35000 – 40000	3

c). Construct a kite with two sides measuring 4 cm and 8 cm respectively. The diagonal has already been drawn for you.

[ 3]



[Total : /30]

## Section C

Attempt **all** questions

[50 Marks]

**Q.7** One fine day Jahangir drinks "a" number of glasses of banana shake and Laraib drinks "b" number of glasses of strawberry shake at a restaurant. Their total bill is Rs 420. The rates are given in the following table.

- a) Write down the equation for the above statement. [ /1]

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Shake	Price in Rs
Banana	60
Mango	100
Strawberry	120
Dates	150
Vanilla	120
Almond	200
Chocolate	120

- b) Next day they both drink the same number of glasses each.

This time Jahangir drinks mango shake whereas Laraib drinks Chocolate shake and they paid Rs 540 in total.

Form the equation.

[ /1]

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- c) How many glasses do Jahangir and Laraib drink each day? (use elimination method) [ /4]

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- d) Factorise  $4(m + n)^2 - 12(m + n)(a + b) + 9(a + b)^2$  [ /4]

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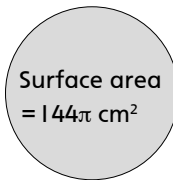
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**Q9.** Aleen plays with her play dough and makes a sphere. The surface area of the sphere is  $144\pi \text{ cm}^2$ .



a) What is the radius of the sphere? [ /3]

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b) Find out the volume of the sphere? (Give your answer in terms of  $\pi$ .) [ /3]

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c) How many smaller spheres of radius 3 cm each can be made out of it? [ /4]

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**Q10.**

- a)  $\overleftrightarrow{PQ}$  and  $\overleftrightarrow{RS}$  are two straight lines intersecting at O. Show that if the bisector  $\overleftrightarrow{LM}$  of  $\angle POR$  is produced through O, it will bisect  $\angle QOS$ . [ /4]

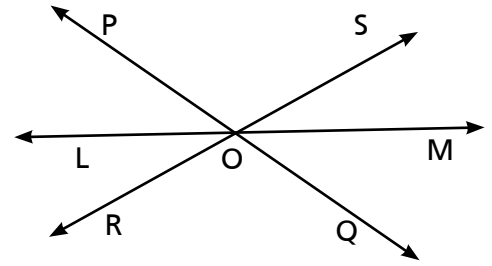
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- b) If  $x + y = -\frac{1}{3}$ , prove that  $x^3 + y^3 - xy = -\frac{1}{27}$  [ /4]

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- c) Find cube of  $3x - 2$  [ /2]

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Q11.

a) Simplify

[ /5]

$$\frac{x^2 + 2x}{2x^2 + 5x - 3} \times \frac{2x - 1}{x^2 + 4x + 4} \div \frac{x^2 - 2x}{x + 3}$$

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b) Construct a rhombus ABCD with each side measuring 6 cm and  $m\angle A = 55^\circ$  .

[ /5]

[Total : /50]

# Model Paper 2

## Annual Examination

### Mathematics

### Class VIII

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Date: \_\_\_\_\_

Time: 2 Hours

Maximum Marks: 100

#### Read these instructions first:

- Write your name, section, and date clearly in the space provided.
- Answer all questions in Section A, Section B, and Section C.
- Show all your working along with the answer in the space provided.
- Omission of essential working will result in loss of marks.
- At the end of the examination, recheck your work before handing it over.
- The number of marks is given in brackets [ ] at the end of each question.
- This document consists of 11 printed pages.

\_\_\_\_\_ **For Examiner's Use Only** \_\_\_\_\_

Section	A	B					C					Total
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	
<b>Max. Marks</b>	20	6	6	6	6	6	10	10	10	10	10	100
<b>Marks Obtained</b>												
<b>Percentage</b>												

Invigilated by: \_\_\_\_\_ Marked by: \_\_\_\_\_ Checked by: \_\_\_\_\_

## Section A

Attempt **all** questions

[20 Marks]

Q1. Each question has four options. Encircle the correct answer.

