

B.E./B.TECH. Degree Examination, December 2020

Semester – VI

**EE16604-Embedded Systems**

(Regulation 2016)

Time: Three hours

Maximum: 80 Marks

Answer **ALL** questions

**PART A - (8 X 2 = 16 marks)**

1. How the input terminals of embedded system are associated with external environments?
  - a) Actuators
  - b) Sensors
  - c) Inputs
  - d) Outputs
2. Which of the following is the pin efficient method of communicating between other devices?
  - a) serial port
  - b) parallel port
  - c) peripheral port
  - d) memory port
3. Which of the following does not use a shared memory?
  - a) process
  - b) thread
  - c) task
  - d) kernel
4. In C, if you pass an array as an argument to a function, what actually gets passed?
  - a) Value of elements in array
  - b) First element of the array
  - c) Address of the last element of array
  - d) Base address of the array
5. List out the challenges in building embedded system
6. Give the limitations of polling technique
7. Compare preemptive and non-preemptive scheduling
8. List the data types in Embedded C

**PART B - (4 X16 = 64 marks)**

9. (a) (i) List the hardware units that must be present in the embedded systems (8)  
and discuss about them in detail
- (ii) Compare in detail the In-circuit Emulator and Emulator with suitable (8)  
diagrams

**(OR)**

- (b) (i) With a neat diagram of a DMA controller, describe its buses and control (10)  
signals
- (ii) Illustrate a hardware timer device with its signals, clock inputs and (6)  
control bits
10. (a) (i) Compare in detail the advantages and disadvantages of data transfer (8)  
using serial and parallel port devices
- (ii) Compare in detail the RS-232C and RS-485 serial interfaces (8)

**(OR)**

- (b) (i) Demonstrate the signal using a transfer of byte when using the I<sup>2</sup>C bus (8)  
and also the format of bits at the I<sup>2</sup>C bus with diagram
- (ii) Differentiate in detail process, task, and threads (8)
11. (a) (i) Enumerate type of semaphores and explain the use of semaphore in (8)  
detail
- (ii) Illustrate and explain in detail about the Inter process communication (8)  
and context switching

**(OR)**

- (b) Illustrate the SPI interface in STM32407xx (16)
12. (a) Design a Calculator program using RS232 port (16)

**(OR)**

- (b) Design a digital thermometer with high alarm output using STM32407XX (16)