S.Y. BSC-IT - SEM IV - Reg/ATKT Exam - April '18

Q. P. Code: 36153

25. 4. 18

(Time: 2½ hours)

Total Marks: 75

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Distinguish between general purpose system and embedded systems
b. List three applications of embedded systems. Discuss any one in detail.
c. Briefly explain function of the following. Also give on example each
   i) PLD
   ii) COTS
d. What is use of a stepper motor in an embedded system? Explain different types of stepper motors.
e. Discuss characteristics of embedded systems.
f. What are operational quality attributes of embedded system?

2. Attempt *any three* of the following: **15**

a. Explain the difference between domain specific and application specific embedded system. Give two examples of each.
b. What is role of display panel in a washing machine? What inputs can be accepted from user in a washing machine display interface?
c. What is memory map? Explain the interrupt map for embedded system
d. What are different types of memory? Explain each in brief.
e. Explain the function of control and status register. Give example.
f. Write a note on watchdog timer.

3. Attempt *any three* of the following: **15**

a. With neat block diagram explain the components of 8051 microcontroller.
b. Draw the pinout diagram and explain functions of pins of 8051 microcontroller.
c. What is the need of interfacing external memory with 8051 microcontroller? How is the interfacing done?
d. Write a note on data types in embedded C.
e. Explain how time delay is calculated using 8051 microcontroller? Write code segment to support your explanation.
f. Demonstrate the use of bitwise operator in embedded C.

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4. Attempt *any three* of the following: **15**

a. What are the factors to be considered in selecting a microcontroller for embedded system? Discuss any one in detail.
b. Explain the steps in designing an embedded system using 8051 microcontroller.
c. List and explain in brief the features of 8051 microcontroller.
d. With required example explain structure of embedded system program
e. Explain what is meant by the super loop based approach.
f. What are different types of files created in the process of burning a program onto IC.

5. Attempt *any three* of the following: **15**

a. Define operating system kernel. What are services provided by kernel?
b. Distinguish between Real Time operating system and general purpose operating system.
c. List and explain the functional requirements to be considered in order to select the correct RTOS.
d. What are the components of IDE of embedded system development environment?
e. Explain following terms –
   Compiler
   Debugger
   Disassembler
   Emulator
   Simulator
f. Write a note on current trends in embedded industry.

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