I. Which of the following laws is De Morgan's law?

- A.  $A \cup B = B \cup A$
- B.  $A' \cap B' = (A \cap B)'$
- C.  $A' \cup B' = (A \cap B)'$
- D.  $A' \cup B' = (A \cap B)'$

II. How many lines of symmetry does the rectangle have?

- A. 1
- B. 2
- C. 3
- D. 4



III. Which of the following matrices is equal to  $\begin{bmatrix} 2 & 27 \\ 3 & -4 \end{bmatrix}$ ?

- A.  $\begin{bmatrix} 1+1 & 4^2 \\ 4-1 & -4 \end{bmatrix}$
- B.  $\begin{bmatrix} 4-2 & 27 \\ 3-3 & -2^2 \end{bmatrix}$
- C.  $\begin{bmatrix} \sqrt{4} & 3^3 \\ 3 & -2^2 \end{bmatrix}$
- D.  $\begin{bmatrix} -2 & 27 \\ 3 & 4 \end{bmatrix}$

VI. What is base 10 equivalent of  $1011_2$ ?

- A. 10
- B. 11
- C. 12
- D. 13

V. If the surface area of a spherical ball is  $36\pi$  cm<sup>2</sup> then what is the length of its radius?

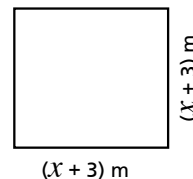
- A.  $\sqrt{4}$  cm
- B. 2 cm
- C.  $\sqrt{9}$  cm
- D. 81 cm

VI. What is the scientific notation of 0.00000579?

- A.  $579 \times 10^{-8}$
- B.  $5.79 \times 10^6$
- C.  $579 \times 10^8$
- D.  $5.79 \times 10^{-6}$

VII. Jamil wants to measure the area of his room's floor that is square in shape. If the side length of the floor is  $(x + 3)$  m, what is the area?

- A.  $2(x + 3)$  m<sup>2</sup>
- B.  $(x^2 - 6x + 9)$  m<sup>2</sup>
- C.  $(x^2 + 6x + 9)$  m<sup>2</sup>
- D.  $(x + 3)(x - 3)$  m<sup>2</sup>

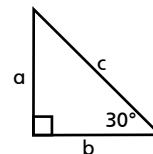


VIII. Which one is the factorized form of  $a^2 - 2 + \frac{1}{a^2}$ ?

- A.  $(a - \frac{1}{a})^2$
- B.  $(\frac{1}{a} - a)^2$
- C.  $(a + \frac{1}{a})^2$
- D.  $(\frac{1}{a} + a)^2$

IX. Which is the correct trigonometric ratio for 30° in the given triangle?

- A.  $\sin 30^\circ = \frac{b}{a}$
- B.  $\tan 30^\circ = \frac{b}{a}$
- C.  $\sin 30^\circ = \frac{b}{c}$
- D.  $\tan 30^\circ = \frac{b}{c}$



X. What is the first term of the quotient in  $(3x^3 + 2x^2 - x - 1) \div (x + 2)$ ?

- A.  $3x$
- B.  $x$
- C.  $3x^2$
- D.  $3x^3$

XI. The three sides of a right angle triangle are measured as, 20 mm, 29 mm, and 21 mm. what is the length of its hypotenuse?

- A. 20 mm
- B. 21 mm
- C. 29 mm
- D. 202 mm

XII. Mariyum played four games. She scored 4, 3, 8, and 6 points in the four games respectively. What is her median score?

- A. 2
- B. 5.5
- C. 2.5
- D. 5



- XIII.** Which one is the common denominator for  $\frac{2x-1}{xy} + \frac{3-4x}{2x}$  ?
- $2xy$
  - $2x + xy$
  - $(2x - 1)(3 - 4x)$
  - $2 - 2x$

- XIV.** Which equation can be expressed as  $\log_x 625 = 4$  ?
- $\log_x 625 = 5$
  - $5^4 = x^4$
  - $4^5 = x^5$
  - $\log_x 5 = 4$

- XV.**  $2x + 3y = 16$  and  $x - y = 3$  are two simultaneous linear equations. What are the values of  $x$  and  $y$  ?
- $x = 6, y = 3$
  - $x = 2, y = 4$
  - $x = 5, y = 2$
  - $x = 2, y = 5$

- XVI.** If the semi-perimeter of the given triangle is 8, what is the value of  $x$  ?

- 5
- 6
- 7
- 8



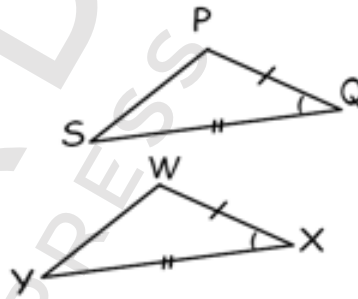
- XVII.** If two quantities are in a proportion in such a way that if one quantity increases the other decreases, then which of the following describes the type of the proportion ?
- Direct proportion
  - Inverse proportion
  - Equal proportion
  - None of the above

- XVIII.** What is the value of  $(x + y)^2$ , if  $x^2 + y^2 = 19$  and  $2xy = 6$  ?

