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(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST) UNIVERSITY MAIN EXAMINATION 2023/2024 ACADEMIC YEAR MAIN CAMPUS

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE IN DISASTER MITIGATION AND SUSTAINABLE DEVELOPMENT

COURSE CODE: DSM 111

COURSE TITLE: QUANTITATIVE TECHNIQUES IN DISASTER MANAGEMENT

DATE: 19/12/2023 **TIME: 12-2 P.M**

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer ANY OTHER TWO (2) questions

QUESTION ONE (COMPULSORY) (30 marks)

a) Distinguish between the following;

i. Union and intersection of two sets A and B as used in sets theory (2 marks)

ii. Measures of central tendency and measures of dispersion (2 marks)

b) Let A= 4, 5, 8, 6,10, 9, 12 and B= 5, 6, 13,15,16, Find

i. A u B (2 marks)

ii. A n B (2 marks)

c) There are 60 undergraduate students in DMSD class. Given that 10 of them drink alcohol but do not smoke, and 5 of them smoke but do not drink alcohol, how many smoke and drink alcohol? (4 marks)

d) 100 students were asked what their favorite sport was; 6 students liked all three sports, 24 students liked Hockey and Tennis, 29 students liked Football and Hockey, 20 students liked Football and Tennis, 59 students like Hockey, 17 students like only Football and 4 students had no preference. Using a Venn diagram, represent this information (4 marks).

e) The data below show marks obtained by DMSD students in an examination

40	46	51	41	33	65	48	43	36	71	74	39	56
50 58	40	37	68	37	25	54	55	55	49	38	44	59 73 44
50	47	56	61	41	40	42	58	66	38	39		

a) Construct a frequency distribution table with interval 25-34, 35-44. (3 Marks)

b) Estimate the mean, mode and median mark and comment (7 marks)

c) Estimate the standard deviation of the marks (4 marks)

QUESTION TWO (15 marks)

a) Outline how to present disaster data (2 marks)

b) State any four components of time series (4 marks)

c) Food production in Kakamega County was recorded as shown in the table below.

year	2009	2010	2011	2012	2013	2014	2015	2016	2017
Production (tons)	45	46	52	49	50	62.5	62	59	60

i. Calculate moving averages of order 5 (5 marks)

ii. Use the information in (c) above to draw a trend curve (4 marks)

QUESTION THREE (15 marks)

A survey of 100 randomly selected students gave the following information: 45 take mathematics, 41 take English, 40 take history, 15 take mathematics and English, 18 take mathematics and history, 17 take English and history while 7 take all the three subjects. Using this information,

i. Draw a Venn diagram (3 marks)

ii. Determine the number of students who;

a) Take none of the subjects (2 marks)

b) Take only one of the subjects (2 marks)

c) Take English but not mathematics (2 marks)

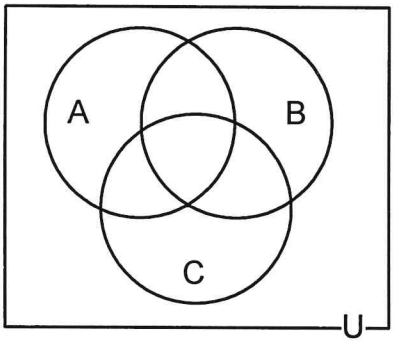
d) Do not take history and English (2 marks)

e) Neither take mathematics nor English (2 marks)

f) Do not take history (2 marks)

QUESTION FOUR (15 marks)

a) On a standard three-circle Venn diagram like the one shown below, shade the region(s) corresponding to the given set expression.



i. A n B (1 mark)
ii. A n C (1 mark)
iii. (A′ ∩ B) ∩ C′ (1 mark)
iv. A ∩ (B ∩ C′) (1 mark)
v. (A ∪ B) ∩ C (1 mark)
vi. (A ∩ C′) ∪ B′ (1 mark)
vii. (A′ ∪ B)′ ∩ C (1 mark)
viii. A′ ∪ (B′ ∩ C) (1 mark)

b) Consider the sets below and solve the following;

U = {b, c, d, e, f, g, h, i, j, k} S = {b, c, d, h, i, k} T = {b, d, e, f, h} V = {b, d, e, f, g, i}

Find:

i. S′ (1 mark)
ii. T′ (1 mark)
iii. V′ (1 mark)
iv. S∩T (1 mark)
v. S∪T (1 mark)
vi. S∩V (1 mark)
vii. S∪V (1 mark)