(3 Hours) Max Marks: 80

Note:
1. **Question No. 1 is compulsory.**
2. **Out of remaining questions, attempt any three questions.**
3. **Assume suitable additional data if required.**
4. **Figures in brackets on the right hand side indicate full marks.**

1. **(A)** Explain interrupt pins of 8085. **(05)**

   (B) Explain in brief about programmable interrupt controller 8259. **(05)**

   (C) Explain advantages of memory segmentation of 8086. **(05)**

   (D) Write control word of 8255 to initialize port A as input port, port B and C as output port, Group A and B in mode 0. **(05)**

2. **(A)** Explain minimum mode of 8086 microprocessor. Draw timing diagram for read operation in minimum mode. **(10)**

   (B) Write a program to set up 8253 as square wave generator with 1 ms period if input frequency of 8253 is 1 MHz. **(10)**

3. **(A)** Draw and explain interfacing of DAC 0808 with 8086 microprocessor using 8255. Write a program to generate square wave. **(10)**

   (B) Explain 8086 interrupt structure. **(10)**

4. **(A)** Describe in brief and compare architecture of 80286 and 80486 microprocessor. **(10)**

   (B) Explain Modes of 8254 Timer/Counter peripheral IC with the help of timing diagram. **(10)**

5. **(A)** Draw and Explain interfacing of Math co-processor with 8086. **(10)**

   (B) Explain addressing modes of 8086 microprocessor **(10)**

6. **(A)** Explain different modes of operation of 8257 DMA controller. **(10)**

   (B) Discuss the functions of general purpose registers of 8086. Explain the function of each register and instruction support for these function. **(10)**

(3 Hours) [Total Marks: 80]

N.B.:
1. Question No.1 is compulsory.
2. Attempt any three questions out of the remaining five.
3. Assume suitable data wherever necessary.

Q1 Answer the following 20

a) Determine discrete time Fourier series of x (n) = cos2 ($\frac{\pi}{6} n$)

b) Explain in brief Region of convergence (ROC) for Laplace transform.

c) Test the causality of the following system.

1) y (t) = x(t) – x(t-1) 2) y(t) = x(t) + 3x(t+4)

d) Sketch signal e^{-6t} u(t) and determine power and energy of signal

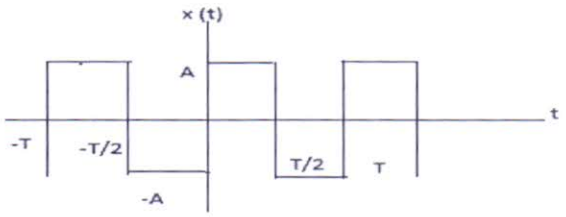
e) State and prove linearity property of Z-transform

Q2. a) Obtain bilateral inverse Laplace transform of the function: 10

$X(s) = \frac{3s+7}{(s^2-2s-3)}$

Find ROC of Re(s) > 3

b) Determine the Fourier series of the following signal: 10



Q3. a) Compute the convolution y (n) = x (n) * h (n) using tabulation method 10

Where x (n) = { 1, 1, 0, 1,1 } and h (n) = { 1, -2 , -3 , 4 }

b) Determine the Fourier transform of following continuous time domain signal. 10

i) x (t) = 1- t^2 ; for |t| < 1

= 0 ; for |t| > 1

Q4. a) A stable system has input x (t) and output y (t). Determine transfer function and Impulse response h (t) by using Laplace transform. 10

x (t) = e^{-2t} u(t) ; y(t) = -2 e^{-t} u(t) + 2 e^{-3t} u (t)

b) State and prove following properties of Fourier transform. 10

(i) Time shifting property

(ii) Time Reversal Property

Q5. a) An LTI system is described by the equation: 10

y (n) = x(n) + 0.8 x(n-1) + 0.8 x(n-2) – 0.49 y (n-2) , determine the transfer function of the system and also sketch the poles and zeros on the z-plane .

b) Obtain and sketch the impulse response of the shift invariant system described by 10
$y(n) = 0.4\,x(n) + x(n-1) + 0.6\,x(n-2) + x(n-3) + 0.4\,x(n-4)$

Q6. a) Using Z- transform, determine the response of the LTI system with impulse response, 10
$h(n) = \{1, -1, 1\}$, for an input $x(n) = \{-2, 3, 1\}$

b) Explain Gibbs Phenomenon 05

c) List the properties of ROC for Z- transform. 05

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