MS-CIT
World-class Comprehensive Computer Course

Question Paper
Set- I
Std. – 10th EM/Semi
Subject – Algebra

MKCL KLiC Courses
Gateway to Knowledge Lit Careers

Time : 2 Hrs. **Marks : 40**

Q.1 A) Solve multiple choice questions. **4**

1) What is the amount of dividend received per share of face value Rs. 100 on dividend declared is 2%
a. Rs. 20 b. Rs. 2 c. Rs. 8 d. Rs. 12

2) If the classes of a frequency distribution are 1 - 10, 11 - 20, 21 - 30,……, 61 - 70, then the upper limit of the class 11 - 20 is
a. 20 b. 21 c. 19.5 d. 20.5

3) Which of the following is a quadratic equation?
a. $(x - 2) (x + 1) = (x - 1) (x - 3)$
b. $(x + 2)^3 = 2x (x^2 - 1)$
c. $x^2 + 3x + 1 = (x - 2)^2$
d. $8(x - 2)^3 = (2x - 1)^3 + 3$

4) The 30^{th} term of the A.P 10, 7, 4….. is
a. 87 b. 77 c. -77 d. -87

B) Solve the following questions. **4**

1) Compare the given quadratic equations to the general form and write values of a, b, c.
$x^2 - 7x + 5 = 0$

2) Write an A.P. whose first term is a and common difference is d in each of the following.
$a = - 3, d = 0$

3) How many possibilities are there in the following event ?
One number from 10 to 20 is written on each card. Select one card randomly.

4) 'Pawan Medical' supplies medicines. On some medicines the rate of GST is 12%, then what is the rate of CGST and SGST?

Q.2 A) Complete the following Activities. (Any Two) **4**

1) If one root of the quadratic equation $5m^2 + 2m + k = 0$ is $\frac{-7}{5}$ then find the value of k by completing the following activity.
$\frac{-7}{5}$ is the root of equation $5m^2 + 2m + k = 0$
$\therefore$ $\frac{-7}{5}$ is satisfies the given equation.
Substituting $m = \frac{-7}{5}$ in given equation.
$\therefore 5 \times$ _____ $+ 2 \times$ _____ $+ k = 0$
$\therefore$ _____ + ____ $+ k = 0$
$\therefore 7 + k = 0$
$\therefore k =$ _____

2) The maximum bowling speed (km/h) of 33 players at a cricket coaching center is given in the following table. Find the modal bowling speed of a player.

Bowling speed (km/h)	Number of players frequency
85 - 100	9
100 - 115	11
115 - 130	8
130 - 145	5

Here, L = 100, f_m = 11, f_1 = 9, f_2 = 8, h = 15

Mode = ☐ ……. (Formula)

= 100 + $\left[\frac{11-9}{2(11)-9-8}\right] \times 15$ ……. (Substituting the values)

= 100 + ☐ × 15

= 100 + ☐

= 100 + 6 = ☐

The modal bowling speed of a player is _____km/h.

3) Two dice are rolled simultaneously. Find the probability that
i. The sum of the numbers on their upper faces is at the most 5.
ii. The sum of the numbers on their upper faces is at the least 6.

i. n (S) = 36
n (A) = 10
P (A) = ☐
= $\frac{10}{36}$
= ☐

ii. n (S) = 36
n (A) = 26
P A) = ☐
= $\frac{26}{36}$
= ☐

B) Solve the following questions. (Any four) **8**

1) The following table shows classification of number of workers and the number of hours they work in a software company. Find the median of the number of hours they work.

Daily No. of hours	8 - 10	10 - 12	12 - 14	14 - 16
Number of workers	150	500	300	50

2) Solve the following simultaneous equations.
x + 7y = 10 ; 3x - 2y = 7

3) Savita and Hamida are friends, what is the probability that both will have:
i. Different birthdays?
ii. The same birthday (Ignoring a leap year)?

4) Find the value of discriminant for each of the following equations.
$\sqrt{5}x^2 - x - \sqrt{5} = 0$

5) Find the sum of first 100 terms of an A.P. 14, 16, 18, ...

Q.3 A) Complete the following Activity (Any one) **3**

1) Solve the following simultaneous equations.
5x + 3y = 9 …. I
2x – 3y = 12 …..II
Adding equation I and II
5x + 3y = 9
2x – 3y = 12
7x = 21
x = ☐
Place x = 3 in equation I
5 × ☐ + 3y = 9
∴ 3y = 9 - ☐
∴ 3y = ☐

$\therefore$ y = ☐

(x, y) = (☐, ☐) is the solution of given simultaneous equations.

2) Form the quadratic equation from its roots.

3 and – 10

Let α and β are the roots of the quadratic equation.

Let α = 3 and β = ☐

$\therefore$ ☐ = 3 + (- 10) = - 7 and

☐ 3×- 10 = ☐

Then required quadratic equation is

$\therefore$ ☐ = 0

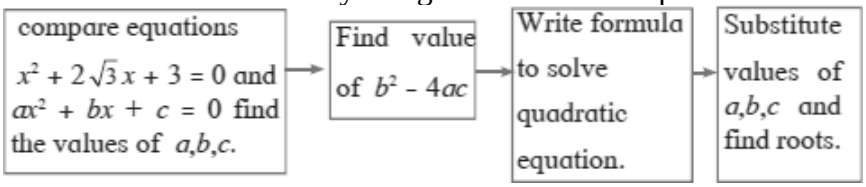
$\therefore$ x^2 - (- 7)x - 30 = 0

$\therefore$ ☐ = 0

B) Solve the following questions. (Any two) **6**

1) Shri. Aditya Sanghavi invested Rs. 50,118 in shares of FV Rs. 100, when the market value is Rs. 50. Rate of brokerage is 0.2% and Rate of GST on brokerage is 18%, then How many shares were purchased for Rs. 50,118?

2) Solve $x^2 + 2\sqrt{3}x + 3 = 0$ by using formula and complete the following flow chart.



3) Write sample space 'S' and number of sample point n(S) for each of the following experiments. Also write events A, B, C in the set form and write n(A), n(B), n(C).

Two digit numbers are formed using digits 0, 1, 2, 3, 4, 5 without repetition of the digits.

Condition for event A : The number formed is even

Condition for event B : The number formed is divisible by 3.

Condition for event C : The number formed is greater than 50.

4) Find t_n for following A.P. and then find 30^{th} term of A.P. 3, 8, 13, 18, ...

Q.4 Solve the following questions. (Any two) **8**

1) Two taps A and B can together fill a swimming pool in 15 days. A and B are kept open for 12 days and then B is closed. It takes another 8 days for the pool to be filled. How many days does each tap require to fill the pool?

2) The following is the frequency distribution of blood pressure measured for patients Draw a frequency polygon.

Blood pressure (in suitable units)	110 - 115	115 - 120	120 - 125	125 - 130	130 - 135
Number of patients	5	35	50	20	5

3) Smt. Mita Agrawal invested Rs. 10,200 when MV of the share is Rs. 100. She sold 60 shares when the MV was Rs. 125 and sold remaining shares when the MV was Rs. 90. She paid 0.1% brokerage for each trading. Find whether she made profit or loss? and how much?

Q.5 Solve the following questions. (Any one) **3**

1) The following is the component wise expenditure per article:

Component	Expenditure (in Rs.)
Raw material	800
Labour	300
Transportation	100
Packing	100
Taxes	140

Draw a pie diagram.

2) To solve the simultaneous equations by determinant method. $y + 2x - 19 = 0$; $2x - 3y + 3 = 0$