

REFERENCE

CSIT

Code No.: 4316/N

1

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April/May 2008

(New)

PROBABILITY AND RANDOM PROCESS

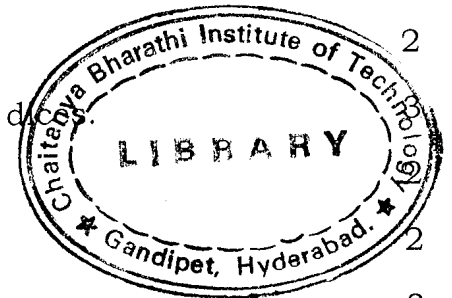
Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A.
Answer **five** questions from Part B.

Part A – (Marks : 25)

1. State and prove addition theorem of probability for three events. 2
2. Two dice are rolled 120 times find the average number of times in which the first dice exceeds the second dice. 3
3. Define two dimensional random variable, and state properties of Bivariate distribution function. 3
4. State the properties of probability density function. 2
5. Find the expectation and variance for sum 8 on the two dice. 2
6. State the properties of moment generating function. 2
7. Define White Noise. 2
8. State the central limit theorem and its significance. 3
9. Define the Poisson process and its significance in random process. 2
10. Give any three properties of Cross covariance. 3



Part B – (Marks : 5 × 10 = 50)

11. (a) State and prove Baye's theorem. 5
- (b) A box contains five balls, two balls are drawn and found to be white, what is the probability that all of the balls being white. 5
12. (a) Derive mean and variance for poisson random variable with a parameter ($\theta > 0$). 5

[P.T.O.]

(b) If x is a continuous random variable and probability function is

$$\frac{dF(x)}{dx} = \begin{cases} K x e^{-\lambda x} & x \geq 0 \\ \lambda > 0 & \\ 0 & \text{otherwise} \end{cases}$$

Find (i) K (ii) Variance.

5

Time :

Let X and Y be random variables with joint density function

$$f(x, y) = \begin{cases} 4xy & 0 \leq x \leq 1 \\ & 0 \leq y \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Find (i) $V(x)$ (ii) $V(y)$ (iii) $\text{cov}(X, Y)$.

10

1. De

2. Ex

3. Ex

4. Li

(a

5. W

6. L

7. V

8. I

9. I

10.

11.

a) Find auto correlation function of WSS random process is given by

$$R_{xx}(\tau) = \frac{4\tau^2 + 100}{\tau^2 + 4} \text{ and calculate mean of this process.}$$

5

b) Explain the properties of auto covariance.

5

c) Find the behaviour of the random process $X(t) = A \cos \lambda t + B \sin \lambda t$ (where A and B are R.V's).

5

d) Show that the random process $X(t) = A \cos(W_0 t + \theta)$ is wide sense stationary if A and W_0 are constants and θ is uniformly distributed r.v on $(0, 2\pi)$.

5

$Y(t) = A \cos(W_0 t + \theta) + N(t)$, where A is a constant, θ is a random variable with uniform distribution in $(-\pi, \pi)$ and $N(t)$ is a band limited Gaussian White noise with a power spectral density

$$S_{NN}(W) = \begin{cases} N_0/2 & \text{for } |w - w_0| < w_B \\ 0 & \text{elsewhere} \end{cases}$$

find the power spectral density of $\{y(t)\}$.

10

Define the terms :

Band pass process

3+4+3

Weiner - kinchine theorem

Ergodic process.

REFERENCE

CSIT

3

Code No.: 4317/N

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April/May 2008

(New)

SIGNALS AND SYSTEMS

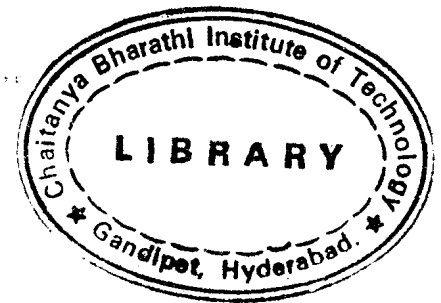
Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A.

Answer any **five** questions from Part B.

Part A - (Marks : 25)



1. Define Sa function.
2. Explain different representations of Fourier series.
3. Explain any 3 properties of laplace transform.
4. List out Fourier transform pairs for the following :
(a) $e^{-at}u(t)$ (b) $\text{sgn}(t)$
5. What is Region of convergence?
6. List out properties of correlation integrals.
7. What is BIBO stability?
8. Define SISO, MIMO.
9. Derive transfer function of a new system when the 2 systems are in Feedback loop.
10. What is an All-Integrator Block Diagram?

