



**MODERN MIDDLE EAST INTERNATIONAL SCHOOL,  
RIYADH, K.S.A  
ACADEMIC YEAR 2022 – 2023**

<b>Name:</b>	<b>Grade: 10      Sec:</b>	<b>Date: 16.06.2022</b>
<b>Subject: Mathematics</b>	<b>Duration: 3 Hours</b>	<b>Maximum Marks: 80</b>

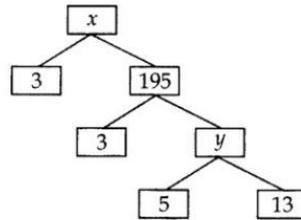
**General Instructions:**

1. Read the instructions carefully.
2. This question paper contains two parts A and B.  
Both Part A and Part B have internal choices.  
**Part – A:** It consists three sections- I ,II and III.
  1. **Section I** has **16 MCQs** of 1 mark each. *Internal choice is provided in 2 questions.*
  2. **Section II** has **16 Objective questions** of 1 mark each. *Internal choice is provided in 3 questions.*
  3. **Section III** has **4 questions on case study**. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.  
**Part – B:** It consists three sections- IV ,V and VI
  1. **Section IV** has Question No 37 to 40 are Very short answer Type questions of **2 marks** each,
  2. **Section V** has Question No 41 to 44 are Short Answer Type questions of **3 marks** each.
  3. **Section VI** has Question No 45 to 47 are Long Answer Type questions of **4 marks** each.
  4. *Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 4 marks.*
3. This question paper contains 7 printed pages.
4. All questions are compulsory.
5. You may attempt any section at a time. All questions of that particular section must be attempted in the correct order. Do not split sections.
6. All answers must be written in the separate sheets provided. Questions need not have to be copied in the answer sheet.

**PART-A**  
**SECTION – I**

**[16 X 1M = 16Marks]**

- 1) The HCF and the LCM of 24,15, 36 respectively are  
A).6, 140      B).12, 420      C).3, 360      D).420, 3
- 2) From the following factor tree, find the composite numbers x and y.



- A).585, 65    B).565,75    C).75,565    D).485,95

- 3) If two positive integers  $m$  and  $n$  are expressible in the form  $m = pq^3$  and  $n = p^3q^2$  where  $p, q$  are prime numbers, then HCF ( $m, n$ ) is \_\_\_\_\_
- A). $pq$                       B).  $pq^2$                       C).  $p^3q^3$                       D).  $p^2q^3$
- 4) If  $\alpha$  and  $\beta$  are the zeros of the polynomial  $2y^2 + 7y + 5$ , write the values of  $\alpha + \beta + \alpha\beta$ .
- A).0                      B). 1                      C). -1                      D). None of these
- 5) If one root of  $5x^2 + 13x + k = 0$  is the reciprocal of the other, then find the value of  $k$ .
- A). 3                      B). -3                      C). -5                      D). 5
- 6) Find the value of  $k$  such that the polynomial  $x^2 - (k + 6)x + 2(2k - 1)$  has sum of its zeros equal to half of their product.
- A) 6                      B). 5                      C). 7                      D). 8

**(OR)**

The number of polynomials having zeroes as -2 and 5 is

- A). 1                      B). 2                      C). 3                      D). more than 3
- 7) Solve the following pair of linear equations:  $3x+4y=10, 2x-2y=2$ .
- A). $x = 2, y = 1$                       B). $x = 1, y = 2$                       C).  $x = 2, y = 3$                       D). $x = 3, y = 2$
- 8) Perimeter of a rectangle whose length ( $l$ ) is 4 cm more than twice its breadth ( $b$ ) is 14 cm. The pair of linear equations representing the above information is
- A).  $l + 4 = 2b, 2(l + b) = 14$                       B).  $l - b = 4, 2(l + b) = 14$
- C).  $l = 2b + 4, l + b = 14$                       D).  $l = 2b + 4, 2(l + b) = 14$
- 9) For what value of 'a' will the equations  $2x+3y=13$  and  $3x+ay=18$  have no solution?
- A)2                      B).-4                      C).4                      D). $\frac{9}{2}$
- 10) How many terms of AP 18, 16, 14, .... be taken so that their sum is zero?

A).17 terms    B). 18 terms    C).19 terms    D).20 terms

11) 30<sup>th</sup> term of AP: 10,7,4,... is

A).97    B).77    C).-77    D).-87

12). For what value of k will k+9, 2k-1, 2k+7 are the consecutive terms of AP?

