



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF MATHEMATICS AND ACTUARIAL SCIENCE
UNIVERSITY EXAMINATION FOR DEGREE OF B.sc. (CUMMUNITY HEALTH AND
PUBLIC HEALTH)

1ST YEAR SEMESTER ONE 2018/2019 ACADEMIC YEAR

KISUMU LEARNING CENTRE

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|---------------------|----------|----------------------|-------------------------------------|
| COURSE CODE | : | SMA 2111 | |
| COURSE TITLE | : | MATHEMATICS I | |
| EXAM VENUE | : | | |
| STREAM PH/CH | : | | |
| DATE | : | 14/08/19 | |
| TIME | : | 1 ½HRS | EXAM SESSION: 9.00 – 10.30AM |

Instructions

- 1. Answer question 1 (compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A: ANSWER ALL THE QUESTION ONE COMPULSORY (30 MARKS)

- a) Let f_1 , and f_2 be functions from \mathbb{R} to \mathbb{R} such that $f_1(x) = x^2 + 5x + 7$
And $f_2(x) = (x-2)$, what are the functions
Find the unknown in the equation below,
- i) f_1, f_2 (3mks)
 - ii) $f_2, -f_1$ (2mks)
 - iii) $f_1 + f_2$ (2mks)
- b) Simplify by rationalizing the denominator $\frac{8}{\sqrt{5} + \sqrt{2}}$ (5mks)
- c) Use the quadratic formula to solve
 $2x^2 - 5x - 3 = 0$ (5mks)
- d) Expand and simplify $(1+x)^6$ (5 mks)
- e) Solve the equation
 $3^{4x} \div 3^{-7} = 3^{15}$ (5mks)
- f) The mean of the numbers 3,4,a,5,7,a,5,8,5 and 9 is equal to the mode. Find the value of a and hence the median of the data (3mks)

SECTION B: ANSWER ANY TWO QUESTION FROM THIS SECTION (40 MARKS)

QUESTION TWO (20 MARKS)

Let $U = \{1,2,3,4,5,6,7,8,9\}$

- a) A = $\{2,3,4,5,6,7,8\}$
B = $\{3, 4, \dots, 8\}$
C = $\{1,2,3,4\}$ and
D = $\{4, 6, 7, 9\}$

- Find (i) $(A \cap B) \cap (C \cap D)$ (3mks)
ii) $(A \cup B) \cap (C \cap D)$ (4mks)
iii) $(B \cap D)^c$ (4mks)
- b) Draw a standard venn diagram to show the region corresponding to the given expression
 $(A \cap C^c) \cup B^c$ (6mks)
- c) What is the power set of $\{0, 1, 2\}$ (3mks)

QUESTION 3 (20 MARKS)

- a) A customer deposited Shs. 14,000 in a savings account. Use step by step method, to find the accumulated amount after one year if interest was paid at 12% p.a. compounded quarterly (8mks)
- b) Juma invested a certain amount of money in a bank which paid 12% p.a. simple interest. After 5 years his total savings were Shs. 5,600, determine the amount of money he invested (8mks)
- c) Statistics from a town in Kenya indicate that 160,000 people are HIV positive. It has also been established that the rate of its spread in this town is 8% p.a. How many people will be carriers in 6 years time?

QUESTION 4 (20 MARKS)

Evaluate

- a) $P(7, 3)$ (3mks)
- b) $C(15, 7)$ (3mks)
- c) In how many ways can a committee consisting of 2 faculty members and 3 students be formed if 6 faculty members and 12 students are eligible to serve in the committee (6mks)
- d) Solve triangle PQR in which
 $P=10.4\text{cm}$ $Q = 25.6\text{cm}$ and $\angle R=88^\circ$ (8mks)

QUESTION 5 (20 MARKS)

The examination marks in a mathematics test for 20 first year diploma students were as follows;

| | | | | |
|----|----|----|----|----|
| 43 | 38 | 39 | 37 | 33 |
| 31 | 28 | 35 | 27 | 32 |
| 29 | 30 | 34 | 44 | 24 |
| 32 | 34 | 41 | 36 | 38 |

Using class interval of 3, that is 28-30, 33

Make a frequency distribution table and from it

- a) Determine the modal class
- b) Estimate
- i) The mean
- ii) The median (12mks)
- c) Draw a bar graph to represent the information (8mks)