RBK School, Mira Road
(Managed by Babubhai Kanakia Foundation)
School Code: MA069

FIRST TERM EXAM 2019 – 20

Std: X

Marks: 80

Date: 16/10/19 Subject: Mathematics Dur. : 2 Hrs 30 mins

Section A : Attempt all questions from this section.

Q.1)

a) In a G.P., 3rd term is 24 and 6th term is 192. Find the 10th term. (3)

b) If $\frac{a}{b} = \frac{c}{d}$, show that $\frac{a+b}{c+d} = \frac{\sqrt{a^2+b^2}}{\sqrt{c^2+d^2}}$ (3)

c) Show that $(x-1)$ is a factor of $x^3 - 7x^2 + 14x - 8$. Hence, completely factorise the above expression. (4)

Q.2)

a) Find the values of x, which satisfies the following inequation. (3)

$-2 \leq \frac{1}{2} - \frac{2x}{3} \leq 1\frac{5}{6}, x \in N.$

Graph the solution set on the number line. (3)

b) Cards are marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the Probability that the number on the card is :
i) a number less than 14.
ii) a multiple of 5 and 6.
iii) a number which is a perfect square. (4)

c) A wholesaler buys a TV from a manufacturer for Rs.40,000. He marks the price of the TV 20 % above the cost price and sells to a Retailer at a discount of 10 % on the marked price. If the rate of GST is 28 %,
find : i) the marked price
ii) retailers cost inclusive of tax.
iii) GST paid by wholesaler.

Q.3)

a) Sameer deposited Rs.1500 per month in a recurring deposit scheme for 9 months If he gets Rs.675 as interest at the time of maturity , find the rate of interest. Also find the maturity value of the deposits. (3)

b) Find the matrix X such that $-A + 3B + X = 0$, where A= $\begin{bmatrix} -2 & 6 \\ 5 & 8 \end{bmatrix}$, B= $\begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix}$. (3)

c) Attempt this question on the graph paper. Plot A(2,5) and B(-2,-3). Use 2 cm = 1 unit on both axes (4)

i) Reflect A in x-axis to get A'

ii) B' is the image of B when reflected in y-axis , followed by reflection in the origin

iii) find the area of the AA'BB'.

Q.4)

(3)

a) A man wants to buy 82 shares available at Rs.132 (par value is Rs.100)

i) how much should he invest ?

ii) if the dividend declared id 7.5 % . what will be his annual income ?

iii) If he wants to increase his annual income by Rs. 450 . how many extra shares should he buy ?

(3)

b)Determine the ratio in which the point P(m,6) divides the join of A(-4,3) and B(2,8). Also find the value of m.

(4)

c) How many terms of the A.P. 63, 60, 57..... must be taken so that their sum is 693 ?

Section B : Attempt any four questions from this section.

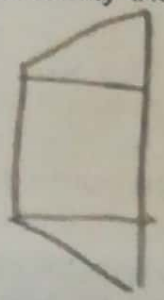
Q.5)

(3)

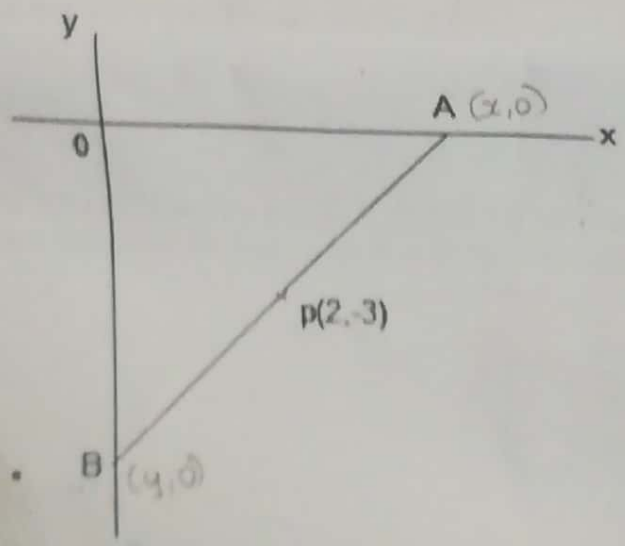
a) If two digits numbers are made with 3,5,7, and 9, what is the probability that the number is – i) greater than 55

ii) a prime number.

b)



(3)



A and B are the two points on the x-axis and y-axis respectively.P(2,-3) is the midpoint of AB.

