



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
SCIENCE AND TECHNOLOGY DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

INFORMATION TECHNOLOGY

SUBJECT: Computer Quantitative Methods PAPER NO: 553/S06

DURATION: 3 Hours

OCTOBER / NOVEMBER 2014 EXAMINATION

REQUIREMENTS

1. Statistical Formulae and Tables
2. Graph paper
3. Non programmable calculator

INSTRUCTIONS TO CANDIDATE

Answer all questions.

This paper consists of 3 printed pages.

QUESTION 1

a) Given that $f(x) = \frac{(x+1)}{(x-2)}$

Find:

i) $f(-1)$

(2 marks)

ii) $f^{-1}(x)$

(4 marks)

b) Solve the following systems of linear equations:

$$x + 2y + 3z = 1$$

$$-x + 2z = 2$$

$$-2y + z = -2$$

(10 marks)

c) Given the set of numbers {5, 10, 12, 8, 4, 10, 2, 11}

Find:

- i) Mean
ii) Median
iii) Mode

$$4x(1+3x) = 0$$

(1 mark)

(2 marks)

(1 mark)

$$4x = 0 / 1+3x$$

$$4x + 12x^2 = 0$$

$$4 + 24x = 0$$

$$\frac{24x}{24} = \frac{-4}{24}$$

$$x = 0.167$$

QUESTION 2

a) Find the stationary points on the graph of $y = 2x^2 + 4x^3$ and state their nature.

(6 marks)

b) Evaluate $\int \ln x dx$

(8 marks)

c) Differentiate $xy + 4x = 4$ with respect to x .

(6 marks)

QUESTION 3

a) Find the number of ways to take 4 people and place them in groups of 3 at a time where order does not matter.

(4 marks)

b) At Kennedy middle school, the probability that a student takes Technology and Spanish is 0,087. The probability that a student takes Technology is 0,68. Calculate the probability that a student takes Spanish given that the student is taking Technology.

(4 marks)

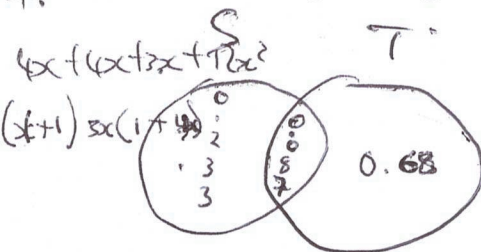
$$4x(1+3x) = 0$$

$$4x - 6 - 2$$

$$4 \cdot 3 \cdot 12x^3$$

$$4x$$

$$4.$$



$$4x + 6x + 2x + 12x^2$$

$$2x(1+3) + 2x(1+6x)$$

$$4x = 0$$

$$x = 0$$

$$\text{max. } \angle$$

$$1 - (0.087 + 0.68)$$

Nature

PAPER NO: 553/S06 – COMPUTER QUANTITATIVE METHODS

- c) Sixty-two percent of grade seven pupils attend school in a particular urban school district. If a sample of 500 grade seven pupils are selected. Find the probability that at least 290 are actually enrolled in school. (12 marks)

QUESTION 4

- a) The following table gives the frequency distribution of marks obtained by 28 students in a particular test.

Marks	30	31	32	33
Frequency	5	7	10	6

- i) Construct a cumulative frequency table for the given data. (4 marks)
- ii) Plot the cumulative frequency polygon showing marks obtained by the students. (4 marks)
- iii) Calculate the standard deviation. (8 marks)
- b) Explain any two data collection methods. (4 marks)

QUESTION 5

- a) The lifetime of a certain brand of heat pump, is known to be normally distributed with a standard deviation of 2. A sample of 6 heat pumps yielded the following observations.

2,0; 1,3; 6,0; 1,9; 5,1; 4

At $\alpha = 0,05$ is there reason to believe that the mean life of the heat pumps is greater than 2? (15 marks)

- b) Find a 95% confidence interval for the population mean. (5 marks)