- 22
- 25
- 5
- $\sqrt{5}$

- XIX.** Which of the following postulates satisfy the congruence between the given triangles ?

- Side-Side-Side (SSS)
- Angle-Side-Angle (ASA)
- Side-Angle-Side (SAS)
- Pythagoras' Theorem



- XX.** When 14 is subtracted from a number, the remainder is 2 more than half of the number.

Which equation shows the above scenario ?

- $x - 14 = \frac{x+2}{2}$
- $\frac{x-14}{2} = x + 2$
- $x - 14 = \frac{x}{2} + 2$
- $x - 14 + 2 = \frac{x}{2}$

[Total: /20]

## Section B

Attempt **all** questions

**[30 Marks]**

**Q2.** In September a company hires 14 male and 4 female employees for its Karachi office, and 13 male and 2 female employees for its Islamabad office. In December the company hires more 12 male and 3 female employees for Karachi, and 11 male and 1 female for Islamabad.

a) Represent the given information using two matrices, Matrix A and Matrix B. **[ /2]**

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b) How many male and female employees are hired for each office during the two months? (Use matrices for calculation) **[ /2]**

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c) Sophia wants to wrap conical birthday caps with different colour sheets. What is the surface area of the given cap? Give your answer in terms of  $\pi$ . **[ /2]**

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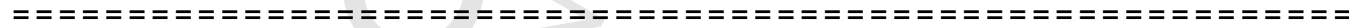
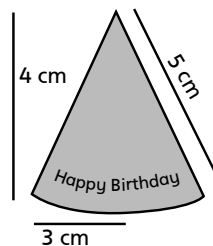
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**Q3.**

a) The following table shows the heights of five friends. If the mean height is 102 cm, find the height of Asim. **[ /3]**

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Names	Height (cm)
Ramish	105
Hassan	100
Asim	?
Ashar	102
Abdul Qadir	103

b) Find the cube of  $2x + y$ .

[ /2]

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c) Express 12 in radical form of order 3.

[ /1]

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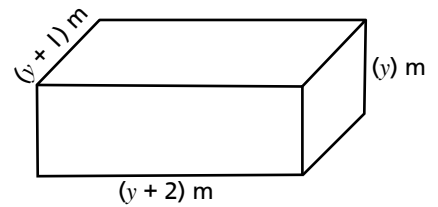
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**Q4.** A rectangular swimming pool measures  $(y)$  m by  $(y + 1)$  m by  $(y + 2)$  m.



a) Express the volume of swimming pool in terms of  $y$ .

[ /1]

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b) Simplify the expression.

[ /3]

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c) If  $y = 20$ , calculate the volume of the swimming pool.

[ /2]

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**Q5.** Sarim bought 200 shares from a renowned company at Rs 50 each. He bought the shares through a broker who charged a commission of 2%.

a) Calculate the price paid for each share.

[ /3]

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b) Price paid for the purchased shares.

[ /2]

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c) Ahsan buys a calculator that costs \$20. If the exchange rate for rupee is 115, how much money does he pay in rupees?

[ /1]

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Q6.

- a) Simplify  $\frac{b-c}{bc} + \frac{c-a}{ca} + \frac{a-b}{ab}$  [ /3]

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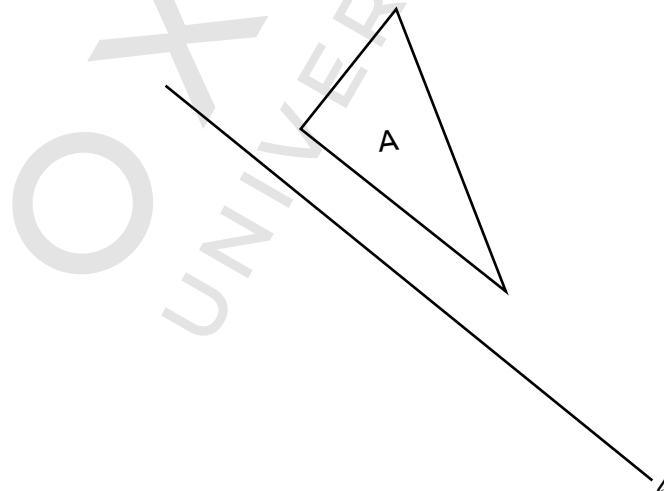


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- b) Divide the given line segment AB into three equal parts. AX has already been drawn for you. [ /2]



