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B.E. (Elect. & Telecommunication / Elect. & Communication Engineering) Eighth Semester (C.B.S.)

# Elective-II : Embedded System

P. Pages : 2 **NRT/KS/19/3646**

Time : Three Hours * 0 7 9 9 * Max. Marks : 80

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Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Diagrams and chemical equations should be given whenever necessary.
11. Use of non programmable calculator is permitted.

**1.** a) What do you mean by embedded system? Explain various application areas of embedded system with examples. **7**

b) Explain various recent trends in embedded system design. **6**

**OR**

**2.** a) Define Design metrics. Explain following design metrics used in embedded system. **6**
i) NRE cost and unit cost.
ii) Performance and Maintainability.

b) What do you mean by Time to market design metric? Obtain an expression of percentage revenue loss due to delayed entry of product in market. **7**

**3.** a) Draw and explain software architecture of an embedded system. **7**

b) Write detailed note on: **6**
i) Device Drivers.
ii) Context Switching.

**OR**

**4.** a) Draw and explain hardware architecture of embedded system. **7**

b) Write short note on : **6**
i) Processor selection criteria in embedded system.
ii) Memory architecture band its types.

**5.** a) Draw and explain ARM core dataflow model in detail. **7**

b) Explain various processor mode supported by ARM processor. **7**

**OR**



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**6.** a) Explain exception handling process in ARM processor. Also give the vector address for each exception explain exception priorities in detail. **8**

b) Draw and explain complete register organization of ARM processor. Also explain CPSR register. **6**

**7.** a) Write short technical notes on **any two.** **13**

a) USB.

b) CAN protocol.

c) Bluetooth.

**OR**

**8.** Write short technical notes on : **any two.** **13**

a) GPRS protocol.

b) $I^2C$ protocol.

c) IEEE 802.11.

**9.** a) What is task in embedded system? What is task scheduling? How various issues in scheduling the task is handled. Also draw and explain Tasks state diagram. **8**

b) Write short notes on **6**
a) Mailbox
b) MuTEX
c) Pipes

**OR**

**10.** a) What is priority inversion problem? How it can be avoided. Explain with suitable example. **7**

b) Explain preemptive and non preemptive multitasking algorithm in detail. **7**

**11.** Discuss in detail the case study of automation field on Automatic Chocolate Vending Machine (ACVM) cover all the aspects of designing of ACVM like requirement, of system, its specification, hardware and software architecture, working, utility etc. **13**

**OR**

**12.** Discuss in details the case study of security field on Biometric machine cover all the aspect of designing of biometric machine like requirement of system, its specifications, hardware, software architecture, working, applications in other field, utility, etc. **13**

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