



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 108: INTRODUCTION TO LOGIC

DATE: 24/9/2019

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answers question one and any other two questions in this examination paper.

QUESTION ONE (COMPULSORY) (30 MARKS)

a) *Explain the following in logic*

- i. An argument (2 marks)
- ii. A Premise (2 marks)
- iii. Inference (2 marks)

b) Determine the type of relation that exists between the following sets of propositions P and Q. (10 marks)

- 1. Let P be “Today is not Friday” and let Q be “Today is Monday”
- 2. Let P be “Jane is not 31” and let Q be “Jane is 31”
- 3. Let P be “Today is Monday” let Q be “Today is Thursday”
- 4. Let P be “Jane is not 33” and let Q be “Jane is not 23”
- 5. Let Q be “Today is not Monday” and let P be “Today is Friday”

c) *Name and explain the fallacy committed in the following statements* (14 marks)

- i) You ought to try to study harder in school this year, Samuel, because it will spare your parents the embarrassment of a letter from the instructor telling them you're not taking your school work seriously.
- ii) You will back up my story and tell the committee I am reasoning logically; because if you don't I will do everything in my power to see that you are fired.
- iii) As I walked to the library from the social Center not one person spoke to me. Machakos University is not as friendly as I was led to believe.
- iv) Officer, please excuse my going over the speed limit, but my mother is ill and I'm being audited by the KBS, and I don't know how I can meet all my bills.
- v) Everyone says that a logic course is easier than a math course, so it must be.

- vi) According to the law, a man is innocent until proved guilty. So Mrs. Rachael must be innocent of the charge of bribery, since he has not yet been proved guilty. Therefore, since Mr. Rachael is innocent, it would be wrong to convict her.
- vii) I ought always to do what is right. I have a right to say what I think. Therefore, I ought always to say what I think.

QUESTION TWO (20 MARKS)

- a) Explain The Meaning Of Categorical Syllogism (3 marks)
- b) Highlight The Components Of Categorical Propositions (3 marks)
- c) State A Step-By-Step Guide Process For Testing Arguments For Validity With Venn Diagrams: (6 marks)
- d) Explain the components of categorical propositions (8 marks)

QUESTION THREE (20 MARKS)

- a) Establish the following claims by means of proofs in the system of Natural Deduction (8 marks)
 - (i) $P \rightarrow (Q_1 \vee Q_2), \neg Q_1 \wedge \neg Q_2 \vdash \neg P$
- b) Show that the following argument can be transformed into a propositionally valid argument if the premises are appropriately reformulated and if premises are added on which one may naturally rely. You may use the truth table method or give a proof in Natural Deduction.

If Brown sold his old Ford, he must have used the money for a trip to the Caribbean and he must be there now. Otherwise he could only have ordered a trip to Barcelona and he must be there by now. Nobody else would buy the beaten-up banger from Brown; only Jones could have bought that old Ford. So either Jones bought Brown's Ford or Brown is in Barcelona but it can't be the case that both are true, that is, that Jones bought the Ford and Brown is in Barcelona. (12 marks)

QUESTION FOUR (20 MARKS)

- a) In the following categorical propositions identify the quantifier, subject term, copula, and predicate term. (10 marks)
 - i) Some executive pay packages are insults to ordinary workers.
 - ii) No stressful jobs are occupations conducive to a healthy lifestyle.
 - iii) All oil-based paints are products that contribute to photochemical smog.
 - iv) Some preachers who are intolerant of others' beliefs are not television evangelists.
 - v) Some artificial hearts are mechanisms that are prone to failure.

- b) Determine whether the fallacies committed by the following arguments are formal fallacies or informal fallacies. (10 marks)
- i) If Francis was really mad, then he deceived Mutua. Francis was not really mad. Therefore, he did not deceive Mutua.
 - ii) Everything that runs has feet. The Tana River runs very swiftly. Therefore, the Tana River has feet.
 - iii) All persons who believe we create our own reality are persons who lack social responsibility. All persons governed by selfish motives are persons who lack social responsibility. Therefore, all persons who believe we create our own reality are persons governed by selfish motives.
 - iv) The ship of state is like a ship at sea. No sailor is ever allowed to protest orders from the captain. For the same reason, no citizen should ever be allowed to protest presidential policies.
 - v) Renowned Sonko Zukerman has said, “when it comes to vodka, Smirnoff plays second fiddle to none. ”We must therefore conclude that Smirnoff is the best vodka available.

QUESTION FIVE (20 MARKS)

- a) Draw Venn diagrams for the following propositions. (12 marks)
- i) No life decisions are happenings based solely on logic.
 - ii) All electric motors are machines that depend on magnetism.
 - iii) Some political campaigns are mere attempts to discredit opponents.
 - iv) Some rock music lovers are not fans of Madonna.
- b) In the following statements, First, identify the quantity, quality, and letter name. Next, state whether the subject and predicate terms are distributed or undistributed. (8 marks)
- i) “All people that drink and drive are irresponsible people.”
 - ii) “Some roses are not red flowers.”
 - iii) “Some artificial medical devices are mechanisms that are prone to failure.”
 - iv) “No ostriches are birds that can fly.”