- c) Draw a figure symmetric to the given figure A with respect to the line of symmetry 'l' [ /1]



[Total : /30]

## Section C

Attempt **all** questions

**[50 Marks]**

**Q7.**

- a) If an amount of Rs  $(x^3 + y^3 + 3x^2y + 3xy^2)$  is to be distributed equally among  $(x + y)$  persons how much will each person receive? **[ /3]**

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- b) Find the value of  $a^3 + b^3 - 9ab$ , if  $a + b + 3 = 0$ . **[ /4]**

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- c) The denominator of a fraction exceeds the numerator by 5. If the numerator of this fraction is increased by 8, the fraction increases by unity. Find the fraction. **[ /3]**

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**Q8.** The following table shows the marks scored by the students in Maths test.

- a) Complete the following table and find out the mean marks. **[ /5]**

Marks ( $x$ )	8	9	12	13	14	
No. of Students ( $f$ )	3	4	6	4	2	$\sum f =$
$fx$						$\sum fx =$

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b) Simplify  $\frac{a^2 + 3a + 2}{a^2 - 4a - 12} \times \frac{a^2 - 7a + 6}{a^2 - 1}$

[ /5]

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Q9.

- a) Iman buys a cone full of ice-cream with a hemisphere of ice-cream on top. The radius of a hemisphere is 3 cm and its base coincides with the cone's top. The height of the cone is 9 cm. When she pours the ice-cream in a jar, it is filled completely. Find out the volume of the jar. [ /5]

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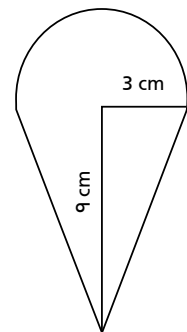
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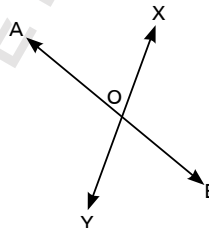
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- b) Lines  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{XY}$  intersect each other at point O. Prove that the vertically opposite angles are congruent. [ /5]



Statements	Reasons

Q10.

- a) Malika and Mishaal went to the market to buy jewelry. Malika bought 2 rings and 2 bracelets and paid Rs 270. Mishhal bought 4 rings and 3 bracelets and paid Rs 455. Find the cost of each ring and each bracelet if the price of all rings are same and all bracelets are same. [ /5]

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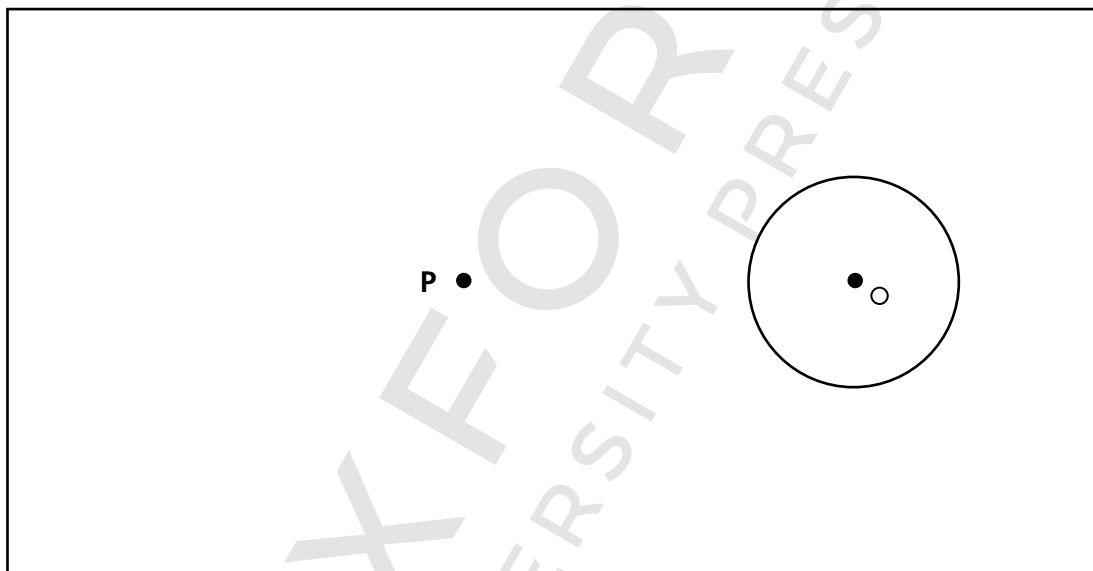


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- b) Consider the following circle with centre O. there is a point P at a distance of 4 cm.  
i) Draw two tangents to the circle from the given point P. [ /4]



- a) What is your conclusion regarding the lengths of both the tangents? [ /1]

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Q11.

