MINOR-1, Nov 2020 (Online mode)

BE ECE-5th semester, Section-1&2

Subject: Advanced Microcontroller and Applications (EC506) (Theory)

Max marks: 30 **Time: 90min (writing exam) + 15 min (scan and upload)**

Attempt any 3 questions:

1. a) What does the term embedded system mean? Write five examples of embedded system to support your answer. (5)

   b) Explain briefly internal block diagram of Atmega8 microcontroller. Discuss AVR Atmega8 features. (5)

2. a) Explain with suitable diagram the configuration on-chip ADC of AVR. (5)

   b) A 10 bit ADC of Atmega8 has to perform successive approximation conversion of an analog input 10.2 V, Vref of ADC is 15 V. Show step by step conversion of such ADC. How will you store the result of conversion when ADLAR=1. (5)

3. Differentiate between T0, T1 and T2 timers in Atmega8. Using CTC mode of Timer2, write a program to generate a delay of 8ms. Assume XTAL = 8MHz. How will you configure TCCR2 for this delay? (10)

4. a) Show a simple code to i) load the value $15 into location $67, and ii) add it to R19 five times and place the result in R19 as the values are added. R19 should be zero before the addition starts. (5)

   b)

Find the C flag value after each of the following codes:

```
(a) LDI  R20,0x54      (b) LDI  R23,0       (c) LDI  R30,0xFF
    LDI  R25,0xC4          LDI  R16,0xFF        LDI  R18,0x05
    ADD  R20,R25           ADD  R23,R16         ADD  R30,R18
```

(5)