Find : i) co-ordinates of A and B.

ii) Equation of line AB

c) Find the value of p if mean of the following distribution is 18. (4)

x	13	15	17	19	20+p	23
f	8	2	3	4	5p	6

6) a)The monthly income of a group of 320 employees in a company is given below :(6)

Monthly Income in Rs.	Number of Employees
6000-7000	20
7000-8000	45
8000-9000	65
9000-10000	95
10000-11000	60
11000-12000	30
12000-13000	5

Draw an ogive for the given distribution on a graph sheet taking 1 cm = 1000 on the x-axis and 1 cm=50 employees on the other axis. From the graph determine :

i) The median wage .
ii) The number of employees whose income is below Rs.8500.
iii) If the salary of senior employees is above Rs. 11500. Find the number of senior employees in the company.
iv) The upper quartile. (4)

b) A train travels a distance of 300 km at a constant speed of the train is increased by 5 km an hour , the journey would have taken 2 hours less. Find the original speed of the train.

Q.7) a)Solve the following equation and give your answer correct to two significant figures. (3)

$(x-4)^2 - 5x - 3 = 0$

b) For the following frequency distribution, draw a Histogram (3)

and estimate the mode.

Class	0-5	5-10	10-15	15-20	20-25	25-30
Frequency	2	7	18	10	8	5

c) A man invested 90000 in 15 % Rs.100 shares quoted at Rs.125. When the market value of these shares rose to Rs.140, he sold some shares just enough to raise Rs.16800.

Calculate : i) the number of shares he still holds (4)
ii) the dividend due to him on these shares.

Q.8)

a) A factory produces 1200 units in the third year and 1400 units in the seventh year. Assuming that the production increases uniformly by a fixed number year, find the production in i) the first year

ii) 8 years. (3)

b) Solve the following inequation and represent the solution set on the real number line.

$-2\frac{2}{3} \leq x + \frac{1}{3} < 3\frac{1}{3}, x \in R.$ $-3 \leq x < 3$ (3)

c) The line segment joining P(5,-2) and Q(9,6) is divided in the ratio 3 : 1 by a point A on it. Find the equation of a line through the point A and perpendicular to the line $x - 3y + 4 = 0$. (4)

Q.9)

a) Ramesh has a recurring deposit account in a bank for 5 years at 9% p.a. At the time of maturity he gets Rs.51,607.50 . Find the monthly deposit. (3)

b) Without solving the quadratic equation, find the value of m for which the given equation has real and equal roots.

$x^2 + 2(m-1)x + (m+5) = 0.$ (3)

c) How many terms of G.P. 3, $\frac{3}{2}, \frac{3}{4}, \ldots\ldots$ are needed to give the sum $\frac{186}{32}$? (4)

Q.10)

a) A dealer buys an article at a discount of 30 % from the wholesaler , the marked price being Rs.6000. The dealer sells it to the shopkeeper at a discount of 10 % on the marked price. If the rate of GST is 6 % Find : (3)

i) the price paid by shopkeeper including the tax.

ii) the GST paid by the dealer.

b) If $x^3 + ax^2 - x + b$ has $(x-2)$ is a factor and leaves a remainder 3 when divided by $(x-3)$, find a and b. (3)

c) Solve for x, using the properties of proportion. (4)

$$\frac{\sqrt{5} + \sqrt{5-x}}{\sqrt{5} - \sqrt{5-x}} = 3$$

Q.11)

a) The midpoint of a line segment joining (2a,4)and (-2,3b) is (1, 2a+1), find the values of a and b. Also write the coordinates of a midpoint. (3)

b) Determine the mean of the following frequency distribution by Short cut method:(3)

Class Intervals	10-16	16-22	22-28	28-34	34-40
frequency	1	10	5	3	6

c) Find the matrix X which satisfies the equation : (4)

$$\begin{bmatrix} 3 & 7 \\ 2 & 4 \end{bmatrix} \begin{bmatrix} 0 & 2 \\ 5 & 3 \end{bmatrix} + 2X = \begin{bmatrix} 1 & -5 \\ -4 & 6 \end{bmatrix}$$