

Time: 3 hours

Total Marks: 80

Note: 1) Question No.1 is compulsory.

2) Attempt any three questions from remaining five questions.

3) Assume suitable data if necessary.

4) Figures to the right indicate full marks.

- Q.1) Explain in brief
- a) Integral controller 5M
 - b) Telemetry 5M
 - c) I-P converter 5M
 - d) Pneumatic logic gates 5M
- Q.2) a) Compare conventional and smart transmitters. Explain the working of DP transmitter. 10M
- b) What are the different characteristics of data loggers? Draw the block diagram of data logger and explain its working? 10M
- Q.3) a) Explain compressed air receiver unit. What are the different control strategies for air receiver unit? 10M
- b) Explain detail cylinder construction with its dynamics. 10M
- Q.4) a) What is the need of composite controller? Explain PI controller in detail. 10M
- b) Give the classification of compressors. Explain any two rotary compressors with diagram. 10M
- Q.5) a) Explain loading of valves in pump application with diagram. 10M
- b) Give the classification of control valve based on characteristic, plug design etc. 10M
- Q.6) a) Give the comparisons of electrical, hydraulic and pneumatic systems. 10M
- b) Brief the classification of hydraulic pumps. Draw neat sketches of any three hydraulic pumps and explain the working. 10M

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Q1(a) Explain restoring division algorithm and draw its flowchart.

(b) Describe the concept of Nanoprogramming.

(c) Compare paging and segmentation.

(d) Draw the register structure of IA-32 family

Q2 (a) What is the necessity of replacement algorithm? Explain how pages are replaced between cache memory and main memory using replacement policies:

(i) LRU (ii) FIFO

(b) Explain the structure of serial and parallel ports. What are the methods to access it?

Q3 (a) Explain in detail any one hardwired technique of control unit design.

(b) Explain various DMA transfer modes with diagrams.

Q4 (a) Explain the advantages of pipelining. Explain various types of pipeline hazards and solutions to prevent them.

(b) Explain concept of cache memory with reference to principle of locality and Hit ratio. Draw and explain different architectures of cache memory.

Q5 (a) What are different addressing modes of IA-32 family? Explain with examples.

(b) Explain single bus and multiple bus organization.

Q6 (a) Explain the Virtual Address to Physical address Translation for the following specifications Virtual Memory=128k and Main Memory=32k, page size = 1k. Illustrate Page Fault with the help of an example.

(b) Explain execution of a complete instruction with details. How are branch instructions executed? Use Single Bus organization.

TE-sem VI - CBGS - Modern Information Tech. for
Management.

Q.P. Code: 35380

Duration: 2 Hours

11/10/18

ETRP

Marks-40

Note:

- i. Q.1 is compulsory
- ii. Attempt any three questions from remaining five.
- iii. Each question carries equal marks.

1. Answer any five.
 - a. Which are the components of IT Infra? 2
 - b. Write any four top security concerns. 2
 - c. Explain optical storage. 2
 - d. Explain World Wide Web. 2
 - e. What do you mean by cabling? 2
 - f. Define Information architecture. 2
 - g. Differentiate between single mode and multimode fiber. 2
2.
 - a. Define topology. Explain any three common topologies. 5
 - b. Explain wireless LAN technologies with their advantages. 5
3.
 - a. Explain Simple Network Management Protocol 5
 - b. Explain seven layer OSI stack. 5
4.
 - a. Illustrate Enterprise Resource planning (ERP) and its need in detail. 5
 - b. Write a short note on following web authoring tools. 5
 - i) SGML
 - ii) HTML
5.
 - a. Which are the three main types of storage? Write a short note on each. 5
 - b. Explain Password management System 5
6. Write a note on following terms related to IT audit. 10
 - i) Information audit.
 - ii) Audit schedule
 - iii) Audit plan
 - iv) Audit preparation
 - v) Internal audit.

Time 3 hours

Marks: 80

- N.B: (1) Questions NO.1 is compulsory.
(2) Attempt any three questions out of remaining five questions.
(3) Assume suitable data if required.
(4) Figures to the right indicate full marks.

Q 1. Solve any four

20

- a. Determine the zeros of the following systems and indicate whether the system is minimum, maximum or mixed phase.

1) $H_1(z) = 6 + z^{-1} + 6z^{-2}$

2) $H_2(z) = 1 - z^{-1} - 6z^{-2}$

- b. What is multirate DSP? State its applications
c. Compare BLT and impulse invariant method.
d. Explain concept of decimation by integer D.
e. If $X(K) = \{16, -4, 0, -4\}$, determine $x[n]$ using IFFT.

Q 2. a) If $x(n) = \{1, 2, 3\}$ and $h(n) = \{1, 0\}$

- 1) Find linear convolution using circular convolution.
2) Find circular convolution using DFT-IDFT.

10

- b) Show the mapping from S plane to Z plane using impulse invariant method. Explain its limitations. Using this method determine $H(z)$ if

$$H(s) = \frac{2}{(s+1)(s+2)} \quad \text{if } T_s = 1s.$$

10

Q3. a) Compute DFT of sequence $x(n) = \{1, 2, 3, 4, 5, 6, 7, 8\}$ using DIT-FFT algorithm.

10

- b) Design low pass IIR Butterworth filter for following specifications

Passband attenuation = 1dB

Stopband attenuation = 40dB

Passband edge frequency = 200Hz

Stopband edge frequency = 540Hz

Sampling frequency = 8KHz

Use Bilinear transformation method.

