(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 110851 **Roll No.** | | | | | | | | | | |

B.Tech.

(SEM. VIII) THEORY EXAMINATION 2013-14

REAL TIME SYSTEM

Time : 3 Hours *Total Marks : 100*

Note :– Attempt **all** questions. Each question carries equal marks

1. Attempt any **four** parts of the following : **(5×4=20)**

   (a) With suitable examples explain the difference between Soft and Hard Real Time Systems.

   (b) State and explain the issues involved in real time computing.

   (c) Compare and contrast critical and non-critical tasks.

   (d) How do Pipelining and Interrupts affect execution time estimation ?

   (e) Explain the issues involved in designing caches for Real Time Systems.

   (f) Define and explain performability.

2. Attempt any **four** parts of the following : **(5×4=20)**

   (a) What do you mean by timing constraints ? What are durational timing constraints ? What are minimum and maximum timing constraints and how are they different from durational constraints ?

   (b) What are the Real Time Operating Systems ? What are issues in design of Real Time Operating Systems ?

(c) State the characteristics of a Good Real Time OS.

(d) Define task and explain different types of task classes. State the issues involved in the allocation/scheduling problem.

(e) Give the main features of HART OS and features of VRTX.

(f) Compare and Contrast the functions of Commercial and Real Time Operating Systems.

3. Attempt any **two** parts of the following : **(10×2=20)**

(a) What do you mean by static scheduling and dynamic scheduling ? Explain with examples. Give the advantages and disadvantages of static and dynamic scheduling. List different types of multiprocessor and uniprocessor scheduling algorithms.

(b) Why is VRTX (Virtual Real Time Executive) known as Real Time Operating System ? Explain the general architecture of VRTX. How is intertask communication done in VRTX ?

(c) Define IRIS tasks. Give a scheduling algorithm for tasks with identical linear reward functions.

4. Attempt any **two** parts of the following : **(10×2=20)**

(a) What are the protocols used for Real Time Communication ? Explain the contention based protocol and Virtual Time Carrier Sensed Multiple Access protocol (VTCSMA protocol).

(b) What do you mean by soft and hard RT communication system ? Describe in detail.

(c) What are the issues in design of medium access control protocol ? Why are collision based protocol like CSMA/CD not suitable for real time communication ? What are access arbitration policy and capacity control policy for medium access control protocol ?

5. Attempt any **two** parts of the following : **(10×2=20)**

(a) What are Real Time Database Systems ? Draw the general model of Real Time Database System. What are Real Time Transactions ? Why is temporal correctness criterion adhered to determine correctness of a schedule ?

(b) Explain the concept of time redundancy. How is backward error recovery implemented ? Explain the concept of N-modular redundancy used for forward error recovery.

(c) What are the issues involved in RTS software development ? Explain in detail.