

MATH 2

In numerical work, take g to be 9.8 ms^{-2}

SECTION A (40 MARKS)

Answer all questions in this section.

1. The numbers $a, b, 8, 5, 7$ have mean and variance 2. Find the value of a and b if $a > 2$ (5 marks).
2. A class performed an experiment to estimate the diameter of a circular object. A sample of five students had the following results in centimetres;
3.12, 3.16, 2.94, 3.33 and 3.0
 - (a) mean
 - (b) standard deviation
3. Show that the root of the equation $2x - 3 \cos\left(\frac{x}{2}\right) = 0$ lies between 1 and 2
(5 marks)
4. The table below shows the values of a function $f(x)$.

x	1.8	2.0	2.2	2.4
$f(x)$	0.532	0.484	0.436	0.384

Use linear interpolation to find the value of

(a) $f(2.08)$

(b) x corresponding to $f(x) = 0.5$ (5 marks)

5. A group of 20 people played a game. The table below shows frequency distribution of their scores

Scores	1	2	4	x
Number of people	2	5	7	6

Given that the mean score is 5, find the:

- a). value of x

b). variance of the distribution.

(5 marks)

SECTION B (60 Marks)

6. The table below shows the marks obtained by students in a physical test.

Marks (%)	Frequency
25 – 29	9
30 – 34	12
35 – 39	10
40 – 44	17
45 – 49	13
50 – 54	25
55 – 59	18
60 – 64	14
65 – 69	8
70 – 74	8

(a) Draw a histogram and use it to estimate the modal mark. (04 marks)

(b) Find the:

(i) Mean mark, (05 marks)

Standard deviation. (03 marks)

7. The cumulative frequency table below shows the ages in years of employees of a certain company.

Age (years)	<15	<20	<30	<40	<50	<60	<65
Cumulative frequency	0	17	39	69	87	92	98

(a) (i) Use the data in the table to draw a cumulative frequency curve

(Ogive),

(ii) Use the curve to estimate the semi- interquartile range.

(06 marks)

(b) Calculate the mean age of the employees.

(06 marks)

8. Show that the root of the equation $f(x) = e^x + x^3 - 4x = 0$ lies between 1 and 2. By using linear interpolation find the root of the equation to two decimal places.

1. The table below shows the values of a continuous function f with respect to t .

t	0	0.3	0.6	1.2	1.8
$F(t)$	2.72	3.00	3.32	4.06	4.95

Using linear interpolation find:

(a) $f(t)$ when $t = 0.9$,

(b) t when $f(t) = 4.48$.

(12 marks)