

City International School

FIRST TERMINAL EXAMINATION - 2015 – 2016

Date : 10/08/2015

Marks : 80

Std : X

Subject : Mathematics

Time : 2½ hrs

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answers.

Attempt all questions from Section A and any four questions from Section B.

- All working including rough work must be clearly shown and must be done on the same sheet as the rest of the answers.
- Omission of essential working will result in loss of marks.

The intended marks for questions or parts of questions are given in brackets ()

Mathematical tables are provided.

SECTION A [40 MARKS]

Attempt all questions in this section.

Q. 1 a. Find x and y if $\begin{bmatrix} 2 & 3 \\ x & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix} + \begin{bmatrix} 3y \\ 2 \end{bmatrix} = \begin{bmatrix} -2 \\ 3 \end{bmatrix}$ (3)

- b. If the compound interest on a certain sum of money for the second and third year are ₹550 and ₹605 respectively, find (3)

- i. The rate of interest ii. The sum of money

- c. Two coins are tossed simultaneously. Find the probability of getting, (4)

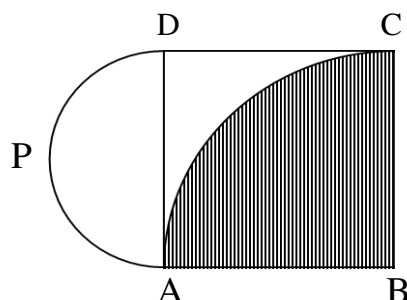
- i. At most 2 heads ii. No heads
iii. Exactly 2 heads iv. At least one head

- Q. 2** a. Find the values of x which satisfy the inequation: (3)

$$x - 4 < \frac{1}{3} (x - 6) \leq \frac{1}{2} \left(\frac{3x}{2} + 4 \right); X \in I$$

Graph your solution on the number line.

- b. In the figure given below, ABCD is a square of side 7cm. Find the area of the unshaded part if APD is a semi – circle and CAB is a quadrant. (3)



- b. If $x + 1$ is a factor of $4x^3 + ax^2 + bx + 3$ and when the expression is divided by $(x + 2)$, it leaves the remainder (-3) , find the values of a and b. (4)

Q. 3 a. Without using trigonometric tables evaluate , (3)

$$\sin 37^\circ \cdot \cos 53^\circ + \frac{1}{\operatorname{cosec} 53^\circ \cdot \sec 37^\circ} + 2 \sec^2 45^\circ - 5$$

b. Find the mean, mode and median of the following distribution. (3)
8, 10, 7, 6, 10, 11, 6, 13, 10

c. Draw a histogram from the following distribution and estimate the mode from the graph. (4)

Class	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35
Frequency	5	18	14	8	5	4

Q. 4 a. Find the value of p if the lines whose equations are $2x - y + 5 = 0$ and $px + 3y = 4$ are perpendicular to each other. (3)

b. Construct $\triangle ABC$, given that $BC = 5\text{cm}$, $\angle B = 60^\circ$ and $CA = 4.5\text{cm}$. Construct a circle touching the sides of $\triangle ABC$. Write its radius. (3)

c. Use the factor theorem to factorize completely, $x^3 + x^2 - 4x - 4$ (4)

SECTION B [40 MARKS]

Attempt any four questions from this section.

Q. 5 a. Use a graph paper for this question. (5)

- Plot the points A(-2, 0), B(-2, 4), C(1, 4) and D(1, 0).
- Reflect the points A, B in the line CD and obtain the points A' , B' .
- Give the specific name to the figure $ABB'A'$.
- Write the equation of its line of symmetry.
- Find the perimeter of the figure.

b. The entries in a saving bank pass book are as follows. (5)

Date	Particulars	Debit	Credit	Balance
01.01.13	B/F	-	-	5000
04.03.13	To Self	1000	-	-
06.07.13	By Cash	-	3000	-
08.09.13	By Cheque	-	1000	-

The account holder closes his account on 28.12.13 and receives an interest of ₹160, find the rate of interest paid by the Bank.

Q. 6 a. Solve the following quadratic equation by using the quadratic formula correct to 3 significant figures. $3x^2 - 7x + \frac{1}{2} = 0$ (3)

b. If $A \times \begin{bmatrix} 3 & 4 \\ 1 & -2 \end{bmatrix} = \begin{bmatrix} 3 & 14 \end{bmatrix}$ i. find the order of matrix A (3)
ii. The matrix A

c. On a certain sum of money, the difference between the compound interest for a year payable half yearly and the simple interest for a year is ₹180. Find, the sum lent out, if the rate of interest in both the cases is 10% p.a. (4)

Q. 7 a. David opened a recurring deposit account in a bank and deposited ₹300 per month for 2 years. If he received ₹7725 at the time of maturity, find the rate of interest per annum. (3)

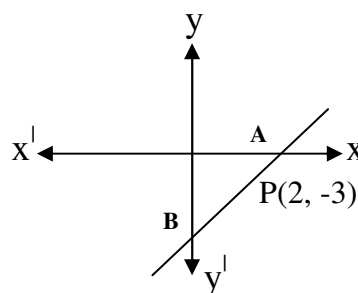
b. $A = \{x : 3 < 2x - 1 < 9, X \in R\}$ $B = \{x : 11 \leq 3x + 2 \leq 23, X \in R\}$ (3)
Represent A, B on separate number lines. Write the set $A \cup B$

c. A, B and two points on the X axis and Y axis respectively. (4)
If P(2, -3) is the midpoint of AB, then find

i. The co-ordinates of A and B

ii. Slope of line AB

iii. Equation of line XX'



Q. 8 a. ABC is a triangle and G(4, 3) is the centroid of the triangle. (4)
If A(1, 3), B(4, b) and C(a, 1) are the vertices of the triangle, find a and b.
Find the length of side BC

b. Marks obtained by 200 students in an examination are given below. (6)

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of Students	5	11	10	20	28	37	40	29	14	6

Draw an ogive for the given distribution taking 2cm = 10 marks on one axis and 2cm = 20students on the other axis. Using the graph, determine:

i. The median marks

ii. The number of students who failed if minimum marks required to pass is 40.

iii. If scoring 85 and more marks is considered as grade one, find the number of students who secured grade one in the examination.

- Q. 9** a. The weight of 50 apples was recorded as given below. Calculate the mean weight to the nearest gram, by the step deviation method. **(3)**

Weight (in gms)	80-85	85-90	90-95	95-100	100-105	105-110	110-115
No. of apples	5	8	10	12	8	4	3

- b. From a pack of 52 playing cards, all cards, whose numbers are multiples of 3, are removed. A card is now drawn at random. What is the probability that the card drawn is,
- A face card
 - An even numbered red card

- c. $A = \begin{bmatrix} 4 & 4 \\ -2 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 1 \\ 3 & -2 \end{bmatrix}$ Find a matrix D such that **(4)**

$$A^2 - 2B + 2D = 0$$