Paper / Subject Code: 32401 / Microcontroller and Embeded Systems

Time: 3 Hours **Marks: 80**

N.B. 1. Question No 1 is compulsory.

2. Solve any **three** questions out of remaining five questions.

3. Assume suitable data if necessary.

4. Figures to right indicate marks.

Q. 1. Solve any **four** out of five. (4*5=20)

a. Explain the significance of bits of CPSR of ARM7.

b. Discuss the major application areas of an Embedded System.

c. Draw the functional pin diagram of ADC 0808.

d. Differentiate between Real-Time Operating System and General Purpose Operating System.

e. Explain the instructions of 8051 microcontroller – MOVX, ADC, SJMP, ANL, JNB

Q. 2. a) Briefly explain about Inter Process Communication. (10)

b) Write assembly language program for 8051 to find number of positive and negative numbers from a given ten 8 bit numbers stored from 50H. Store result at 60H (no of positive numbers) and 61H(no of negative numbers). (10)

Q. 3. a) Draw and explain the functional block diagram of 8255 Programmable Peripheral Interface. (10)

b) Discuss the various operating modes of ARM7 processor. (10)

Q. 4. a) Compare the features of Arduino and Raspberry Pi embedded target boards. (10)

b) Explain the SFRs- TMOD, IE & SCON. (10)

Q. 5. a) Explain different addressing modes of single register load/store instruction of ARM7 processor. (10)

b) Demonstrate with example, the scheduling algorithms used in RTOS. (10)

Q. 6. a) What are sensors used in IoT applications with the target embedded boards for measuring temperature , pressure and humidity? Explain the same. (05)

b) Discuss the interrupt structure of 8051 microcontroller. (08)

c) Discuss various embedded microcontroller cores used in embedded System.- RICS,CISC,ARM and DSP (07)

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