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B.E. (Information Technology)

EMBEDDED SYSTEMS

(2008 Pattern) (Elective - II)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *In section I attempt : Q.No. 1 or Q.No. 2, Q.No. 3 or Q.No. 4, Q.No. 5 or Q.No. 6. In section II attempt : Q.No. 7 or Q.No. 8, Q.No. 9 or Q.No. 10, Q.No. 11 or Q.No. 12.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume Suitable data, if necessary.*

SECTION - I

Q1) a) What are the advantages of using ASIC & SOC in embedded systems? Explain. [8]

b) Classify embedded systems. Give examples for each category. [8]

OR

Q2) a) What are the characteristics of embedded systems? [6]

b) What are the features of ARM7? [6]

c) Differentiate between CISC and RISC. [4]

Q3) a) With the help of neat diagram, explain special structural units of processor to improve the performance in Embedded systems. [6]

b) Name the methods used for managing power & energy in an embedded system? [6]

c) Describe different types of memories those can be integrated in a processor? [6]

OR

P.T.O.

- Q4)** a) What is the difference between level 1 and level 2 cache? Which other techniques are used to improve memory performance? [6]
b) What is the importance of clocking unit in embedded systems? How does it affect performance of an embedded system? [6]
c) What is Watchdog timer? How is useful in an embedded system? [6]

- Q5)** a) What is RS-232C? Give details. [8]
b) Describe I²C protocol and the applications. [8]

OR

- Q6)** a) Which optical devices are used in the embedded systems? [4]
b) What is the topology used in USB protocol? [4]
c) How does host recognize the device insertion in USB protocol? [8]

SECTION - II

- Q7)** a) What are the different phases of software development cycle for a typical embedded system? [8]
b) What are queues in C language? What are their uses in embedded system programming? [6]
c) What are the advantages of using high level language instead of assembly language for embedded system programming? [4]

OR

- Q8)** a) When do you consider object oriented programming language for embedded systems? Explain. [6]
b) What is cross compiler? Give details. Give one example. [6]
c) How embedded system software can be debugged? Give one example for such a debugger. [6]

- Q9)** a) What are the different characteristics of real time operating system? Give two example of RTOS. [6]
b) With the help of neat diagram, explain cooperative round robin scheduling model for RTOS. What is interrupt latency time for this scheduling model. [10]

OR

- Q10)a)** With the help of neat diagram, explain cyclic scheduling with time slicing for RTOS. [8]
- b) Define and explain interrupt latency period. What is its significance in RTOS? [4]
- c) What is a Process and a Thread? [4]

- Q11)a)** Differentiate MicroC/OS-II and VxWorks based on features and their area of application. [6]
- b) With the help of neat system block diagram, explain the system requirements and tasks for chocolate vending machine. [10]

OR

- Q12)a)** How tasks are managed in MicroC/OS-II? Explain in detail. [8]
- b) With the help of neat diagram, explain synchronization of tasks and IPCs for smartcard application. [8]

