**Reg. No. :** | | | | | | | | | | |

**Question Paper Code: 22074**

M.E. DEGREE EXAMINATION, OCTOBER 2014.

Second Semester

VLSI Design

01PVL204 - REAL TIME EMBEDDED SYSTEMS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What are the typical non functional requirements of the Embedded system design process?
2. Give the relationships between objects and classes.
3. What is the use of Watch Dog timer in Embedded System?
4. Define register-indirect addressing mode used in an ARM Processor.
5. Give the Ethernet Packet Format.
6. When the CAN bus will be in recessive and dominant state?
7. What is clock-driven approach?
8. Give the difference between dynamic and static systems.
9. Describe the three different goals for a design process.
10. What is Hardware and Software Design?

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Explain the various challenges in Embedded Computing System Design? (8)

(ii) Explain in detail about Architectural design. (6)

Or

(b) With the basic requirements and specification, design a model train controller. (14)

12. (a) (i) Write the ARM instructions for the operation y=a*(b+c). (7)

(ii) Discuss about the bus configuration of PIC microcontroller. (7)

Or

(b) What are the development environments in a Embedded Computing Systems and discuss about various debugging techniques. (14)

13. (a) (i) Discuss in detail about $I^2C$ bus used in microcontroller based systems. (10)

(ii) Write about the fundamental protocol on the Internet with Packet structure. (4)

Or

(b) (i) Explain in detail about the procedure and steps involved in designing an elevator controller. (14)

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14. (a) (i) Explain about the weighted round-robin approach in order to schedule real time systems. (7)

(ii) Explain the effective release times and deadlines in real time system. (7)

Or

(b) (i) Write about Earliest Deadline First (EDF) algorithm to assign Priorities to various jobs. (7)

(ii) What are the different challenges in validating timing constraints in priority driven systems. (7)

15. (a) (i) Describe in detail about Telephone System Design. (10)

(ii) Write about Quality Assurance. (4)

Or

(b) Explain system architecture, hardware and software design of Ink Jet Printers. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) Design an alarm clock with required specifications. (10)

Or

(b) Discuss the design process of Personal Digital Assistants. (10)