

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

22532

Time: 3 Hrs.

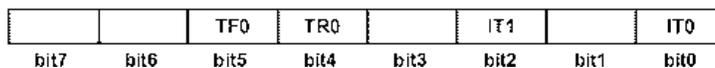
Instructions:

- (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) 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:



- (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° clockwise. Assume step angle of 1.8° 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 I²C 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
Semester : Fifth
Course Title : Embedded System (Elective for IS/IC)
Marks : 20

22532

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 I²C 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

22532

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) 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° .