

# 10<sup>th</sup> Grade Multan Board

## Mathematics

2019

### Group A

#### MCQ SECTION

i) The number of terms in a standard quadratic equation  $ax^2+bx+c=0$  is:-

(Mark 1)

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

**Answer:**

C. 3

ii) If  $b^2-4ac<0$ , then the roots of  $ax^2+bx+c=0$  are:-

(Mark 1)

- A. Imaginary
- B. Rational
- C. Irrational
- D. Natural numbers

**Answer:**

A. Imaginary

iii) If  $\alpha, \beta$  are the roots of  $x^2-x-1=0$ , then product of the roots  $2\alpha$  and  $2\beta$  is:-

(Mark 1)

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

**Answer:**

B. -4

iv) If  $a:b = x:y$  then alternando property is:-

(Mark 1)

- A.  $a-b/x = x-y/y$
- B.  $a/b = x/y$

- C.  $a/x = b/y$
- D.  $a+b/b = x+y/y$

**Answer:**

- C.  $a/x = b/y$

**v) In a proportion  $a:b::c:d$ , a and d are called:-**

**(Mark 1)**

- A. Means
- B. Extremes
- C. Third proportional
- D. Fourth proportional

**Answer:**

- B. Extremes

**vi) The identity  $(5x+4)^2=25x^2+40x+16$  is true for:-**

**(Mark 1)**

- A. One value of x
- B. All values of x
- C. Two values of x
- D. Three values of x

**Answer:**

- B. All values of x

**vii) If  $A \subseteq B$ , then  $A-B$  is equal to:-**

**(Mark 1)**

- A. B
- B. A
- C.  $\emptyset$
- D. B-A

**Answer:**

- C.  $\emptyset$

**viii)  $(A \cup B) \cap C$  is equal to:-**

**(Mark 1)**

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

**Answer:**

- D.  $A \cup (B \cup C)$

**ix) The most frequent occurring observation in a data set is called:-**

**(Mark**

**1)**

- A. Mode
- B. Median
- C. Harmonic mean
- D. Men

**Answer:**

A. Mode

**x) If  $\tan\theta = \sqrt{3}$ , then  $\theta$  is equal to:-**

**(Mark 1)**

- A.  $90^\circ$
- B.  $30^\circ$
- C.  $45^\circ$
- D.  $60^\circ$

**Answer:**

D.  $60^\circ$

**xi)  $\sec^2\theta =$**

**(Mark 1)**

- A.  $1-\sin^2\theta$
- B.  $1+\cos^2\theta$
- C.  $1+\tan^2\theta$
- D.  $1-\tan^2\theta$

**Answer:**

C.  $1+\tan^2\theta$

**xii) Line segment joining any point of the circle to the centre is called:-**

**(Mark**

**1)**

- A. Circumference
- B. Diameter
- C. Perimeter
- D. Radial segment

**Answer:**

D. Radial segment

**xiii) A line which has only one point in common with a circle is called:-**

**(Mark**

**1)**

- A. Sine of circle
- B. Secant of circle
- C. Cosine of circle
- D. Tangent of a circle

**Answer:**

D. Tangent of a circle

**xiv) A pair of chords of a circle subtending two congruent central angles is:-**

**(Mark 1)**

A. Congruent

B. incongruent

C. Overlapping

D. Parallel

**Answer:**

A. Congruent

**xv) The measure of the external angle of a regular octagon is:- (Mark 1)**

A.  $\pi/4$

B.  $\pi/6$

C.  $\pi/3$

D.  $\pi/8$

**Answer:**

A.  $\pi/4$

## SHORT QUESTION SECTION

Q.2 i) Define Reciprocal Equation.

