KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER
MAIN EXAMINATIONS

FOR THE DEGREE OF B.SC (RENEWABLE ENERGY AND BIOFUELS TECHNOLOGY)

COURSE CODE: REN 213

COURSE TITLE: BASIC ELECTRONICS TECHNOLOGY

DATE: 21/06/2021 **TIME:** 2-4PM

INSTRUCTIONS TO CANDIDATES

TIME: 2 Hours

Answer question ONE and any TWO of the remaining

Question One (Compulsory)

a) Name four types of diodes. (2 marks)

b) Define the term rectification. (2 marks)

c) List three main properties of an op amp. (3 marks)

d) Define the cut-off frequency for a filter. (2 marks)

e) Differentiate between a band-pass filter and band-stop filter. (4 marks)

f) Determine the decimal equivalent of 11001_2. (3 marks)

g) State four types of logic gates. (4 marks)

h) State DE Morgan's theorem. (4 marks)

i) Define the term 'flip flop' (2 marks)

j) Define the following terms as applied in computer systems: (4 marks)

i. Microprocessor

ii. Software

Question Two

a) With the aid of diagrams explain the formation of N and P type semiconductors.

(10 marks)

b) State four types of logic families. (4 marks)

c) Figure 1 below shows a three input OR gate. Draw its truth table. (6 marks)

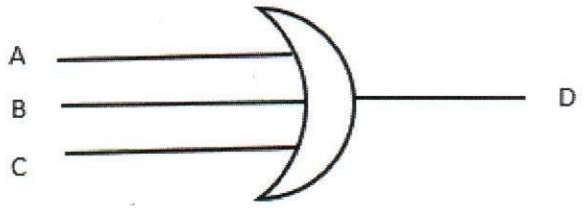

Figure 1

Question Three

a) For the summing op-amp shown in figure 2, determine the output voltage, V_0.

(10 marks)

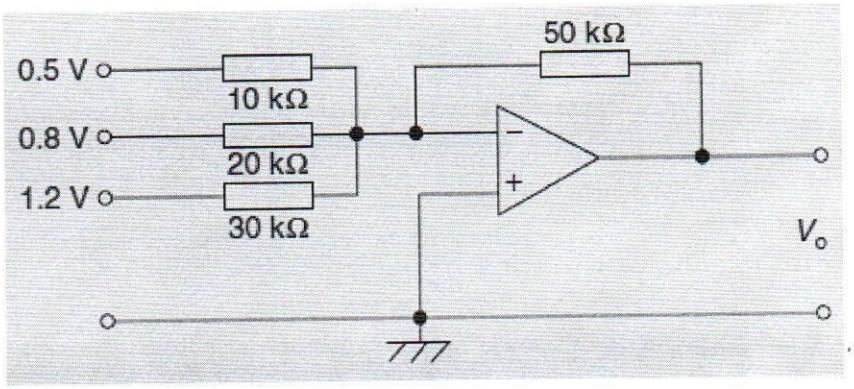

Figure 2

b) With aid of a diagram, describe the operation of a NPN bipolar junction transistor.

(10 marks)

Question Four

a) Draw a labelled diagram of the general microprocessor architecture of an intel 8085.

(20 marks)

Question Five

a) Highlight five applications of logic gates. (5 marks)

b) Differentiate between a combinational logic circuit and a sequential logic circuit.

(4 marks)

c) Determine the cut-off frequency and the nominal impedance for the low-pass T-connected section shown in figure 3. (11 marks)

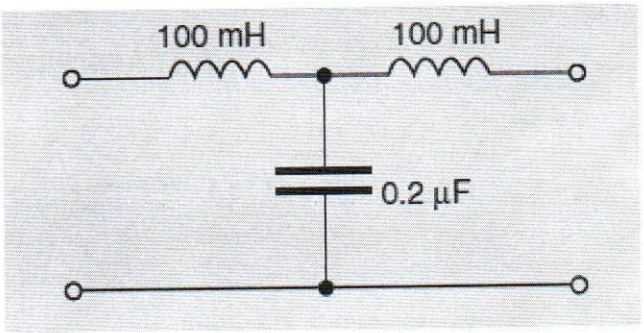

Figure 3