- a) In a city, the following observations were made in a study of the daily wages of 40 workers. [ /3]  
Draw histogram of the given data.

Wages in rupees	Number of workers
150 – 200	4
200 – 250	12
250 – 300	18
300 – 350	4
350 – 400	2





b) Consider triangle ABC.

i) Calculate the length of  $\overline{AB}$

[ /3]

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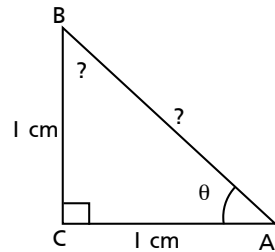
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ii) Calculate  $\angle CAB$ .

[ /3]

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iii) Find out the third angle.

[ /1]

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[Total : /50]

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# Model Paper 3

## Annual Examination

### Mathematics

### Class VIII

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Date: \_\_\_\_\_

Time: 2 Hours

Maximum Marks: 100

#### Read these instructions first:

- Write your name, section, and date clearly in the space provided.
- Answer all questions in Section A, Section B, and Section C.
- Show all your working along with the answer in the space provided.
- Omission of essential working will result in loss of marks.
- At the end of the examination, recheck your work before handing it over.
- The number of marks is given in brackets [ ] at the end of each question.
- This document consists of 12 printed pages.

\_\_\_\_\_ **For Examiner's Use Only** \_\_\_\_\_

Section	A	B					C					Total
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	
<b>Max. Marks</b>	20	6	6	6	6	6	10	10	10	10	10	100
<b>Marks Obtained</b>												
<b>Percentage</b>												

Invigilated by: \_\_\_\_\_ Marked by: \_\_\_\_\_ Checked by: \_\_\_\_\_

## Section A

Attempt **all** questions

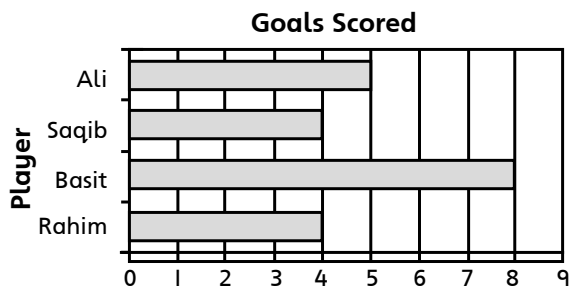
**[20 Marks]**

**Q1.** Each question has four options. Encircle the correct answer.

**I.** Following is the graph showing the goal scores of four friends.

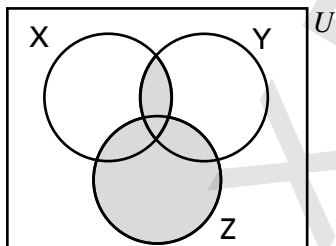
What is the mode score?

- A. 4
- B. 5
- C. 7
- D. 8



**II.** Which of the following represents the shaded region in the given Venn diagram?

- A.  $(X \cap Z) \cup Y$
- B.  $(X \cap Y) \cup Z$
- C.  $(X \cup Z) \cap Y$
- D.  $(Y \cap Z) \cup X$



**III.** Javeria wants to buy a cubical tank of volume  $(x^3 - 3x^2y + 3xy^2 - y^3) \text{ m}^3$ . What should be the length of each side?

- A.  $(x - y)^3 \text{ m}$
- B.  $(x - y) \text{ m}$
- C.  $(x + y)^3 \text{ m}$
- D.  $(x + y) \text{ m}$

**IV.** Which of the following matrices is the transpose of  $\begin{bmatrix} 4 & -5 \\ -8 & 2 \\ 3 & -4 \end{bmatrix}$ ?

- A.  $\begin{bmatrix} -5 & 4 \\ 2 & -8 \\ -4 & 3 \end{bmatrix}$
- B.  $\begin{bmatrix} -4 & 8 & -3 \\ 5 & -2 & 4 \end{bmatrix}$

- C.  $\begin{bmatrix} 4 & -8 & 3 \\ -5 & 2 & -4 \end{bmatrix}$
- D.  $\begin{bmatrix} -4 & 2 & -5 \\ 3 & -8 & 4 \end{bmatrix}$