10

Q 4. a) A low pass filter is to be designed with following desired frequency response.

$$H_d(e^{j\omega}) = e^{-j2\omega} \quad -\frac{\pi}{4} \leq \omega \leq \frac{\pi}{4}$$

$$= 0 \quad \frac{\pi}{4} < \omega \leq \pi$$

Determine the filter coefficients $h_d(n)$ if the window function is defined as

$$w(n) = 1 \quad 0 \leq n \leq 4$$

$$= 0 \quad \text{otherwise}$$

Also determine the frequency response $H(e^{j\omega})$ of the designed filter. 10

b) Find DFT of $x(n) = \{1, 2, 3, 4\}$. Using these results not otherwise find DFT

- i) $x_1(n) = \{4, 1, 2, 3\}$
- ii) $x_2(n) = \{2, 3, 4, 1\}$
- iii) $x_3(n) = \{6, 4, 6, 4\}$ 10

Q 5 a) Explain subband coding of speech signal as a application of multirate signal processing. 10

b) Determine the Direct form-I and Direct form-II realization for the system $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$. 10

Q6. Write Short note on

- a) Dual Tone Multifrequency Detection using Goertzel's algorithm 07
- b) The effects of coefficients quantization in FIR filters. 07
- c) Concept of interpolation by integer factor I 06

TE. ETRX- CBGS- Design with Linear
Integrated Circuits

21/05/2018

O.P. CODE: 34636

[Time: 3:00 Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question 1 is compulsory
 2. Attempt any three out of remaining five questions
 3. Assume suitable data if required
 4. Figures to the right indicate full marks

Q.1 Attempt any four :-

- A. An opamp operates as a unity gain buffer with 3VPP square wave input. If opamp is ideal with slew rate 0.5V/microseconds, find the maximum frequency of operation. (20)
- B. Draw the circuit diagram of opamp as an averaging amplifier and derive the expression of output voltage.
- C. Draw the circuit diagram and explain the operation of zero crossing detector.
- D. Explain specifications of DAC.

- Q.2
- A. Draw the circuit diagram and explain the operation of V-I converter. State its application areas. (10)
 - B. Design first order low pass filter using opamp at a cut off frequency of 1Khz, having pass band gain of 2. (10)

- Q.3
- A. Draw the circuit diagram and explain the operation of precision full wave rectifier. Derive the expression of output voltage. (10)
 - B. Design square wave generator using opamp to have output voltage = ± 5 volts, frequency 1 khz, with 70% duty cycle? (10)
Assume $V_{CC} = \pm 12$ volts.

- Q.4
- A. Draw neat circuit diagram and explain the operation of successive approximation type analog to digital converter. (10)
 - B. Draw neat circuit diagram and explain the operation of monostable multivibrator using IC 555. (10)

- Q.5
- A. Design a IC 555 based symmetrical square wave generator for 1 KHz frequency of $V_{CC} = 5$ V. Draw waveforms for voltage across timing capacitor and output.. (10)
 - B. Design a 0.5 A current source using IC 7805, for $R_L = 10$ ohms.? (10)

Q.6 Solve any Notes on any TWO of the following:

- A. Functional block diagram and working of IC 723. (10)
- B. Schmitt trigger and its applications. (10)
- C. RC phase shift oscillator using opamp (10)

TE-ETAX-Sem VI - Digital Signal and Processors

Processing
Q.P. Code: 27630

Time: 03 Hours

Marks: 80

CBGS - 05/06/18

N.B.

- 1) Question number ONE is compulsory.
- 2) Attempt any THREE questions from remaining questions.
- 3) All questions carry equal marks.

Q1] Answer any four questions

- a) Compare Butterworth and Chebyshev filters.
- b) Compare FIR and IIR filters.
- c) Compute the DFT of the sequence $x(n) = \{0, 1, 2, 1\}$
- d) What is Frequency prewarping in Bilinear transformation method? Why it is required.
- e) Explain the speed improvement in calculating the DFT using FFT.

Q2] a) Find DFT of the following sequence using DIT FFT algorithm.

$$x(n) = \{1, 1, 1, 1, 1, 1, 1, 0\}$$

b) Find the circular convolution of the two finite duration sequences

$$x_1(n) = \{1, -1, -2, 3, -1\} \quad x_2(n) = \{1, 2, 3\}$$

Q3] a) Design a Butterworth digital IIR low pass filter using Bilinear transformation by taking $T=1$ second, to satisfy the following specifications $0.707 \leq |H(e^{j\omega})| \leq 1.0 : 0 \leq \omega \leq 0.2\pi$

$$|H(e^{j\omega})| \leq 0.08 : 0.4\pi \leq \omega \leq \pi$$

b) Given that, $H(s) = 1/(s+1)$. By impulse invariant method, obtain the digital filter transfer function $y(n)$.

Q4] a) Explain different addressing modes of TMS 320 c67XX.

b) Explain VLIW architecture in detail.

Q5] a) Design a linear phase FIR highpass filter using hamming window, with a cutoff frequency, $\omega_c = 0.8\pi$ rad/sample and $N = 7$

b) Explain Frequency sampling method of designing FIR filter?

Q6] Write short notes on (any two)

- a) Effect of quantization in computation of DFT.
- b) Application of DFT to Radar signal Processing.
- c) Gibbs Phenomenon.