Part B - (Marks : $5 \times 10 = 50$)

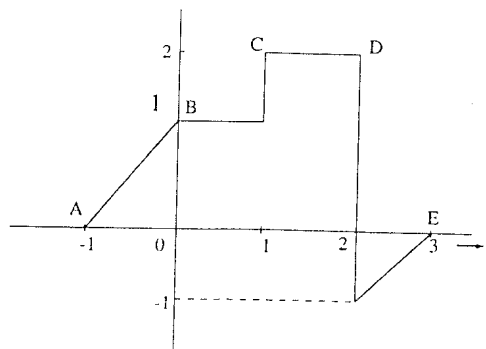
11. Referring to the following figure, sketch the following signals

(a) $x(t-2)$

(b) $x(1-t)$

(c) $x(2t+2)$

(d) $[x(t)+x(2-t)]u(1-t)$



[P.T.O.]

Explain state space Representation.

What are the properties of a system? Discuss them in detail.

State and prove Parseval's Energy Theorem.

Find the Laplace Transform of the following signals.

(i) $\sin \omega t u(t)$ (b) e^{-at} (c) $\cos^3 3t$

How do you Reconstruct a signal from samples?

Find $X(n)$ if $X(z) = \frac{1}{4(z-1)(z-1/4)}$, $\text{Roc} = \{ |z| > 1 \}$

Construct All-Integrator Block Diagram for the following state space Equations.

$$\dot{\vec{q}}(t) = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -a_0 & -a_1 & -a_2 \end{pmatrix} \begin{pmatrix} q_1(t) \\ q_2(t) \\ q_3(t) \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} x(t)$$

$$y(t) = [b_0 \quad b_1 \quad b_2] \vec{q}(t)$$

Explain Auto and cross correlation and their graphical interpretation.

Classify signals based on classes definitions and random nature.

Write short notes on the following:

Zero Order Hold

Discrete time systems.

Energy and power signals.

B.E.

Time : 3 H

1. What
2. List
3. Dete
follo

4. Dra
imp
5. Ex
6. Fo
ca

7. D
p
8. W
9. L
10. I

5

Code No.: 4318/N

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April/May 2008

(New)

ELECTRONIC COMMUNICATION TECHNIQUES

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A.

Answer **five** questions from Part B.

Part A – (Marks : 25)

1. What is balun? Draw two types of balun arrangements and Explain? 3
2. List the optical properties of radio waves? 2
3. Determine the overall noise factor for three cascaded amplifiers with the following parameters? 3
 $A_1 = 3\text{dB}$ $NF_1 = 10\text{dB}$
 $A_2 = 13\text{dB}$ $NF_2 = 6\text{dB}$
 $A_3 = 10\text{dB}$ $NF_3 = 10\text{dB}$
4. Draw the block diagram of 2-way FM transmitter and explain the part played by impairment? 3
5. Explain FM noise triangle. 2
6. For an earth station receiver with $T_e = 400\text{k}$, $B_n = 30\text{ MHz}$, $A_r = 44\text{dB}$ and a carrier frequency of 12GHz determine $\frac{G}{T_e}$, N_o and N . 3
7. Draw the block diagram of FM stereo and mono receiver and explain its basic principle of operation? 3
8. What is meant by the terms Noise factor and Noise figure? 2
9. List and Describe the four requirements of Feed Back oscillator to work? 2
10. Describe three point tracing. 2

[P.T.O.]

Part B - (Marks : $5 \times 10 = 50$)

		B
(a) Explain the working of an SSB transmitter?	5	
(b) Calculate the percentage saving in power if only one side band transmission is over the DSB - FC system at (i) 100% modulation (ii) 50 modulation.	5	
Define diversity. Describe the three most commonly used diversity schemes?	10	Time : 3
(a) Draw the block diagram for an Armstrong indirect FM Transmitter and explain its operation.	5	
(b) State Carson's general rule for determining the band width for an angle - modulated wave.	5	
(a) Define electro magnetic wave interference.	5	1. EX
b) Describe ground wave propagation. List advantages and disadvantages.	5	2. Dif
Define : (a) Antenna Polarisation	10	3. Co
(b) Antenna beam width		4. Di
(c) Antenna band width		5. W
(d) Near field and farfield		6. G
1) Explain in detail TDR Technique.	5	7. E
2) Explain in detail basic principles of FM Stereo broadcasting.	5	8. L
Write notes on :	10	9. C
1) IF amplifier circuit and its operation		10.1
2) Diversity Techniques.		11.
		12.
		13.

