Hall Ticket No | | | | | | | | | | | Question Paper Code: AEC022

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech VI Semester End Examinations (Regular), November – 2020

Regulation: IARE–R16

MICROCONTROLLERS AND DIGITAL SIGNAL PROCESSING

Time: 2 Hours **(EEE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Illustrate the pin diagram of 8051 microcontroller. **[5M]**
2. Explain the instruction set of 8051 microcontroller with examples **[5M]**
3. Illustrate keyboard interfacing to 8051 microcontroller with neat sketch. **[5M]**
4. Write the Z-transform of the finite-duration signal x(n)={1,2,5,7,0,1}. **[5M]**
5. Mention the differences between IIR filter and FIR filter & write the features of Hanning window spectrum. **[5M]**
6. Discuss about the counters and timers in 8051 microcontroller. **[5M]**
7. List out the features of special function registers of 8051 microcontroller. **[5M]**
8. Classify the types of serial communication with examples. **[5M]**

PART – B

9. Sketch the architecture of 8086 miroprocessor. Explain why the architecture is divided into two functional blocks. **[10M]**
10. Explain the internal and external interrupts of 8051 microcontroller. **[10M]**
11. What is the need of addressing modes? Explain the addressing modes used in 8051 with one example for each. **[10M]**
12. Write an ALP to multiply the numbers 0BDH, 15H using the technique of repeated addition. **[10M]**
13. Draw the interfacing diagram of digital to analog converter (DAC) to 8051 microcontroller & explain it. **[10M]**
14. Write an ALP to display 0-9 digits using 7-segment display in common cathode mode. **[10M]**
15. Check whether the following system is i) Linear ii) Causal iii) Stable iv) Time invariant
$y(n) = \log_e |x(n)|$ **[10M]**
16. How IDFT can be obtained from DFT? Find the IDFT of X(k)={4, -j2, 0, j2} using DFT. **[10M]**
17. What are the important features of FIR filter and explain advantages and disadvantages of FIR filters over IIR filters. **[10M]**
18. Design a low-pass butterworth digital filter to give response of 3dB or less frequencies upto 2kHz and an attenuation of 20dB or more beyond 4kHz. **[10M]**