



*Answer **Question 1** from section A and 10 questions from Section B.*

All working, including rough work, should be done on the same sheet as, and adjacent to, the rest of the answer.

The intended marks for questions or parts of questions are given in brackets [].

The use of calculator (fx-82/fx-100) is allowed.

Section A (30 marks)

Answer ALL questions

Directions: Read the following questions carefully. For each question there are four alternatives A, B, C and D, choose the correct alternative and write it in your answer sheet.

Question 1

[15 * 2 = 30]

- i. The roots of the equation $x^2 - 3x = 0$ are

A 0, 3	B 0, -3
C 1, -3	D 1, 3
- ii. If $\log_5 a = 3$, the value of a is

A 15	B 891
C 152	D 125
- iii. The seventh term of the sequence 2, 4, 8, is

A 120	B 128
C 134	D 132
- iv. The lower quartile of 30, 50, 60, 90, 80, 40, 70 is

A 30	B 90
C 40	D 60
- v. If $\sum x = 256$ and $n = 10$, then the value of \bar{x} is

A 26.5	B 25.6
C 256	D 265
- vi. The seventeenth term of 2, 7, 12, is

A 32	B 128
C 82	D 160
- vii. The value of $2^{2-\log_2 5}$ is:

A $\frac{4}{5}$	B $\frac{5}{4}$
C $-\frac{4}{5}$	D $-\frac{5}{4}$
- viii. The simplified form of $\sqrt{-8}$ is

A $2\sqrt{2}i$	B $2i\sqrt{2}$
C $4i$	D $3\sqrt{2}i$
- ix. Which of the following is the range of the data 8, 10, 3, 4, 5, 15, 10

A 2	B 7
C 8	D 12

- x. The median of first 6 natural numbers is
A 3.5 **B** 3
C 2.5 **D** 2
- xi. The value of $\frac{3x^0 - 1}{3x^0 + 1}$ is
A $\frac{1}{2}$ **B** -1
C $\frac{2}{3}$ **D** $-\frac{1}{4}$
- xii. If $\sigma = 2.8$, $\bar{x} = 23$. The value of *C.V* is
A 23% **B** 12.17%
C 21.74% **D** 15%
- xiii. The mean of the numbers 6, 7, *x*, 14 is 8, then the value of *x* is
A 8 **B** 7
C 6 **D** 5
- xiv. The sum of the series $16 - 8 + 4 - \dots$ to infinity is
A $\frac{3}{32}$ **B** $-\frac{3}{32}$
C $\frac{32}{3}$ **D** 32
- xv. The value of $\log(y^2) \div \log y$ is
A $\log y$ **B** $\log y^3$
C 3 **D** 2

Section B (70 marks)

Answer any **10** questions. All questions in this section have equal marks.
 Unless otherwise stated, you may round your answer to 2 decimal points.

Question 2

- a) Calculate an arithmetic mean of the following data. [3]

Marks	2	7	12	10
Frequency	4	5	7	12

- b) The 5th term of an A.P is 11 and the 9th term is 7. Find the 16th term. [4]

Question 3

- a) Evaluate $\log_2 40 - \log_2 5$ [3]

- b) Compute the mean from the following table: [4]

Class Interval	0—10	10—20	20—30	30—40	40—50	50—60
No. of students	2	7	12	10	5	4

Question 4

- a) The sum to 20 terms of $2 + 6 + 18 + \dots$ [3]
- b) The following are the marks scored by 50 students. Find the standard deviation [4]

Marks	0—10	10—20	20—30	30—40	40—50
No. of students	3	5	7	3	2

Question 5

- a) Solve: $4x^2 - 3x - 1 = 0$. [3]
- b) Find the value of $\log_3\left(1 + \frac{1}{3}\right) + \log_3\left(1 + \frac{1}{4}\right) + \dots + \log_3\left(1 + \frac{1}{80}\right)$ [4]

Question 6

- a) The second term of a G.P is 18 and the fifth term is 486. Find the first term and the common ratio. [3]
- b) Calculate variance from the data given below: [4]

X	2	4	6	8
F	2	5	6	2

Question 7

- a) Calculate the median from the following data: [3]

Size of shoes	4	5	6	7	8
Frequency	10	22	40	10	7

- b) Solve $\frac{x}{5} + \frac{28}{x+2} = 5$ using factorization method. [4]

Question 8

- a) Calculate standard deviation from the following data [3]
2, 4, 6, 8, 10
- b) Find the value of m , if [4]
 - i) $\log_5(2m+5) = 3$
 - ii) $\log_m \frac{1}{26} = -\frac{2}{3}$

Question 9

- a) Which term of the series 5, 8, 11, is 320? [3]
- b) Find upper quartile for the following frequency distribution: [4]

Marks	10—20	20—30	30—40	40—50	50—60	60—70	70—80
No. of students	2	3	11	21	10	4	5

Question 10

- a) Find the roots of the equation $2(x^2 + 1) = 5x$ [3]
- b) The frequency distribution of marks obtained by 40 students of a class is as under. Calculate the median [4]

Marks	0—8	8—16	16—24	24—32	32—40	40—48
students	5	3	10	16	4	2

Question 11

- a) Solve for x : $\log_2(\log_9 3) = \log_x 6$ [3]
- b) The sum of 30 terms of a series in A.P. whose last term is 98 is 1635. Find the first term and the common difference. [4]

Question 12

- a) Solve: $6x^2 + 7x - 20 = 0$. [3]
- b) Calculate inter-quartile range from the following frequency distribution [4]

Wages	8	6	10	4	9	5
Frequency	9	8	9	6	3	7

Question 13

- a) Simplify $\frac{1}{2} \log_{10} 25 - 2 \log_{10} 3 + \log_{10} 18$ [3]
- b) Find the sum of the series $81 - 27 + 9 - \dots - \frac{1}{27}$. [4]

Question 14

- a) Solve $15x^2 - 28 = x$ using quadratic formula. [3]
- b) Compute Quartile Deviation from the following data. [4]
11, 15, 16, 9, 14, 19, 10, 12, 8, 17, 20, 23, 22