



Machakos University

ISO 9001:2008 Certified

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

Supplementary

SCO 106

ELECTRONICS

Date: /08/2018

Time: 2 HOURS

Instruction

Answer question **ONE** and Any other **Two** among the four selective questions

Question one (Compulsory)

- (a) Differentiate between digital and analogue signals (4 Marks)
- (b) Explain any three applications of diodes (6 Marks)
- (c) Using block diagrams and truth tables differentiate multiplexer and encoder (10 Marks)
- (d) Describe the operation of JK flip-flop (8 Marks)
- (e) Define a register (2 Marks)

Question two

- a) Discuss the Operation of a Binary counter (6 Marks)
- b) Discuss any PN junction (6 Marks)
- c) Perform $5_{10} - (+A_{16})$ using a full adder (8 Marks)

Question three

- a) Using relevant diagrams, explain three types of flip-flop triggering (6 Marks)
- b) Discuss the operation of a D latch (8 Marks)
- c) Explain any three laws of boolean algebra (6 Marks)

Question four:

- a) Two batteries each with an emf (voltage) of 1.5V are connected in parallel. Two resistors with resistance **R₁= 4 ohms** and **R₂= 2 ohms** are then connected in the circuit. Find the current

through the circuit and voltage drop across each resistor and power across each resistor when

(9 Marks)

- (i) Resistors are connected in series
- (ii) Resistors are connected in parallel
- b) Describe the use of capacitors in computer memories **(6 Marks)**
- c) Discuss logical hazards **(5 Marks)**

Question five:

- a) Minimize the function and realize it using minimum number of gates.
 $F = \sum m(0, 3, 5, 6, 9, 10, 12, 15)$ **(8 Marks)**
- b) Explain the following gates using their truth tables and boolean expressions **(6 Marks)**
 - (i) AND
 - (ii) EX-OR
- c) Explain the significance of Transistors in computers **(6 Marks)**