(Marks 2)

Q.2 ii) Write the equation in standard form.  $\frac{x+4}{x-2} - \frac{x-2}{x} + 4 = 0$

(Marks 2)

iii) If  $\alpha, \beta$  are the roots of the equation  $lx^2+mx+n=0$  then find the value of  $\alpha^3\beta^2+\alpha^2\beta^3$

(Marks 2)

iv) If  $\alpha, \beta$  are the roots of the equation,  $2x^2-3x-5=0$  form a quadratic equation having roots,  $2\alpha+1, 2\beta+1$

(Marks 2)

v) Solve by using synthetic division if 2 is the root of the equation  $x^3-28x+48=0$

(Marks 2)

vi) If  $\alpha, \beta$  are the roots of the equation  $x^2+px+q=0$  form an equation whose roots are  $\alpha^2, \beta^2$  (Marks 2)

vii) Find a third proportional to  $(x-y)^2, x^3-y^3$  (Marks 2)

viii) If  $V \propto R^3$  and  $V = 5$  when  $R = 3$ , find the value of  $K$ . (Marks 2)

ix) Define Inverse Variation. (Marks 2)

Q.3 i) Define Rational Fraction. (Marks 2)

ii) (Marks 2)

If  $A = \{0, 2, 4\}$ ,  $B = \{-1, 3\}$  then find  $A \times B$  and  $B \times A$ .

Q.3 iii) Find  $a$  and  $b$  if  $(3-2a, b-1) = (a-7, 2b+5)$  (Marks 2)

**iv) Define a Function.**

**(Marks 2)**

**v) If  $X = \{1,4,7,9\}$  and  $Y = \{2,4,5,9\}$  then find  $X \cap Y$  and  $X \cup Y$ .**

**(Marks 2)**

**vi) Find the geometric mean of the observations 2,4,8.**

**(Marks 2)**

**vii) Define Standard Deviation.**

**(Marks 2)**

**viii) Find arithmetic mean for the given data. 12, 14, 17, 20, 24, 29, 35, 45.**

**(Marks 2)**

**ix) Write the formulae to find median and mode from grouped data.**

**(Marks 2)**

**Q.4 i) Define Radian measure of an angle.**

**(Marks 2)**

**ii) Find  $\theta$ , when  $r = 2.5$  m,  $l = 4.5$  m.**

**(Marks 2)**

**iii) Define Obtuse Angle.**

**(Marks 2)**

**iv) Define Chord of a circle.**

**(Marks 2)**

**v) Define length of a tangent to a circle.**

**(Marks 2)**

**vi) Define segment of a circle.**

**(Marks 2)**

**vii) Define circumangle.**

**(Marks 2)**



**viii) Define a Polygon.**

**(Marks 2)**

**ix) Define Escribed Circle.**

**(Marks 2)**

## LONG QUESTION SECTION

Q.5 a) Solve the following equation using quadratic formula:-  
 $6x^2-3-7x=0$  (Marks 4)

Q.5 b) Prove that  $x^3+y^3+z^3-3xyz=(x+y+z)(x+\omega y+\omega^2z)(x+\omega^2+\omega z)$  (Marks 4)

Q.6 a) Using theorem of Componendo-dividendo, solve the equation (Marks 4)

$$\frac{\sqrt{x+3} + \sqrt{x-3}}{\sqrt{x+3} - \sqrt{x-3}} = \frac{4}{3}$$

Q.6 b) Resolve into Partial Fractions.  $\frac{7x+4}{(3x+2)(x+1)^2}$  (Marks 4)

Q.7 a)

If  $A = \{1,2,3,4,5,6\}$ ,  $B = \{2,4,6,8\}$  and  $C = \{1,4,8\}$  then prove that  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

(Marks 4)

**Q.7 b) Find the Harmonic mean for the following data:- (Marks 4)**

<b>Classes</b>	<b>No. of students</b>
33 - 40	28
41 - 50	31
51 - 60	12
61 - 70	9
71 - 75	5

**Q.8 a) Prove that  $\sin 3\theta = \sin\theta - \sin\theta\cos^2\theta$  (Marks 4)**

**Q.8 b) Inscribe a circle in a triangle ABC with sides  $|AB|= 5$  cm,  $|BC|= 3$  cm,  $|CA|= 3$  cm, (Marks 4)**

**Q.9) Prove that a straight line drawn from centre of a circle to bisect a chord (which is not a diameter ) is perpendicular to the chord. (Marks 8)**

