Scheme – I

Question Paper Profile

Program Name : **Electronics Engineering Programme Group**
Program Code : **DE/EJ/ET/EN/EX/EQ/IS/IC**
Semester : **Fifth**
Course Title : **Embedded System (Elective for IS/IC)**
Marks : **70** **Time: 3 Hrs.**

22532

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) Attempt any FIVE of the following: **10 Marks**

(a) Define the terms: RISC and CISC

(b) List any two applications of Harvard Architecture.

(c) State the protocol used for:
   i. Modems
   ii. Automation and Control

(d) Illustrate any two data types used in C with their ranges.

(e) Define the terms: Scalability, Predictability related to RTOS.

(f) Label the missing bits in the following TCON Register:

		TF0	TR0		IT1		IT0
bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0

(g) List the various temperature sensors used in industry.

Q.2) Attempt any THREE of the following: **12 Marks**

(a) Explain with block diagram the hardware components used in Embedded system.

(b) Write a C language program to toggle all bits of P0, P1, P2 and P3 continuously with certain delay.

(c) Draw the 9 pin RS 232C connector and state the significance of DTR and DSR signals.

(d) State any two applications for each of the following:
   i. Small Scale Embedded System.
   ii. Medium Scale Embedded System.

Q.3) Attempt any THREE of the following. 12 Marks

(a) Write a 'C' language program to rotate stepper motor by 90^0 clockwise. Assume step angle of 1.8^0 and 4 step sequence.

(b) Compare desktop OS and RTOS on following points
   i) Time behaviour
   ii) Context switching
   iii) Memory requirement
   iv) Kernel used

(c) Describe CAN bus with frame format.

(d) Write a C language program to transfer message "MSBTE" serially at 9600 baud rate. Assume crystal frequency of 12MHz.

Q.4) Attempt any THREE of the following. 12 Marks

(a) Describe how assembly language can be included in 89C51 C program. Give an example.

(b) Compare Zigbee and Bluetooth on the basis of following points:
   i. Modulation Technique.
   ii. Communication Range.
   iii. Power Consumption.
   iv. IEEE standard.

(c) Draw the interfacing diagram of ADC with 89C51 and explain the function of following pins: SOC, EOC and OE.

(d) Explain the frame format of I^2C with suitable diagram.

(e) Draw the interfacing diagram of 4x4 matrix keyboard with 89C51.

Q.5) Attempt any TWO of the following. 12 Marks

(a) Explain pre-emptive and round robin scheduling in RTOS.

(b) Draw the interfacing diagram of DAC to 89C51 and write a C language program to generate triangular waveform using DAC.

(c) Write a C language program to generate square waveform of 5KHz on pin P1.5 of 89C51.

Q.6) Attempt any TWO of the following. 12 Marks

a) Explain in detail the term deadlock and techniques to prevent it.

b) Explain in detail any six characteristics of Embedded System.

c) Draw the interfacing of key and LED to 89C51 to pins P1.0 and P2.0. Write a C language program to read the status of Key and Display on LED.
   [key open = LED OFF ; Key close = LED ON]

Scheme – I

Question Test Paper - I

Program Name : **Electronics Engineering Programme Group**

Program Code : **DE/EJ/ET/EN/EX/EQ/IS/IC**

22532

Semester : **Fifth**

Course Title : **Embedded System (Elective for IS/IC)**

Marks : **20** **Time: 1 Hour.**

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 Attempt any FOUR. **08 Marks**

(a) Define the terms: RISC and CISC

(b) Write two applications of ARM processor.

(c) List various data types in embedded C with their data range. (any two)

(d) List various standard baud rates for serial communication.

(e) State the protocol used for:

i) Modems

ii) Automation and Control

Q.2 Attempt any THREE. **12 Marks**

(a) Explain the frame format of I^2C with suitable diagram

(b) Write a C language program to generate square waveform of 5KHz on pin P1.5 of 89C51

(c) If the content of ACC = 0 × 02 and P1 = 0 × F3. State the result after execution of following statements independently:

i) result = ACC & P1

ii) result = ACC | P1

iii) result = ACC ^ P1

iv) result = ~ P1

(d) Compare between assembly language program with an embedded 'C' program with reference to following points:

i) Execution time

ii) Time for coding

iii) Hex file size

iv) Debugging

Scheme – I

Question Test Paper - II

Program Name : **Electronics Engineering Programme Group**
Program Code : **DE/EJ/ET/EN/EX/EQ/IS/IC**
Semester : **Fifth**
Course Title : **Embedded System (Elective for IS/IC)**
Marks : **20** **Time: 1 Hour.**

22532

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 Attempt any FOUR. **08 Marks**

(a) List the any two temperature sensors used in industry.
(b) Write specifications of ADC.
(c) State the methods of task synchronization
(d) Define Hard and Soft real time
(e) List any four functions of RTOS.

Q.2 Attempt any THREE. **12 Marks**

(a) Draw the interfacing diagram of DAC to 89C51 and write a C language program to generate triangular waveform.
(b) Compare desktop OS and RTOS [any 4 points]
(c) Explain the concept of starvation and deadlock in RTOS
(d) Write 'C' program to rotate the stepper motor by two complete rotations and then stop. Assume step angle as 1.8°.