A).12    B). 14    C). 16    D). 18

13) If the distance between A(k,3) and B(2,3) is 5, then the value of k is:

A).5    B).6    C).7    D).8

14) If the point (x,4) lies on a circle whose center is at the origin and radius is 5, then x=\_\_\_\_\_

A).±5    B).±3    C).0    D).±4

15) The distance of the point P(-6,8) from the origin is

A).8 units    B).2 units    C). 10 units    D). 6 units

16) If the mid-point of the line segment joining the points A (3, 4) and B (k, 6) is P (x, y) and  $x + y - 10 = 0$ , find the value of k.

A) -7    B). 7    C). 5    D). 10

**(OR)**

The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is

A). 5    B).12    C). 11    D).  $7 + \sqrt{5}$

### **SECTION – II**

**[16 X 1M = 16Marks]**

**Solve the following objective questions:**

17) The H.C.F. of two co-prime numbers is \_\_\_\_\_

18) The HCF of two numbers a and b is 5 and their LCM is 200. Find the product ab.

19) The sum of two irrational numbers is always rational or irrational. (True/False).

20) Express 98 as a product of its primes.

21) State Fundamental Theorem of Arithmetic.

22) Find the zeroes of the polynomial  $x^2 + \frac{1}{6}x - 2$ .

23) If the sum of the squares of zeros of a quadratic polynomial  $f(x) = x^2 - 8x + k$  is 40, then find the value of k.

24) If the product of zeroes of the given polynomial  $ax^2 - 6x - 6$  is 4, find the value of a.

- 25) If -1 is the zero of the polynomial  $f(x) = x^2 - 7x - 8$ , then calculate the other zero.  
 26) Find the value of 'a' for which the pair of linear equations  $2x+3y=7$  and  $4x+ay=14$  has infinitely many solutions.

(OR)

The pair of equations  $x = a$  and  $y = b$  graphically represents lines which are \_\_\_\_\_.

- 27) The following list of numbers forms an AP . 2, 4, 8, 16, . . (True/False)  
 28) Write the next two terms of AP:

$$\sqrt{27}, \sqrt{48}, \sqrt{75}, \dots$$

- 29) Find the 9th term from the end(towards the first term) of AP 5, 9, 13, ... ,185.

(OR)

Which term of the AP : 3,8,13,18 ... , is 78?

- 30) The perpendicular distance of A(5,12) from the y-axis is \_\_\_\_\_  
 31) If four vertices of a parallelogram taken in order are (-3,-1), (a, b), (3,3) and (4,3), then a:b= \_\_\_\_\_  
 32) The line segment joining the points(-3,-4) and (1,-2) is divided by the y-axis in the ratio \_\_\_\_\_

(OR)

If point P divides the line segment AB in the ratio k:1, then the coordinates of the point P are \_\_\_\_\_

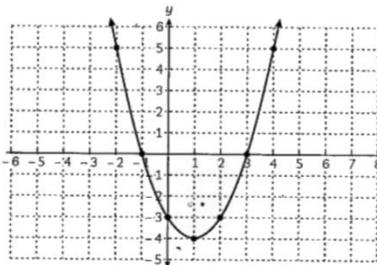
### SECTION – III

[4 X 4M = 16Marks]

**Attempt any four sub-parts from each case study question. Each sub-part carries one mark.**

#### 33) Case-Based Question-1:

Due to heavy storm an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following questions below.



Based on above information, answer the following:

- i). Name the shape in which the wire is bent.  
 A). Spiral                      B). Ellipse                      C). Linear                      D). Parabola
- ii). How many zeroes are there for the polynomial (shape of the wire)  
 A). 2                                  B). 3                                  C). 1                                  D). 0
- iii). The zeroes of the polynomial are  
 A). -1,5                              B). -1,3                              C). 3,5                              D). -4,2
- iv). What will be the expression of the polynomial?  
 A).  $x^2 + 2x - 3$                       B).  $x^2 - 2x + 3$   
 C).  $x^2 - 2x - 3$                       D).  $x^2 + 2x + 3$
- v). If the graph of a polynomial intersects the x-axis at only one point, it cannot be a quadratic polynomial.  
 A). True                              B). False

**34) Case-Based Question-2:**

A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year.



- i) Find the production in the 1st year.  
 A). 550                      B). 350                      C). 750                      D). 650
- ii) How much does the production increase uniformly each year?  
 A). 10                      B). 35                      C). 20                      D). 25
- iii) Find the production in the 10th year.  
 A). 400                      B). 200                      C). 775                      D). 850
- iv) What is the total production in first 7 years (in Rs.)?

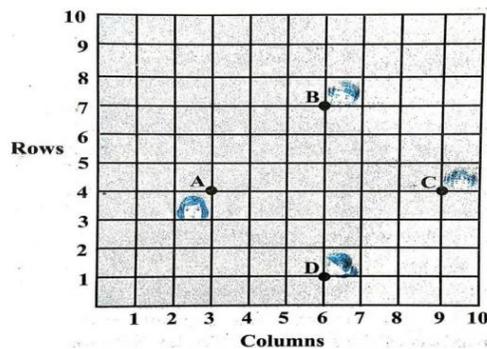
- A). 4375      B). 2365      C).1225      D). 565

v) In which year, the production is Rs.850 ?

