BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(RA)-2022
Course Name – Embedded System for Robotics
Course Code - PCC-ECR502
(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) Harvard architecture allows:

a) a. separate program and data memory b) b. pipe-ling
c) c. complex architecture d) d. all of the mentioned

(ii) Define the primary function of a microprocessor.

a) Execute instructions and perform data processing b) Store data and run applications
c) Display graphics and images d) Connect to the internet and browse websites

(iii) Define the main purpose of a microcomputer.

a) Execute complex mathematical calculations b) Control external devices and systems
c) Provide a central processing unit (CPU) d) Store and manage large datasets

(iv) Indicate the primary focus of microprocessor generation.

a) Increasing clock speed b) Enhancing architectural features
c) Reducing power consumption d) Expanding peripheral connectivity

(v) Identify the generation of microprocessors that introduced the concept of a 32-bit architecture.

a) 1st generation b) 2nd generation
c) 3rd generation d) 4th generation

(vi) Identify the generation of microprocessors that first introduced multi-core processors to mainstream computing.

a) 2nd generation b) 3rd generation
c) 4th generation d) 5th generation

(vii) Select from the following: The generation of microprocessors is associated with the transition from 32-bit to 64-bit architectures in personal computing.

a) 4th generation
b) 5th generation
c) 6th generation
d) 7th generation

(viii) Select the primary consideration when evaluating a microprocessor for embedded systems and IoT devices.

a) Clock speed
b) Power efficiency
c) Number of cores
d) Instruction set complexity

(ix) Identify the data bus width of the Intel 8085 microprocessor.

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

(x) Select the register that is used as the stack pointer in the Intel 8085 architecture.

a) Accumulator
b) Program Counter
c) Stack Pointer
d) Temporary Register

(xi) Identify the size of the memory address space that the Intel 8085 can access directly.

a) 64 KB
b) 128 KB
c) 256 KB
d) 512 KB

(xii) Define the flag in the flag register of the Intel 8085 to indicate overflow.

a) OV (Overflow Flag)
b) CY (Carry Flag)
c) Z (Zero Flag)
d) S (Sign Flag)

(xiii) In the Intel 8085 architecture, select the pin used to indicate the start of an instruction cycle.

a) S0
b) S1
c) RD
d) WR

(xiv) Define the clock frequency range for the Intel 8085 microprocessor.

a) 1 MHz to 2 MHz
b) 2 MHz to 4 MHz
c) 4 MHz to 8 MHz
d) 8 MHz to 16 MHz

(xv) Define the purpose of the INR instruction in the Intel 8085.

a) Increment the content of a memory location
b) Increment the accumulator
c) Increment the stack pointer
d) Increment the program counter

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define embedded system. (3)

3. Demonstrate the role of microcontroller in embedded system. (3)
4. Define real-time programming language with example. (3)
5. Differentiate between embedded systems and general-purpose computing systems. (3)
6. Analyze the importance of power consumption in embedded systems and propose techniques to minimize it. (3)

OR

Appraise and anticipate the challenges associated with testing and debugging embedded systems and devise strategies to overcome them. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Anticipate the difference between microprocessor and microcomputer. (5)
8. Express the classification of embedded system with example. (5)
9. Describe Timer and Counters of Microcontroller. (5)
10. Examine Serial and parallel data Communication interfacing. (5)
11. Write about the features of an ARM processor. (5)
12. Explain the various type of A/D converter. (5)

OR

Articulate the working procedure of successive type D/A converter. (5)

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