**10<sup>th</sup> Grade Multan Board**

**Mathematics**

**2019**

**Group B**

**MCQ SECTION**

**i) An equation, which remains unchanged when  $x$  is replaced by  $1/x$  is called**

**a/an:-**

**(Mark 1)**

- A. Exponential equation
- B. Reciprocal equation
- C. Radical equation
- D. Quadratic equation

**Answer:**

B. Reciprocal equation

**ii) Product of cube roots of unity**

**is:-**

**(Mark 1)**

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

**Answer:**

C. 1

**iii)  $1/\alpha + 1/\beta$**

**= \_\_\_\_\_**

**(Mark 1)**

- A.  $1/\alpha$
- B.  $1/\alpha - 1/\beta$
- C.  $\alpha - \beta/\alpha\beta$
- D.  $\alpha + \beta/\alpha\beta$

**Answer:**

- D.  $\alpha + \beta/\alpha\beta$

**iv) If  $a:b = x:y$  then alternando property**

**is:-**

**(Mark 1)**

- A.  $a/x = b/y$
- B.  $a/b = x/y$
- C.  $a+b/b = x+y/y$
- D.  $a-b/b = x-y/y$

**Answer:**

- A.  $a/x = b/y$

**v) If  $a:b = x:y$  , then invertendo property**

**is:-**

**(Mark 1)**

- A.  $a/x = b/y$
- B.  $a/a-b = x/x-y$
- C.  $a+b/b = x+y/y$
- D.  $b/a = y/x$

**Answer:**

- D.  $b/a = y/x$

**vi) Partial fraction of  $x-2/(x-1)(x+2)$  are of the form:-**

**(Mark 1)**

- A.  $A/x-1 + B/x+2$
- B.  $Ax/x-1 + B/x+2$
- C.  $A/x-1 + Bx+C/x+2$
- D.  $Ax+B/x-1 + C/x+2$

**Answer:**

A.  $A/x-1 + B/x+2$

**vii) Point (-1,4) lies in the quadrant.**

**(Mark 1)**

A. I

B. III

C. II

D. IV

**Answer:**

C. II

**viii) If the number of elements in Set A is 3 and in set B is 2, then number of binary relations in  $A \times B$**

**is:-**

**(Mark 1)**

A.  $2^3$

B.  $2^8$

C.  $2^6$

D.  $2^2$

**Answer:**

C.  $2^6$

**ix) Mean is affected by change**

**in:-**

**(Mark 1)**

A. Value

B. Ratio

C. Origin

D. Proportion

**Answer:**

C. Origin

**x) The union of two non-collinear rays, which have common endpoint is called:-**

**(Mark 1)**

- A. An angle
- B. A degree
- C. A minute
- D. A radian

**Answer:**

- A. An angle

**xi)**

**Sec<sup>2</sup>θ= \_\_\_\_\_**

**(Mark 1)**

- A.  $1-\sin^2\theta$
- B.  $1+\tan^2\theta$
- C.  $1+\cos^2\theta$
- D.  $1-\tan^2\theta$

**Answer:**

- B.  $1+\tan^2\theta$

**xii) Locus of point in a plane equidistant from a fixed point**

**(Mark 1)**

- A. Radius
- B. Circle
- C. Circumference
- D. Diameter

**Answer:**

- B. Circle

**xiii) A line which has only one point in common with a circle is called:-**

**(Mark 1)**

- A. Sine of a circle
- B. Cosine of a circle
- C. Tangent of a circle
- D. Secant of a circle

**Answer:**

- C. Tangent of a circle

**xiv) A pair of chords of a circle subtending two congruent central angles**

**is:-**

**(Mark 1)**

- A. Congruent
- B. Incongruent
- C. Overlapping
- D. Parallel

**Answer:**

- A. Congruent

**xv) The length of the diameter of a circle is how many times the radius of the circle?**

**(Mark 1)**

- A. One time
- B. Two times
- C. Three times
- D. Four times

**Answer:**

- B. Two times



## SHORT QUESTION SECTION

**Q.2 i) Write down the names of two methods for solving quadratic equation. (Marks 2)**

**ii) Solve by factorization.  $x^2 - x - 20 = 0$  (Marks 2)**

**iii) Evaluate.  $(9 + 4\omega + 4\omega^2)^3$  (Marks 2)**

**iv)**

If  $\alpha, \beta$  are the roots of equation  $4x^2 - 5x + 6 = 0$ , then find the values of  $\alpha^2\beta^2$

