IT -831 B.E. VIII Semester Examination, June 2015

Real Time Systems (Elective-III)

Time: Three Hours http://www.rgpvonline.com Maximum Marks: 70

Note: Attempt all questions. Each question carry equal marks.

1. a) What are the performance measures for real time systems? Discuss the difference performance measures properties. 7

b) Explain the cost function and hard deadlines. 7

OR

2. a) Discuss the essential properties of the Real Time operating systems. 7

b) Explain an estimation of a source code analysis of a program. 7

3. a) Explain scheduling - rate monotonic scheduling algorithm. 7

b) Explain task assignment - utilization balancing algorithm.

OR

4. a) Show that Bin packing problem is a variation of the scheduling problem. 7

b) Name two simple heuristics for bin packing. If bins are of capacity 10 and 6 items have to be placed in bins, illustrate the solution with any heuristic. 7

5. a) Real - Time Linux more suitable to support real – time applications compared to the traditional Unix system? Justify. Explain your answer with respect to some of the important features required to support running real - time applications. Can Real - Time linux be used in embedded applications? 7

b) Explain the pros and cons of using an object - oriented language for real - time application development.

OR

6. a) Are supports for pointer data type and pointer arithmetic desirable for a programming language used in real - time application development? Explain your answer. 7

b) Explain interrupts and device handling with an example program.

7. Explain the term "delay jitter " in a real - time communication application? Identify at least two factors, which contribute to delay Jitter in real - time communications and explain how they cause jitter. 14

OR

8.a) What problems would you experience if you use a contention based protocol such as Ethernet for real time task communications? b) Describe a contention based real time communication protocol and explain how it overcomes the problem that Ethernet suffers from. 7

9. a) Explain how fault - tolerance can be achieved in real - time task communication? Explain a scheme to provide software fault- tolerance in a time safety critical application. Make suitable assumption.

b) Briefly explain how hardware faults e.g. processor failures can be tolerated in a Real - Time applications. 7

OR

10. a) In providing system - level fault - tolerance, why are hardware failures more predictable and easier to handle compared to software failures? 7

b) Explain the following:

i) Information Redundancy.

ii) Fault and error containment.