Manmohan Technical University
Office of the Controller of Examinations
Exam Year: 2081, Mangsir (Model Question)

Exam Roll: ……
Exam Roll in words: ……

School: SOE	Level: BE	Invigilator's Sign: ……
Program: BEEE	Year/Part: III/I	Superintendent's Sign: ……
Subject: Embedded Systems (EG602EX)		Code No. ……

i. Answers should be given by filling the Multiple-Choice Questions' Answer Sheet.
ii. The main answer sheet can be used for rough work.

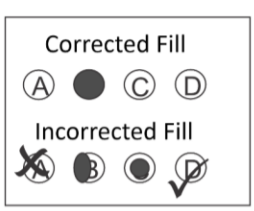
Code No.

GROUP A *(Multiple-Choice Questions)*	**[10x1=10]**	**Time: 20 Minutes**

1. . Which component is used for storing data temp orarily in an embedded processor?
   a) ROM
   b) RAM
   c) ADC
   d) DAC
2. **What is the primary function of a Watchdog Ti mer in an embedded system?**
   a) Perform real time digital signal processing
   b) Reset the system if it hangs or crashe s
   c) Manage power consumption
   d) Handle input/output operations
3. **. RS232 operates at speeds typically up to .....bits per second (bps).**
   a) 9,600
   b) 19,200
   c) 115,200
   d) 1,000,000
4. **What is the first step in the embedded produc t development life cycle?**
   a) Design
   b) Testing
   c) Requirement Analysis
   d) Deployment
5. **In the sequential program model, how is the c ontrol flow determined?**
   a) By events and conditions
   b) By predefined sequential steps
   c) By hardware interrupts
   d) By user interactions
6. **Which of the following is a characteristic of a hard real-time system?**
   a) Missing a deadline can be tolerated
   b) Deadlines are not critical
   c) Missing a deadline can cause catastrophic failure
   d) Deadlines are flexible
7. **What is interrupt latency?**
   a) The time taken to execute an interrupt service routine
   b) The time taken to respond to an interrupt
   c) The time taken to disable interrupts
   d) The time taken to enable interrupt
8. **What is the primary function of the control unit in a washing machine?**
   a) To heat the water
   b) To control the washing cycles based on sensor inputs
   c) To drain the water
   d) To spin the drum
9. **How does the ATM's embedded system handle mu ltiple transactions simultaneously?**
   a) Multithreading
   b) Single-threading
   c) Multitasking
   d) Batch processing
10. **In a digital camera, what is the primary purpose of the firmware?**
    a) Controlling the hardware components and managing functions
    b) Enhancing the image resolution
    c) Improving battery life
    d) Connecting to the internet

Multiple Choice Questions' Answer Sheet

Marks Secured: _____
In Words: _____
Examiner's Sign: _____ Date: _____
Scrutinizer's Marks: _____
In Words: _____
Scrutinizer's Sign: _____ Date: _____



1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Manmohan Technical University
Office of the Controller of Examinations
Exam Year: 2081, mangsir

School: SOE	Level: BE	Time: 3 Hours
Program: BEEE	Year/Part: III/I	Full Marks: 50
Subject: Embedded Systems (EG602EX)		

- ✓ *Candidates are required to give their answers in their own words as far as practicable.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary*.

GROUP A *(Multiple-Choice Questions in separate paper)*

GROUP B ***(****Short Answer Questions - **Attempt All Question)*** **[8 X 2=16]**

1. What is the primary function of a Watchdog Timer in an embedded system?
2. What are the main roles in an SPI communication setup?
3. What is the main difference between a task and a process in an RTOS?
4. Explain the difference between binary and counting semaphores.
5. What are the main advantages of using a concurrent model in an embedded system?
6. How is the system architecture typically documented during the design phase?
7. How do embedded systems contribute to vehicle safety and security?
8. How does the embedded system manage the different wash cycles in a washing machine?

GROUP C ***(****Long Answer Questions* – Attempt any Six Questions) **[6 X4=24]**

9. **Explain the role and importance of the microcontroller (MCU) in an embedded system. Discuss its key components and how they contribute to the overall functionality of the system.**

10. **Describe the RS422 communication protocol in detail. What are its main advantages over RS232, and in what types of applications is it most commonly used?**

11. **Explain the key stages involved in the embedded firmware development lifecycle. Discuss each stage, from initial conceptand requirements gathering through to deployment and maintenance, including the tools and techniques commonly used.** [4]
12. **Discuss the concept of priority inversion in RTOS and the techniques used to prevent it. How do priority inheritance and priority ceiling protocols work to address this issue?**

13. **Explain the architecture of an ATM machine and how embedded systems are integrated into its operation.**

14. **Describe the role of the microcontroller in a washing machine's embedded system. Discuss how it coordinates various functions such as water level sensing, motor control, and user interface management.**
15. **How does an embedded system designer ensure that necessary interrupts are properly addressed and unnecessary interrupts are avoided? Provide examples to support your explanation.**

THE END