- A). 6      B). 8      C). 10      D). 13

**35) Case-Based Question-3:**

In a class room, four students Sita, Gita, Rita and Anita are sitting at the positions A,B,C and D as shown in the figure. Then a new student Anjali joins the class. Teacher tells Anjali to sit in the middle of the four students.



i).What are the coordinates of Rita?

- A). (3,4)      B). (6,7)      C).(9,4)      D). (6,1)

ii).Teacher tells Anjali to sit in the middle of the four students.

- A). (6,4)      B). (4,4)      C). (5,4)      D). (2,4)

iii).Calculate the distance between Sita and Anita.

- A).  $4\sqrt{2}$ units      B).3 units      C).  $3\sqrt{2}$  units      D). 5 units

iv).Which two students are equidistant from Gita?

- A). Sita and Rita      B). Rita and Gita      C).Gita andAnita      D). Anita and Sita

v). The mid-point of the line segment joining the points A (-2, 8) and B (- 6, - 4) is

- A). (- 4, - 6)      B). (2, 6)      C). (- 4, 2)      D). (4, 2)

**36) Case-Based Question-4:**

Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks.



- i) The above situation can be represented using which pair of linear equation?  
 A).  $3x-y=40, 2x-y=25$                       B).  $x-y=10, x+2y=12$   
 C).  $x+3y=14, x+6y=16$                       D).  $x+5y=25, 2x-10y=40$
- ii) Number of correct answers are \_\_\_\_  
 A). 12                      B). 15                      C). 16                      D). 5
- iii) Number of wrong answers are \_\_\_\_  
 A). 5                      B). 10                      C). 20                      D). 15
- iv) How many questions were there in the test?  
 A). 10                      B). 30                      C). 20                      D). 35
- v) One equation of a pair of dependent linear equations is  $-5x + 7y = 2$ . The second equation can be \_\_\_\_  
 A).  $10x + 14y + 4 = 0$                       B).  $-10x - 14y + 4 = 0$   
 C).  $-10x + 14y + 4 = 0$                       D).  $10x - 14y = -4$

**PART-B**  
**SECTION – IV**

**[4 X 2M = 8Marks]**

37) A forester wants to plant 66 apple trees, 88 banana trees and 110 mango trees in equal rows (in terms of number of trees). Also he wants to make distinct rows of trees (i.e., only one type of trees in one row). Find the number of minimum rows required?

**(OR)**

Three bells toll at intervals of 12 minutes, 15 minutes and 18 minutes respectively. If they start tolling together, after what time will they next toll together?

38) Find the quadratic polynomial whose zeroes are -2 and -5. Verify the relationship between zeroes and coefficients of the polynomial.

39) Form a quadratic polynomial whose zeroes are  $3 + \sqrt{2}$  and  $3 - \sqrt{2}$ .

(OR)

Find a quadratic polynomial sum and product of whose zeros is  $\sqrt{2}$  and  $\frac{1}{3}$ .

40) Sumit is 3 times as old as his son. Five years later, he shall be two and half times as old as his son.  
How old is Sumit at present?

**SECTION – V**

**[4 X 3M = 12Marks]**

41) Prove that  $5 + 3\sqrt{2}$  is an irrational number, it being given that  $\sqrt{2}$  is irrational.

42) Draw the graphs of the pair of linear equations  $x - y + 2 = 0$  and  $4x - y - 4 = 0$ . Calculate the area of the triangle formed by the lines so drawn and the x-axis.

43) Solve the equation :  $1 + 5 + 9 + 13 + \dots + x = 1326$

(OR)

How many multiples of 4 lie between 10 and 250?

44) Find the ratio in which the line segment joining the points  $(-3, 10)$  and  $(6, -8)$  is divided by  $(-1, 6)$ .

(OR)

Find the area of the rhombus if its vertices are  $(3, 0), (4, 5), (-1, 4)$  and  $(-2, -1)$  taken in order.

**SECTION – VI**

**[3 X 4M = 12Marks]**

45) The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle.

(OR)

If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes  $\frac{1}{2}$  if we only add 1 to the denominator. What is the fraction?

- 46) The ratio of the 11th term of the 18th term of an AP is 2:3. Find the ratio of the 5th term to the 21st term and also the ratio of the sum of the first five terms to the sum of the first 21 terms.
- 47) Show that the points A(5,6),B(1,5),C(2,1) and D(6,2) are the vertices of a square.

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