(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

SPECIAL /SUPPLEMENTARY EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE : CSC 450

COURSE TITLE : MICROPROCESSOR SYSTEMS DESIGN

DATE: 29 /01/2021 **TIME:** 8.00 A.M - 10.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

## QUESTION ONE [COMPULSORY] [30 MARKS]

a) Discuss the concept and benefits of memory interleaving   (4 marks)

b) Explain multitasking as a form of data processing and state its merit   (4 marks)

c) Outline three types of bus classification in computer systems interfacing   (6 marks)

d) Explain how the following challenges affecting efficiency of pipelining   (4 marks)

    i.   Branch prediction

    ii.   Memory latency

e) Describe the working principal of cache memory   (4 marks)

f) Highlight prominent features and applications of the SATA bus standards (5 marks)

g) Discuss the critic function of the Northbridge chip in a computer bus system. (3 marks)

QUESTION TWO [20 MARKS]

a) Discuss the superscalar microarchitecture design of a microprocessors chip. (8 marks)

b) Compare the microarchitecture designs listed below in terms of instruction flow and efficiency

    i.   Simultaneous Multithreading   (6 marks)

    ii.   Multicore designs

c) Highlight the application and the features of the HyperTransport system bus architecture

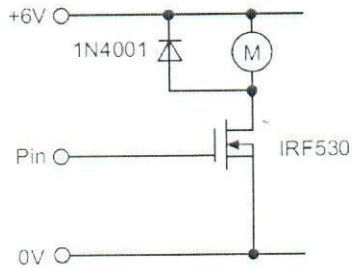   (6 marks)

QUESTION THREE [20 MARKS]

a) Highlight any two causes and two effects of memory errors   (8 marks)

b) Fig 1 below shows the RS-232 port. Write brief notes on the function and uses of RS-232 standard. State the functions of the signals marked Tx , DTR/DSR and Rx (6 marks)
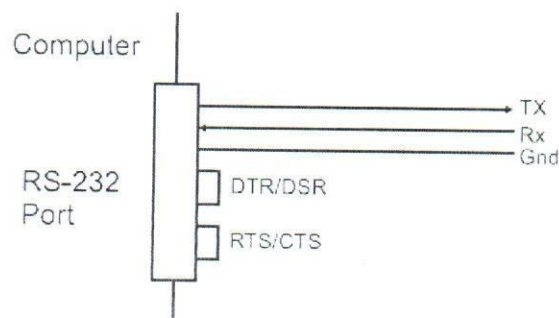
c) Describe the process details during the following phases of an instruction cycle:

    i)   fetch phase   (6 marks)

    ii)   decode phase

    iii) execute phase

QUESTION FOUR [20 MARKS]

a) Outline four application areas of microcontrollers (4 marks)

b) With an illustrative diagram, clearly show how an external 64K RAM can be interfaced with a microcontroller (10 marks)

c) Describe the working principle of the interfacing circuit below: (6 marks)

QUESTION FIVE [20 MARKS]

a) Discuss the salient features of the Ethernet bus standards (10 marks)

b) Identify the five roles of computer buses (5 marks)

c) Differentiate between asynchronous bus and synchronous bus and state one disadvantage of each bus. (5 marks)