Scheme – E

Sample Question Paper

Course Name : Electronics Engineering Group

Course Code : EJ/EN/ET/ EX/ED/EI

Semester : Sixth

12269

Subject : Embedded Systems

Marks : 100 Marks **Time: 3 Hrs.**

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q.1 A) Attempt any THREE. **12Marks**

a) Write the steps executed by microcontroller on activation of interrupt.

b) State any four features of I2C and CAN Bus Protocol.

c) State the functions of :

i. Compiler

ii. Debugger

iii. simulator

iv. Emulator

d) Describe the need of RTOS in an Embedded System and state any two specifications of RTOS.

Q.1 B) Attempt any ONE. **06 Marks**

a) Explain the software used in Processor Specific assembly language and high level language.

b) State Scheduling algorithm of RTOS and describe concept of Round Robin Scheduling.

Q.2 Attempt any FOUR. **16 Marks**

a) Generate a square wave with an ON and OFF time of 3msec on all pins of port 1. Assume crystal frequency of 12 MHz. write a program in assembly language.

b) Describe Serial modes of 8051.

c) With suitable flowchart explain the steps involved in Embedded software development cycle.

d) Write an assembly language program to generate a 4 step sequence for a 4 phase stepper motor.

e) State the methods of Task Synchronization and describe any one in detail.

Q.3 Attempt any FOUR. **16 Marks**

a) State two external hardware interrupts in 8051 microcontroller. At what port pins are they located? State the role the two bits TCON.0 and TCON.2 play in execution of the external interrupts.

b) State any three features of Simulator and three features of IDE.

c) State any four features and applications of Embedded system.

d) Draw interfacing diagram of LCD display and explain the functions of:

i. RS

ii. EN

iii. R/W

e) Draw the circuit diagram to interface ADC to 8051.

Q.4 A) Attempt any THREE. **12 Marks**

a) With a suitable figure explain the I2C bus interface with two signals.

b) With suitable example explain the concept of device drivers.

c) Explain alternate pin functions of port 3.

d) Describe the format of SCON.

Q.4 B) Attempt any ONE. **06 Marks**

a. State any three features of Simulator and three features of IDE.

b. Draw the labeled diagram of interfacing of DAC with 8051 and write a program in assembly language to generate a triangular wave.

Q.5 Attempt any TWO. **16 Marks**

a) Interface 4 x 4 matrix keyboard with 8051 microcontroller ports. Draw Interfacing diagram and flowchart.

b) Write the steps to program timer in mode 2 and generate a program to generate a square wave of frequency 1 KHz on pin P1.2. Assume Crystal frequency of 22 MHz .

c) Draw interface diagram of LCD interfacing and write a program to send information “MSBTE” to LCD.

Q.6 Attempt any FOUR. **16 Marks**

a) Describe Timer modes of 8051.

b) Draw and explain architecture of ARM 7 processor.

c) What are different types of Advanced Serial High speed Bus.

d) Explain Interprocess Communication.

e) Draw the interfacing diagram for seven segment display.

f) Describe the concept of Starvation.