

Total No. of printed pages = 3

ECE 1816 OE 11

10782

Roll No. of candidate

--	--	--	--	--	--	--	--	--	--

2022

BINA CHOWDHURY CENTRAL LIBRARY
(CIMIT & GIPS)
Azara, Hatkhowapara,
Guwahati -781017

B.Tech. 6th Semester End-Term Examination

ADVANCED MICROCONTROLLERS

(New Regulation and New Syllabus)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer Question No. 1 and any *four* from the rest. Answers may be written for generalized microcontroller. Missing data, if any, should be assumed accordingly.

1. Answer the following (MCQ/ Fill in the blanks) : (10 × 1 = 10)
- (i) If the starting address of RAM is 8000H and the end address is 8FFFH, size of RAM is-
- (a) 1 Kb (b) 2 KB
(c) 4 KB (d) 8 KB
- (ii) The flag register in 8051 is called-
- (a) DPTR (b) PSW
(c) TCON (d) IE
- (iii) Default register bank when 8051 is powered on is-
- (a) Bank 1 (b) Bank 2
(c) Bank 3 (d) Bank 0
- (iv) Size of the Stack pointer register in 8051 is-
- (a) 4 bit (b) 6 bit
(c) 7 bit (d) 8 bit
- (v) Each port line of a port can individually source a current of up to-
- (a) 0.2 mA (b) 0.25 mA
(c) 0.5 mA (d) 0.75 mA

[Turn over

(vi) The number of TTL inputs that can be sunk by the port 0 when a logic 0 is sent to a port line as an output port is-

- (a) 2 (b) 4
(c) 6 (d) 8

(vii) The open drain bidirectional (input or output) port with internal pull ups is-

- (a) port 0 (b) port 1
(c) port 2 (d) port 3

BINA CHOWDHURY CENTRAL LIBRARY
(GIMT & GIPS)
Azara, Hatkhowapara,
Guwahati -781017

(viii) The file register space in PIC are divided in to (PIC 16F877 or PIC18F458)-

- (a) 256 bytes bank (b) 128 bytes bank
(c) 64 byte bank (d) 512 bytes bank

(ix) Fold back memory is generated in-

- (a) Linear decoding (b) Absolute decoding
(c) Peripheral mapped I/O (d) Memory mapped

(x) In an 8-bit processor with 16 bit address lines, the higher and lower order addresses are same in-

- (a) Memory mapped I/O (b) Linear decoding
(c) Absolute decoding (d) Peripheral mapped I/O

2. (a) Compare Embedded system and General computing systems. What are the major area of application of Embedded system. (5)
(b) Explain the working of a four level deep pipelined architecture. (5)
(c) Explain the methodologies adopted for increasing processing speed and reducing power consumption in embedded design. (5)
3. (a) Make a comparative discussion among RISC, CISC and VLIW architecture. (5)
(b) Explain the method of interfacing an external ADC 0848 (or other) with a microcontroller in general. (5)
(c) What are the additional features of PIC over 8051? Describe the Capture-Compare PWM(CCP) module. (5)
4. (a) Write the CAN (Controller area network) protocol ISO 11898-1:2015 standards. (5)
(b) Describe the features that a RTOS must inherit. (5)
(c) State the design process of a microcontroller based contactless thermometer using diagram representing the components and sensor interconnections. (5)

5. (a) Draw the architecture of 8051. Explain the memory organisation of it. (7)
- (b) Explain the implementation of brown out reset procedure and also its usage with a suitable diagram. (4)
- (c) Implement a watchdog timer and also explain its usage with a suitable diagram. (4)
6. (a) Discuss the waterfall model in Embedded system design. What are its disadvantages? (6)
- (b) Describe the memory organization (RAM and ROM) of PIC 16F877 or PIC18F458. (4)
- (c) Using the bit format of the INTCON register of the PIC microcontroller, describe the functions of the individual bits. (5)
7. Write a description of any *three* of the following. (5+5+5)
- (a) Relation between embedded system and IOT
- (b) Use of embedded system in ergonomics
- (c) $I^2C(I2C)$ protocol
- (d) Embedded product development life cycle.

BINA CHOWDHURY CENTRAL LIBRARY (5+5+5)
(OIMT & GIPS)
Azara, Hatkhowapara,
Guwahati - 781017