

(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**SUPPLIMETARY EXAMINATIONS
YEAR THREE SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE**

COURSE CODE : CSC 351E

**COURSE TITLE : MICROPROCESSOR
SYSTEMS DESIGN**

DATE: 12/02/2021

TIME: 02.00 P.M – 04.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE [COMPULSORY] [30 MARKS]

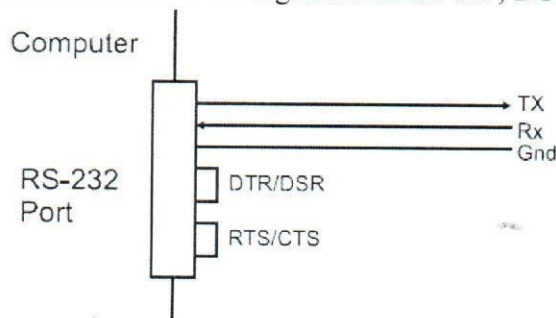
- a) Discuss the concept and benefits of memory interleaving (4 marks)
- b) Explain multitasking as a form of data processing and state its merit (4 marks)
- c) Outline three types of bus classification in computer systems interfacing (6 marks)
- d) Explain how the following challenges affecting efficiency 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]

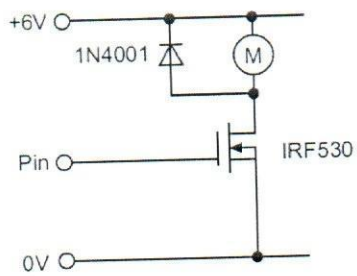
- a) Highlight any two causes and two effects of memory errors (8 marks)
- b) Fig 1 below shows the RS-232 port. Write brief notes on the function and uses of RS-232 standard. State the functions of the signals marked Tx , DTR/DSR and Rx (6 marks)



- 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)