**V.** What is base 5 equivalent of  $28_{10}$ ?

- A. 103
- B. 163
- C. 35
- D. 1111011011<sub>2</sub>

**VI.** What is the area of a,  $(2x + y) \text{ m}$  by  $(2x - y) \text{ m}$  rectangular field?

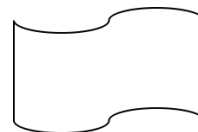
- A.  $4x^2 - y^2$
- B.  $4x^2 + 8xy + y^2$
- C.  $4x^2 + y^2$
- D.  $4x^2 + 8xy + y^2$

**VII.** What is the ordinary notation of  $8.495 \times 10^{-6}$ ?

- A. 0.00008495
- B.  $0.0008495 \times 10^{-5}$
- C. 8495000.0
- D.  $84.95 \times 10^{-3}$

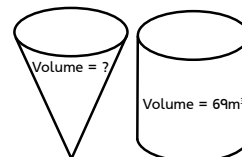
**VIII.** How many lines of symmetry does the following shape have?

- A. 0
- B. 1
- C. 2
- D. 3



**IX.** If the volume of a cylindrical container is  $69 \text{ m}^3$ , then what is the volume a conical container with same height and base area as of the cylindrical container?

- A.  $34.5 \text{ m}^3$
- B.  $23 \text{ m}^3$
- C.  $138 \text{ m}^3$
- D.  $69 \text{ m}^3$



**X.** Which of the following forms a triangle with a hypotenuse?

- A. One of its angle is  $120^\circ$
- B. Three sides measuring  $\sqrt{20} \text{ cm}$ ,  $\sqrt{10} \text{ cm}$ ,  $\sqrt{5} \text{ cm}$
- C. Three sides measuring  $\sqrt{10} \text{ cm}$ ,  $\sqrt{8} \text{ cm}$ ,  $\sqrt{18} \text{ cm}$
- D. All three angles are equal

**XI.** Which of the following banking instruments is used for intercity transfer of amount?

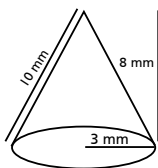
- A. Demand draft
- B. Pay order
- C. Both A and B
- D. None of the above

**XII.** What is the value of  $\sin 45^\circ$  ?

- A.  $\frac{1}{\sqrt{2}}$
- B.  $\frac{1}{2}$
- C.  $\frac{\sqrt{3}}{2}$
- D.  $\frac{\sqrt[3]{2}}{2}$

**XIII.** What is the curved surface area of the given cone?

- A.  $96 \pi \text{ mm}^2$
- B.  $24 \pi \text{ mm}^2$
- C.  $30 \pi \text{ mm}^2$
- D.  $120 \pi \text{ mm}^2$



**XIV.** What is the value of  $\log_x 1$ ?

- A. 0
- B. 1
- C.  $x$
- D. None of the above

**XV.** What is the lowest term of  $\frac{x^3 y^2}{x^6 y^5}$ ?

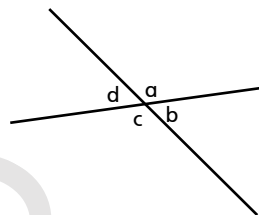
- A.  $\frac{x^3}{x^6 y^5}$
- B.  $\frac{y^2}{x^3}$
- C.  $\frac{x^9 y^7}{1}$
- D.  $\frac{1}{x^3 y^3}$

**XVI.** How many solutions does the equation  $2x - 5y = 7$  have?

- A. A unique solution
- B. Many solutions
- C. Two solutions
- D. No solution

**XVII.** If angle  $a = 145^\circ$  in the given figure, what are the measurements of other three angles?

- A.  $b = 35^\circ, c = 145^\circ, d = 35^\circ$
- B.  $b = 145^\circ, c = 145^\circ, d = 35^\circ$
- C.  $b = 145^\circ, c = 35^\circ, d = 145^\circ$
- D.  $b = 35^\circ, c = 145^\circ, d = 145^\circ$



**XVIII.** What is the average speed of a truck if it covers the distance of 550 km in 5 hours?

- A. 2750 km/h
- B. 110 km/h
- C. 1100 km/h
- D. 270 km/h

**XIX.** Khalid makes a spherical ball of volume  $94 \text{ cm}^3$  using his play dough. Then he makes a hemisphere with the same radius as of the ball what is the volume of the hemisphere?