**(Marks 2)**

**v) Prove that the sum of all cube roots of unity is zero. (Marks 2)**

**vi)**

Using synthetic division, find remainder and quotient when  $(x^3 + 3x^2 + 2) \div (x - 2)$

**(Marks 2)**

**vii) Define Proportion. (Marks 2)**

**viii) Find the value of 'x' if  $(3x-2):4::(2x+3):7$  (Marks 2)**

**ix) Find the cost of 8 kg mangoes if 5 kg of mangoes cost Rs. 250.**

**(Marks 2)**

**Q.3 i) Define Proper Fraction. (Marks 2)**

**ii) If  $X = \{1, 4, 7, 9\}$  and  $Y = \{2, 4, 5, 9\}$  then find  $X \cup Y$ . (Marks 2)**

**iii) If  $A = \{a, b\}$  and  $B = \{c, d\}$  then find  $A \times B$  (Marks 2)**

**iv) Define a subset and give one example. (Marks 2)**

**v) Write all the subsets of the set  $\{a, b\}$  (Marks 2)**

**vi) Define Standard Deviation. (Marks 2)**

**vii)**

Find Arithmetic Mean by Direct Method for the following data, 12, 14, 17, 20, 24, 29, 35, 45.

**(Marks 2)**

viii) The salaries of five teachers in rupees are as follows. Find range.  
11500,12400,15000,14500,14800 (Marks 2)

ix) Define Mode. (Marks 2)

Q.4 i) Define Angle of Depression. (Marks 2)

ii) Express angle  $315^\circ$  into radians. (Marks 2)

iii) Define Acute angle. (Marks 2)

iv) What is meant by Collinear Points? (Marks 2)

v) Define Secant. (Marks 2)

vi) Define Arc of a circle. (Marks 2)

vii) Differentiate between a Circle and a Circumference. (Marks 2)

viii) What is meant by Perimeter? (Marks 2)

ix) Define Circumscribed Circle. (Marks 2)

## LONG QUESTION SECTION

**Q.5 a) Solve the given equation by completing square.**

$$3x^2 + 7x = 0$$

**(Marks 4)**

**Q.5 b) If  $\alpha, \beta$  are the roots of the equation  $x^2 + px + q = 0$  then evaluate  $\alpha^2 + \beta^2$**

**(Marks 4)**

**Q.6 a)  $m \propto 1/n^3$  and  $m=2$ , when  $n=4$ , find  $m$  when  $n=6$  and find  $n$  when  $m=432$**

**(Marks 4)**

**Q.6 b) Resolve into partial Fraction.  $\frac{x^3 - 2x^2 - 2}{(x^2 + 1)^2}$**

**(Marks 4)**

**Q.7**

**a)**

If  $U = \{1, 2, 3, \dots, 10\}$ ,  $A = \{1, 3, 5, 7, 9\}$  and  $B = \{1, 4, 7, 10\}$  then verify that

$$B - A = B \cap A'$$

**(Marks 4)**

**Q.7 b) The following data relates to the ages of children in a school.**

**Compute the mean age.**

**(Marks 4)**

<b>Class Limits</b>	<b>Frequency</b>
4 - 6	10
7 - 9	20
10 - 12	13
13 - 15	7
Total	50

**Q.8 a) Verify the identity**

**(Marks 4)**

$$\frac{1 + \cos \theta}{\sin \theta} + \frac{\sin \theta}{1 + \cos \theta} = 2 \operatorname{cosec} \theta$$

**Q.8 b) Circumscribe a circle about an equilateral triangle ABC with each side of length 4 cm.**

**(Marks 4)**

**Q.9) Prove that if two chords of a circle are congruent then they will be equidistant from the centre.**

**(Marks 8)**