Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

MCA (2012 & Onwards) (Sem.–5)

EMBEDDED SYSTEMS

Subject Code : MCA-501

Paper ID : [A3159]

Time : 3 Hrs. **Max. Marks : 100**

INSTRUCTIONS TO CANDIDATES :

1. **SECTIONS-A, B, C & D contains TWO questions each carrying TWENTY marks each and students have to attempt any ONE question from each SECTION.**
2. **SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.**
3. **Use of non-programmable scientific calculator is allowed.**

SECTION-A

1) What is an embedded system? What are the typical characteristics of an embedded system? Explain its application with examples.

2) a) What are the different challenges associated with the design of embedded systems? List its various design parameters.

   b) Explain various design, development and testing tools for embedded systems.

SECTION-B

3) Explain the basic architecture of embedded system. What is the need for IDE in an Embedded Architecture? Discuss.

4) Write short notes on :

   a) Analog to digital converter

   b) Working of timers and counters in PIC16F877A.

SECTION-C

5) What are the advantages of Assembly language programming over high level language programming? What is the use of interrupt service routines for interrupt handling?

6) Write short notes on :

a) Memory-mapped I/O

b) PIC16F877A instruction set.

SECTION-D

7) Explain design steps involved in designing an adaptive cruise control system in a car with neat diagram.

8) Explain digital signal processing (DSP) in embedded system (ES). How continued digitization of signals is increasing the role of DSP in E?

SECTION-E

9) **Write briefly :**

a) Differentiate between microcontroller and microprocessor.

b) What are the real-time requirements of an embedded system?

c) What are recent trends in embedded systems?

d) Define embedded microcontroller.

e) What does the execution unit of a processor in an embedded system do?

f) Name the addressing modes supported by PIC microcontrollers PIC16F877A.

g) What is USB? Where is it used?

h) Explain the synchronous and asynchronous communications from serial devices.

i) Explain how software is embedded into a system.

j) What are assembler directives?