



# MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR THIRD SEMESTER EXAMINATION FOR

CERTIFICATE IN INFORMATION TECHNOLOGY

BASIC ELECTRONICS

DATE: 15/12/2020

TIME: 2:30 – 5:30 PM

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## INSTRUCTIONS TO CANDIDATES

**Answer All Questions**

1. a) Write the values of the following resistors
  - i) Red, blue, violet, Gold (2 marks)
  - ii) Grey, brown, Yellow, no colour (2 marks)write the colour code for following resistors
  - i)  $2.2 \times 10^5 + 5\%$  (2marks)
  - ii)  $5.7 \times 10^3 + 20\%$  (2 marks)
  - iii)  $6.0 \times 10^8 + 10\%$  (2 marks)
- b) i) A Resistive load of  $10 \text{ k}\Omega$  was connected to 12 volt of power, how much current is flowing in the circuit and how much power will be dissipated at the load. (6 marks)  
ii) Calculate the total resistance in the parallel circuit below. (4 marks)
3. a) Convert the following binary numbers i) 11001.11 , ii) 11100 iii) 11111.101 iv) 10001 to (5 marks)  
b) Convert the following decimal numbers i) 45, ii) 273, iii) 946, iv) 380 to binary (5 marks)  
c) Convert the following hexadecimal numbers i) BF2 ,ii) 4D7E iii) 3BB1 iv) 96DA to binary (5 marks)

- d) Convert the binary number  
 i) 11011100,  
 ii) 11100011 to hexadecimal (5 marks)
4. a) Convert the following decimal numbers i) 20, ii) 345 ,iii) 654, iv) 1000 to octal (5 marks)
- b) Convert the following octal numbers i) 367 ii) 342 iii) 471 iv) 23 to hexadecimal (5 marks)
- c) Convert i) (1001)<sub>BCD</sub> ii) (100100)<sub>BCD</sub> to Excess 3. (5 marks)
- d) Convert the following numbers in binary i) 111100 ii) 1101100 to BCD (5 marks)
5. a) Perform the following functions  
 i) 1111001+110001  
 ii) 111x101 (5 marks)
- b) Using two's complement perform the following  
 i) 1010-1100  
 ii) 1100-1110 (5 marks)
- c) Draw the logic circuit and the truth table for the three input logic circuit.  
 i)  $F = \overline{A}\overline{B}CD + \overline{A}B\overline{C}D + ABCD$   
 ii)  $F = AB + \overline{A}\overline{B}CD + AB\overline{C}\overline{D}$  (6 marks)
- d) Describe two key global effects due to the emerging trends in information technology (4 marks)