



**B.E DEGREE EXAMINATIONS: MAY 2018**

(Regulation 2015)

Sixth Semester

**ELECTRONICS AND INSTRUMENTATION ENGINEERING**

U15EITE02 : Embedded Systems

**COURSE OUTCOMES**

- CO1:** Acquire a basic knowledge about fundamentals of microcontrollers, programming and system control to perform a specific task.
- CO2:** Acquire knowledge about devices and buses used in embedded networking.
- CO3:** Develop programming skills in embedded systems for various applications.
- CO4:** Acquire knowledge about basic concepts of REAL Time Operating Systems.
- CO5:** Build complex embedded system with the use of RTOS.

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Assertion(A): CISC controllers are based on Von Neumann architecture. CO1 [K<sub>1</sub>]  
Reason(R): Embedded processors are based on Harvard architecture.
- a) Both A and R are True b) A is True but R is false  
c) A is true and R is correct explanation of A d) A is True but R is not the correct explanation of A
2. 8051 MCU is based on CO1 [K<sub>1</sub>]
- a) RISC and Harvard architecture b) CISC and Von Neumann architecture  
c) CISC and modified Harvard architecture d) CISC and Harvard architecture
3. The handshake signals corresponding to DTR and RTS are respectively, CO2 [K<sub>1</sub>]
- a) DTS, CTS b) DTS, CTR  
c) DSR, CTS d) DSR, RDY
4. Connection between 8255 in mode 2 and 8051 is an example of CO2 [K<sub>1</sub>]
- a) Half-duplex b) Full duplex  
c) Simplex d) Diplex
5. ALE signal is used in CO3 [K<sub>1</sub>]



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|-----|--|-----|-------------------|
| 18. | State priority inversion problem. How is it resolved?          | CO4 | [K <sub>1</sub> ] |
| 19. | Discuss smart card as an implementation of an embedded system. | CO5 | [K <sub>1</sub> ] |
| 20. | List the factors that determine the choice of RTOS.            | CO5 | [K <sub>1</sub> ] |

**Answer any FIVE Questions:-  
PART C (5 x 14 = 70 Marks)  
(Answer not more than 300 words)**

**Q.No. 21 is Compulsory**

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|-----|---|------|-----|-------------------|
| 21. | a) Sketch UART data transmission format.  | (4)  | CO1 | [K <sub>2</sub> ] |
|     | b) Illustrate communication between DTE and DCE employing RS232C protocol.<br>Discuss with appropriate block schematic. | (10) |     |                   |
| 22. | Elucidate the steps in embedded system design process. Also, highlight the challenges faced in design.                  |      | CO1 | [K <sub>2</sub> ] |
| 23. | Discuss and compare USB and i2c communication protocols.  |      | CO1 | [K <sub>2</sub> ] |
| 24. | Illustrate 8051 matrix Keypad and LCD interface.  |      | CO2 | [K <sub>2</sub> ] |
| 25. | Compare tasks, processes and threads. Also, illustrate how resource utilization is optimized in each.                   |      | CO3 | [K <sub>2</sub> ] |
| 26. | Discuss various task scheduling algorithms detail.  |      | CO5 | [K <sub>2</sub> ] |
| 27. | a) State specifications of ADC.   | (4)  | CO2 | [K <sub>2</sub> ] |
|     | b) Illustrate 8051 – ADC interface in detail.   | (10) |     |                   |

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