22532

12223

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) List any four application's of Embedded system.

b) State any two characteristics of embedded systems.

c) List any four software development tools used in an embedded system.

d) Sketch and label the block diagram of embedded system.

e) State any four application's of bluetooth.

f) State the functions of following pins of LCD.

i) RS

ii) R/W

g) List any four function's of RTOS.

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Marks

2. Attempt any THREE of the following: **12**

a) Compare RISC and CISC processor's.

b) Write 89C51 C program to toggle all the bit's of P_0, P_1 and P_2 continuously with a zooms delay using the sfr keyword to declare the port address.

c) Compare between CAN and I^2C protocols on following points:

i) Data transfer rate

ii) Number of fields

iii) Addressing bit

iv) Application

d) Write 89C51 C program to rotate stepper motor by 90° Degree clockwise. Assume step angle is 1.8° degree and four step sequence.

3. Attempt any THREE of the following: **12**

a) If the content of ACC = 0 × 04 and P1 = 0 × F3. State the result after execution of the following statement independently.

i) Result = ACC and P_1

ii) Result = ACC | P_1

iii) Result = ACC $\wedge$ P_1

iv) Result = ~ P_1

b) Sketch and label the pinout of RS232 and describe the function of DCE and DTE pins.

c) Explain the concept of Deadlock with suitable schematic.

d) Compare general purpose operating system and RTOS (four points).

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Marks

4. Attempt any THREE of the following: 12

a) Write a 89C51 C program to generate continuous square wave of 2 KHz on P1.5 using mode 1 of timer 0. The XTAL frequency is 11.0592 MHz.

b) State any four features of Bluetooth Technology.

c) Compare features of PIC and ARM microcontrollers (four points).

d) Compare assembly language and embedded C program with respect to :–

i) Execution time

ii) Time for coding

iii) Hex file size

iv) Debugging

e) Draw an interfacing diagram of DAC to 89C51 and write a C language program to generate square wave using DAC.

5. Attempt any TWO of the following: 12

a) Write a 89C51 C program to display "WELCOME" on 16 × 2 LCD display.

b) Write a 89C51 C program to transfer the message "Exam" serially at baud rate 4800, 8 bit data, 1 stop bit.

c) Draw CAN message format and explain it. State any two application's of CAN BUS.

6. Attempt any TWO of the following: 12

a) Write a 89C51 C program for 4 × 4 keyboard matrix.

b) Draw the interfacing diagram of seven segment LED display to 89C51 and write a 89C51 C program to display 0.9 continuously.

c) List any four characteristics of RTOS and explain the following functions of RTOS in brief :

i) Scalability

ii) Task management

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