- A.  $184 \text{ cm}^3$
- B.  $47 \text{ cm}^3$
- C.  $31.33 \text{ cm}^3$
- D.  $282 \text{ cm}^3$

**XX.** What is a share called when the market value exceeds the par value?

- A. Dividend
- B. Brokerage
- C. Premium
- D. Insured

[Total: /20]

## Section B

Attempt **all** questions

**[30 Marks]**

**Q2.**

- a) Baneen has a square area with the side length  $(2x - y)$  cm each, to keep a fish aquarium. She wants to buy a cubical aquarium. What should be the volume of the tank? [ /2]

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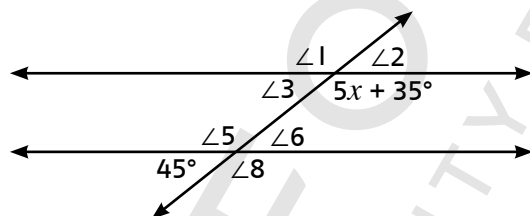
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- b) Find the value of  $x$  in the following. [ /2]




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- c) Find the median value of 18 16 20 18 15 10 17 19 [ /2]

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**Q3.**

a) Evaluate  $(101)^2$  using algebraic identities.

[ /3]

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b) Factorise  $x^4 - 5x + 4$

[ /3]

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**Q4.**

a) If  $x^2 - y^2 = z^2$ , find the value of  $x^6 - y^6 - 3x^2 y^2 z^2$ .

[ /3]

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b) On Monday, a gardener planted 5 trees and 6 rose plants. On Tuesday, he planted 6 trees and 4 rose plants.

i) Create a matrix to organize the information.

[ /2]

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ii) On which day he planted more?

[ /1]

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Q5.

Humaira sells  $(x + 4)(x + 5)$  flowers in one day. If she sells same number of flowers each day at Rs  $(x + 6)$  each,

a) Write an expression for the total money she has at the end of the day. [ /1]

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b) Simplify the expression. [ /3]

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c) If  $x = 2$ , find the total amount. [ /2]

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Q6.

- a) Kamran makes a model of a traffic cone. He wants to wrap the surface of the conical part of it with a sheet. Find out the surface area of the cone to get the rough idea of of wrapping sheet. (take  $\pi = 22/7$ ) [ /3]

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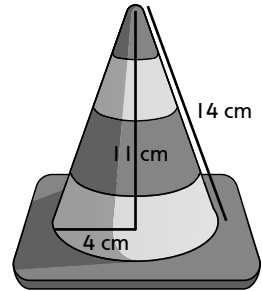
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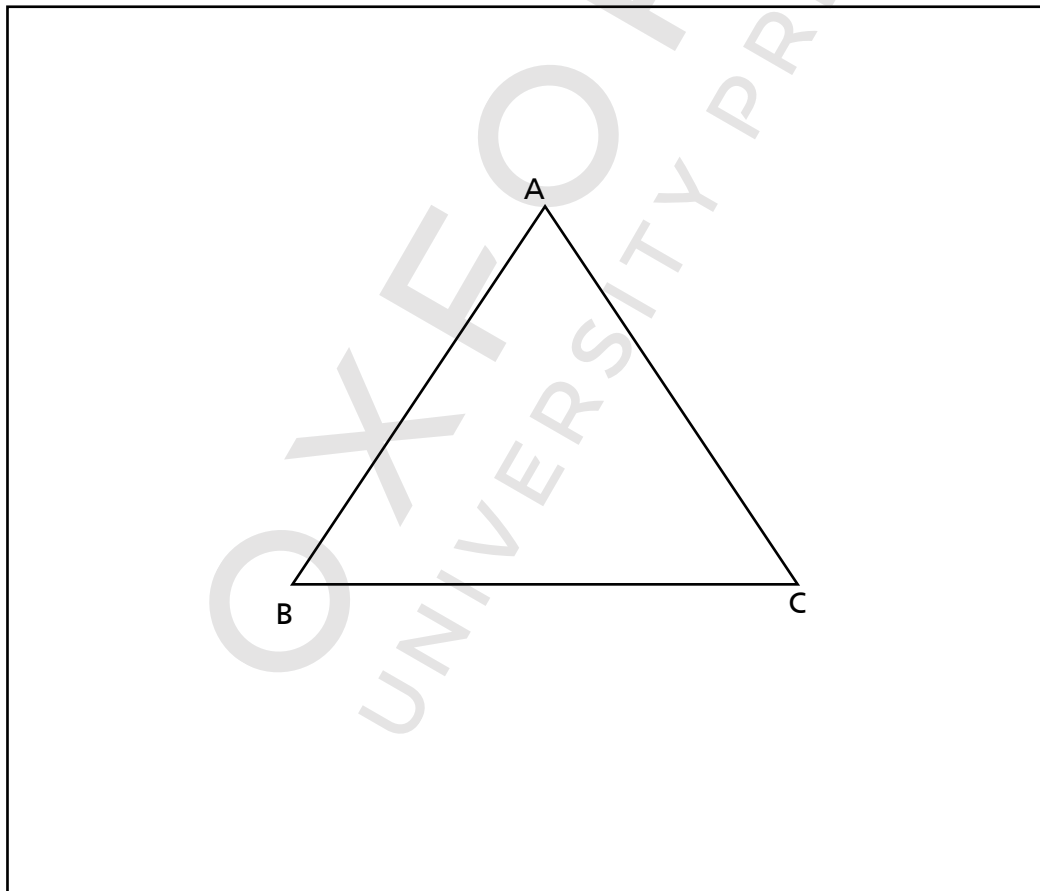
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- b) Draw in-circle of the given triangle. [ /3]



