	Uffech
Name:	(8)
Roll No.:	A Great of Sandalog and Salam
Invigilator's Signature:	

EMBEDDED SYSTEM

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

- 1. Choose the correct alternatives for any ten of the following : $10 \times 1 = 10$
 - i) I ²C bus stands for
 - a) intra IC connects bus
 - b) interface IC connects bus
 - c) inter IC connects bus
 - d) none of these.
 - ii) The number of bits of microcontroller in sophisticated embedded system is
 - a) 8 or 16
- b) 16 or 32
- c) 32 or 64
- d) none of these.

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- a) Von Neumann
- b) Harvard architecture
- c) SIMD
- d) all of these.

iv) UART stands for

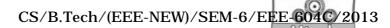
- a) Uniform Access for Receive & Transmitter
- b) Universal Access for Receive & Transmitter
- c) Universal Asynchronous Receiver Transmitter
- d) none of these.

v) USB stands for

- a) Universal serial bus
- b) Uniform serial bus
- c) Universal service bus
- d) none of these.

- vi) In Harvard architecture
 - a) separate address and data buses are used to access program and data memory
 - same address and data buses are used to access
 program and data memory
 - c) separate address bus but same data buses are used to access program
 - d) same address bus but separate data buses are used to access program and data memory.
- vii) Sequential execution of program statement pre-stored in memory is the fundamental principle of
 - a) Von Neumann computing
 - b) dataflow computing
 - c) pipelining
 - d) embedded processors.

viii)	Max	imum efficiency of p	ipelin	ed computing can be	
	obta	ined when the pipe is		A Parago (Y Exercising 2nd Explorer	
	a)	full			
	b)	empty			
	c)	partially full			
	d)	full in an interleaved i	nann	er.	
ix)	A m	assage queue is a			
	a)	PIC	b)	IPC	
	c)	IPS	d)	None of these.	
x)	Shared data problem can be removed using				
	a)	Semaphore	b)	Scheduler	
	c)	Sematophore	d)	None of these.	
xi)	Max	imum efficiency of p	ipelin	ed computing can be	
	obtained when the pipe is				
	a)	full			
	b)	empty			
	c)	partially full			
	d)	full in an interleaved i	nann	er.	
xii)	Eacl	h task has a/an			
	a)	ID	b)	Name	
	c)	Pointer	d)	None of these.	
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GROUP - B

(Short Answer Type Questions)

Answer any three of the following.



- 2. a) Define an embedded system.
 - b) How does DSP differ from General Purpose Processor (GPP)? 2 + 3
- 3. Explain the need of timer and watchdog times. $2\frac{1}{2} + 2\frac{1}{2}$
- 4. What do you means by task? State and explain task states.

2 + 3

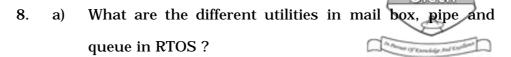
- 5. What is the difference between Neumann architecture and Harvard architecture?
- 6. Describe the design processor (GPP) methodology of an embedded system.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- 7. a) Define a system. What is an embedded system?
 - b) Describe the different components of an embedded system.
 - c) What are the components of embedded system hardware?
 - d) Describe the different types of embedded system processor chip or core. 3 + 4 + 3 + 5

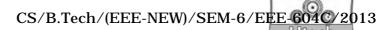


- b) What are the different memory management techniques adopted and why in real time OS?
- c) What are the different interrupt rules in real time system? 5+5+5
- 9. a) Compare CISC and RISC.
 - b) What do you mean by pipeline processing?
 - c) Is the SPI a synchronous or asynchronous bus ? Explain in brief SPI bus. 5+5+5
- 10. a) What do you mean by Task and Data?
 - b) Explain the term context and context switch.
 - c) What is the function of the Task Control Block?

5 + 5 + 5

- 11. a) What do you mean by the term 'semaphore'?
 - b) Explain Binary Semaphore and Counting Semaphore.
 - c) What is the difference between Binary Semaphore and Mutex? 2 + 8 + 5

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12. Write short notes on any *three* of the following .

- a) UART
- b) Compiler and cross compiler
- c) Cross Assembler
- d) 12C Bus
- e) Round Robin Scheduling.

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