BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.RA-2022
Course Name – Embedded System
Course Code - ECPC501
(Semester V)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) A microcontroller at-least should consist of:

a) RAM, ROM, I/O devices, serial and parallel ports and timers
b) CPU, RAM, I/O devices, serial and parallel ports and timers
c) CPU, RAM, ROM, I/O devices, serial and parallel ports and timers
d) CPU, ROM, I/O devices and timers

(ii) Identify, how are microcontrollers classified on the basis of internal bus width?

a) 8,16,32,64 bits
b) 4,8,16,32 bits
c) 32,64 bits
d) 4,8,,32 bits

(iii) Give the names of the buses present in a controller for transferring data from one place to another?

a) a. data bus, address bus
b) b. data bus
c) c. data bus, address bus, control bus
d) d. address bus

(iv) Select why microcontrollers are not called general purpose devices?

a) a. because they are based on VLSI technology
b) b. because they are not meant to do a single work at a time
c) c. because they are cheap
d) d. because they consume low power

(v) Select how many types of architectures are available, for designing a device that is able to work on its own?

a) 1
b) 2
c) 3
d) 4

(vi) Choose 8085 microprocessor has how many pins:

a) 40
b) 42

c) 46 d) 49

(vii) Select 8051 has how many pins

a) 50 b) 60
c) 40 d) 80

(viii) Select which of the following possess the same set of instructions

a) 8088 and 80286 b) 8086 and 80286
c) 8051 and 8088 d) 8051 and 8086

(ix) Identify what is the purpose of the address bus:

a) to provide data to and from the chip b) to select a specified chip
c) to select a location within the memory chip d) to select a read/write cycle

(x) A dual independent bus has:

a) Enhanced system bandwidth b) CPU that can access both cache and memory simultaneously
c) High throughput d) All of the mentioned

(xi) Examine the pin of the Intel 8085 microprocessor, which is responsible for carrying the least significant bit (LSB) of the memory address during a memory read or write operation.

a) ALE (Address Latch Enable) b) AD0 (Address/Data Bit 0)
c) S1 (Status Bit 1) d) RD (Read)

(xii) Define process compatibility in embedded system design.

a) The ability to integrate hardware with software b) The ability to use the same manufacturing process across different ICs
c) The ability to reduce power consumption in embedded systems d) The ability to interface with external systems

(xiii) Produce a benefit of employing a common manufacturing process for multiple ICs in embedded systems.

a) Improved security b) Higher power consumption
c) Reduced cost d) Increased design flexibility

(xiv) How do you differentiate between the types of software responsible for controlling the operation of a specific device in an embedded system?

a) Device driver b) Operating system
c) Firmware d) Middleware

(xv) Discuss the software development process that involves iterative design and continuous testing and feedback.

a) Agile b) Waterfall
c) Spiral d) RAD

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Classify the different types of embedded memories. (3)
3. Record the common applications of digital signal processing in embedded systems and discuss their importance. (3)
4. Establish the functions of an operating system for embedded systems and provide examples of such systems. (3)
5. Discover the role of a scheduler in a real-time operating system. (3)
6. Appraise and anticipate the challenges associated with testing and debugging embedded systems and devise strategies to overcome them. (3)

OR

Categorize the different types of embedded memories and infer their functions in an embedded system. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Express the salient feature of JTAG. (5)
8. Write the various types of memory in embedded systems. (5)
9. Determine the salient feature of coprocessor 286. (5)
10. Describe the 8051 microcontroller and its families. (5)
11. Describe OS tasks. (5)
12. Judge Semaphore, Message Queues. (5)

OR

Summarize Mail Boxes and pipes. (5)

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