



BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Tech.(ECE)-2019
Course Name – Embedded System
Course Code - PEC-ECCL801A
(Semester VIII)

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) Cite the definition of an embedded system.
- | | |
|--|---------------------------------------|
| a) A system that is easily removable | b) A system that is stationary |
| c) A system that is designed to perform specific tasks | d) A system that can perform any task |
- (ii) Compare and contrast a general-purpose computer and an embedded system to identify their main difference.
- | | |
|---|---|
| a) An embedded system is less expensive | b) An embedded system is more powerful |
| c) An embedded system is designed for a specific task | d) An embedded system is more user-friendly |
- (iii) Express the primary function of an embedded system.
- | | |
|-------------------------------|-----------------------------------|
| a) To perform a specific task | b) To run multiple applications |
| c) To access the internet | d) To store large amounts of data |
- (iv) Classify which of the following is not an example of an embedded system.
- | | |
|----------------------|-----------------------|
| a) A washing machine | b) A traffic light |
| c) A laptop computer | d) A smart thermostat |
- (v) Show the main benefit of using an embedded system.
- | | |
|--|---------------------------------------|
| a) It is easier to program | b) It is more user-friendly |
| c) It is more powerful than a general-purpose computer | d) It is designed for a specific task |
- (vi) Articulate the concept of embedded memories to provide a clear explanation.
- | | |
|---|---|
| a) Memories that are not physically embedded in a system. | b) Memories that are integrated into a system's chip. |
| c) Memories that are attached to a system using cables. | d) Memories that are stored on an external device. |
- (vii) Calculate the storage capacity of a 64-kilobit memory using a mathematical formula.
- | | |
|----------------|-----------------|
| a) 8 kilobytes | b) 64 kilobytes |
|----------------|-----------------|

- c) 8 megabytes
d) 64 megabytes
- (viii) Change the contents of an embedded memory by modifying its data.
a) It is not possible to change the contents of an embedded memory.
b) Overwriting the memory with new data.
c) Physically replacing the memory chip.
d) Adding an external memory to the system.
- (ix) Chart the various types of embedded memories to create a visual representation.
a) SRAM, DRAM, and ROM.
b) USB, SD, and MMC.
c) SATA, SCSI, and SAS.
d) Wi-Fi, Bluetooth, and NFC.
- (x) Choose the appropriate type of memory for a specific application based on its requirements.
a) Using SRAM for high-speed data storage.
b) Using DRAM for low-power applications.
c) Using ROM for program code storage.
d) All correct options.
- (xi) Relate the electronic thermostat used to regulate the temperature of a room to the type of embedded system it is.
a) Industrial control system
b) Medical system
c) Automotive system
d) Consumer system
- (xii) Differentiate a digital camera from a smartphone in terms of embedded systems by examining their components and functionalities.
a) Cameras have more processing power
b) Smartphones have more sensors
c) Cameras have higher quality lenses
d) Smartphones have more memory
- (xiii) Asking for the name of the process of removing noise from a signal.
a) filtering
b) modulation
c) amplification
d) demodulation
- (xiv) Give an example of a digital signal in embedded systems and associate it with the appropriate type.
a) Temperature
b) Pressure
c) Binary data
d) Sound
- (xv) Describe a signal conditioning circuit that converts an analog signal to a digital signal, and explain its function.
a) Digital-to-analog converter
b) Analog-to-digital converter
c) Amplifier
d) Filter

Group-B

(Short Answer Type Questions)

3 x 5=15

2. State the purpose of embedded memory. (3)
3. Explain analog interfacing in embedded systems. (3)
4. Implement signal conditioning in embedded systems. (3)
5. Classify the different types of embedded memories. (3)
6. Analyze the importance of power consumption in embedded systems and its impact on system performance. (3)

OR

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

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Design an embedded system by considering relevant factors. (5)
8. Explain the concept of an operating system for embedded systems and develop the advantages of using an operating system in an embedded system. (5)
9. Develop a chart to compare the features and capabilities of commonly used embedded microcontroller cores. (5)

10. Categorize the different types of embedded memories and evaluate their functions in an embedded system. (5)
11. Explain the concept of DACs and how they are employed in embedded systems. (5)
12. Differentiate the concept of I2C and infer its role in interfacing with external systems in embedded systems. (5)

OR

Connect the role of drivers in interfacing with external systems in embedded systems and assemble the different types of drivers used. (5)
