FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGERIA
SCHOOL OF ELECTRICAL ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHATRONICS ENGINEERING
FIRST SEMESTER 2019/2020 B.Eng. DEGREE EXAMINATION
COURSE : MCE 534: Real-Time Systems

INSTRUCTION: Answer Atleast Two Questions From Each Section, All Questions Carry Equal Marks

TIME ALLOWED: 2 Hours

SECTION A

Question One

(a) Show how a user interacts with hardware (support your answer with diagram) **[4 Marks]**

(b) Explain the term "failed system" as it relates to real-time systems **[2 Marks]**

(c) Present a block diagram illustration for an n-input, m-output system **[2 Marks]**

(d) Expatiate on the acronym IDE, as it is utilized in real-time systems **[4 Marks]**

(e) Explain briefly, the associated terms; text editor, linker and compiler respectively **[3 Marks]**

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SECTION B

Question One

3a) Define the following Real time System (RTS) terminologies and give an example:

i. Timing constrains 1 Mark
ii. Relative deadline 1 Mark
iii. Absolute deadline 1 Mark
iv. Response time. 1 Mark

b) State three (3) classes of RTS and give atleast three (3) examples of each. **3 Marks**

c) Briefly explain two (2) primary techniques use in RTS design.

d) differentiate between a human brain and computer. **2 Marks**

2a) A single job has a release time of 3msec, absolute deadline of 10msec and its completes its execution at 9msec. what is the relative deadline and its response time of the job. **5 Marks**

b) state the most intelligent computer ?

c) What do you understand by the term computer architecture ?.

d) Draw the Gantt chart illustrating the execution of these processes with rate monotonic Algorithms.

Processes	Burst time	Arrival time	Period
P1	2	0	10
P2	1	0	5
P3	5	0	30
P4	2	0	15

3a)

Draw a Gantt chart illustrating the execution of a CPU tasks using Earlest Deadline First (EDF). Also compute the CPU utilization by each task. **5 Marks**

Task	Capacity	Deadline	Period
T1	3	8	5
T2	3	2	15
T3	2	4	10