



MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

CERTIFICATE IN INFORMATION TECHNOLOGY

1920/103: ELECTRONICS

DATE: 17/4/2019

TIME: 8.30-11.30 AM

INSTRUCTIONS:

ANSWER ALL QUESTIONS

QUESTION ONE

- a) Find state of transistor and its currents/voltages.
(Si BJT, with $\beta = 100$, $\beta_{\min} = 50$). (10 marks)
PNP Transistor (FIG 1)
- b) Compute transistor parameters (Si BJT with $\beta = 100$).
i) EC C ii) EB B (FIG 2) (10 marks)

QUESTION TWO

- a) Compute transistor parameters (Si BJT with $\beta = 100$).
C CE E
B BE E (FIG 3) (10 marks)
- b) Compute transistor parameters (Si BJT with $\beta = 100$).
C CE E
B BE E (FIG 4) (10 marks)

QUESTION THREE

- a) Convert the following binary numbers i) 11001.11 , ii) 11100 iii) 11111.101 iv) 10001 to decimal. (10 marks)
- b) Convert the following decimal numbers i) 45, ii) 273, iii) 946, iv) 380 to binary
- c) Convert the following hexadecimal numbers i) BF2 ,ii) 4D7E iii) 3BB1 iv) 96DA to binary
- d) binary
- e) Convert the binary number
 - i. 11011100,
 - ii. 11100011 to hexadecimal (10 marks)

QUESTION FOUR

- a) Convert the following decimal numbers i) 20, ii) 345 ,iii) 654, iv) 1000 to octal
- b) Convert the following octal numbers i) 367 ii) 342 iii) 471 iv) 23 to hexadecimal
- c) Convert i) $(1001)_{BCD}$ ii) $(100100)_{BCD}$ to Excess-3.
- d) Convert the following numbers in binary i) 111100 ii) 1101100 to BCD (20 marks)

QUESTION FIVE

- a) Perform the following functions
 - i. $1111001 + 110001$
 - ii. $111 * 101$ (10 marks)
- b) Using two's complement perform the following
 - i. $1010 - 1100$
 - ii. $1100 - 1110$ (10 marks)