[Total: /30]

## Section C

Attempt all questions

[50 Marks]

Q7.

- a) Shiza sold 1000 tickets. She charged Rs 85 for adults and Rs 45 for children, and earned Rs 7300 in total.

i) Form two simultaneous equations.

[ /1]

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ii) How many tickets of each kind were sold?

[ /5]

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- b) Qasim wants to decorate his room’s front wall with marble tiles. If the area of the wall and a tiles are  $(a^4 - 6a - 4) \text{ m}^2$  and  $(a-2) \text{ m}^2$  respectively, find how many such tiles are required for the wall decoration?

[ /4]

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Q8.

- a) Mahira saves Rs 150000 and invests it at the end of the year at 5% compound interest. How much will her savings amount to after 2 years? [ /4]

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- b) A spherical scoop of strawberry ice-cream of radius 5 cm is placed in a cone. When the ice-cream melts, it fills two thirds of the cone. Find the volume of the cone. (Assuming no ice-cream drips outside the cone). [ /6]

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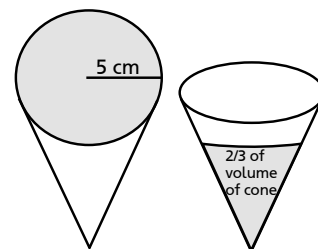
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Q9.

- a) Maheen draws a triangle with sides 5 cm, 12 cm, and 13 cm. Prove that Maheen draws a right angled triangle. [ /3]

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- b) If a ramp makes an angle of  $30^\circ$  with the road and rises up to a height of 3 m, how long is the ramp? [ /3]

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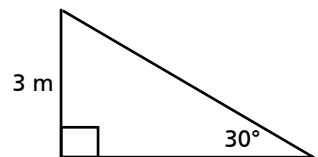
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- c) Solve  $\frac{x+2}{3} = 1 + \frac{3x-2}{5}$  [ /4]

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**Q10.**

- a) Shahryar buys a pair of shoes for Rs 2500 and sells them for Rs 3000. How much profit percentage does he earn? [ /3]

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- b) The number of goals scored by a hockey team in consecutive matches are respectively, 1, 5, 3, 1, 0, 2, 3, 2, 3, 5, 3, 2, 0, 1, 3, 3, 4, 2, 0, 1, 2

Construct a frequency table.

[ /3]

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- c) Find  $\Sigma f$  and  $\Sigma fx$ , and hence find the mean score.

[ /4]

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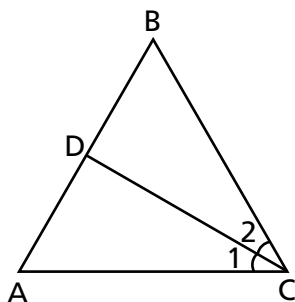


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QII.

- a) If the two sides of a triangle are congruent then prove that the angles opposite to these sides are also congruent. [ /5]

In the following figure  $\angle C$  is bisected into  $\angle 1$  and  $\angle 2$ .



Statements	Reasons

- b) Construct a regular pentagon with a side measuring 7 cm. [ /5]

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**[Total : /50]**

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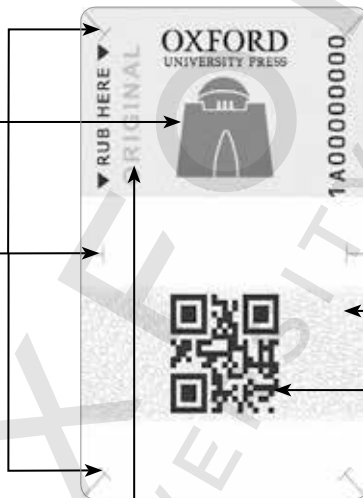
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