FACULTY OF INFORMATICS
B.E. II/IV Year (IT) II Semester (Main) Examination, April/May 2008
(New)

COMPUTER ORGANIZATION AND MICRO PROCESSORS

Time : 3 Hours]

[Max. Marks : 75

Answer all questions of Part A.
Answer five questions from Part B.

Part A – (Marks : 25)

1. Explain the functional units of computer? 3
2. Differentiate between multiprocessors and multi-computers? 2
3. Compare and contrast between programmed I/O and memory mapped I/O? 3
4. Differentiate little-endian and big-endian? 2
5. What is the purpose of TLB? 2
6. Give the advantages of BOOTH'S algorithm? 2
7. Explain Hardwired control and Microprogrammed control? 3
8. List out different registers in 8086? 3
9. Give the different types of instructions? 3
10. Define Macro? 2

Part B – (Marks : 5 × 10 = 50)

11. (a) Explain the evolution of computers. 5
- (b) Write about Historical perspective of computers. 5
12. Explain semiconductor memories. 10
13. (a) Write Booth's algorithm for multiplication. 5
- (b) Write an algorithm for division. 5

[P.T.O.]

4. Write on floating - point numbers and operations.	10	
5. Explain 8086 CPU architecture with neat sketch.	10	
6. Explain different instructions with one example for each instruction.	10	
7. Write short notes on :		Time
(a) Programmed I/O	5	
(b) Interrupt I/O.	5	

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

FACULTY OF INFORMATICS
B.E. II/IV Year (IT) II Semester (Main) Examination, April/May 2008
(New)

OOP USING JAVA

Time : 3 Hours]

[Max. Marks : 75

Answer all questions of Part A.
Answer five questions from Part B.

Part A – (Marks : $10 \times 2\frac{1}{2} = 25$)

1. Write a program to explain inheritance concept.
2. Explain about the interfaces.
3. What is the use of “finally” keyword?
4. Explain the methods with Thread States Diagram.
 (a) join () (b) yield ()
5. What is an applet?
6. Draw the Hierarchy of collection Interface.
7. What is the use of serialization?
8. Write a program to create a file with “file.txt” name and the file should hold the content “OSMANIA UNIVERSITY”, “HYDERABAD”.
9. Explain about Nested panels.
10. Explain about event listener Interfaces.

Part B – (Marks : $5 \times 10 = 50$)

- | | |
|--|---|
| 11. (a) Explain about the Garbage collection? | 4 |
| (b) Differentiate between Abstract class and Interfaces. | 6 |
| 12. (a) Write a program to print the content of a file on the console. | 5 |
| (b) Explain the exception handling process in Java. | 5 |

[P.T.O.]

- | | | Time |
|---|---|------|
| 3. (a) Differentiate between collections and collection. | 5 | |
| (b) Explain the legacy interfaces. | 5 | |
| 4. (a) Write the possible constructors used to create a file. | 4 | |
| (b) Write a program to explain the concept of serialization. | 6 | |
| 5. (a) Explain the life cycle of Applet. | 6 | |
| (b) List the Text Related GUI concepts. | 4 | 1. |
| 5. (a) Explain about Border Layout and Grid Layout. | 5 | 2. |
| (b) What is event handling? | 5 | 3. |
| 7. Write short notes on : | | 4. |
| (a) String Tokenizer. | 3 | 5. |
| (b) Delegation event model. | 4 | 6. |
| (c) How the string class is immutable? | 3 | 7. |
| | | 8. |
| | | 9. |
| | | 10. |
| | | 1 |
| | | 1 |

FACULTY OF INFORMATICS
B.E. II/IV Year (IT) II Semester (Main) Examination, April/May 2008
(New)

SOFTWARE ENGINEERING

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A.
Answer **five** questions from Part B.

Part A - (Marks : 25)

1. Define Software Engineering. 2
2. What is an Agile Process? 3
3. List the deployment principles. 3
4. Who are stakeholders? 2
5. What types of design patterns are available for the Software Engineers? 3
6. What are data objects and Data Attributes? 3
7. What is Software Architecture? 2
8. What are the 3 golden ruled used for user interface design? 3
9. What is verification and validation? 2
10. What is Regression testing? 2

Part B - (Marks : 5 × 10 = 50)

11. (a) Compare incremental process models and iterative process models. 4
(b) Write about any two Agile process models. 6
12. (a) What are the different functions of Requirements Engineering tasks? 5
(b) Explain about Hatley pirbhai system modeling. 5

[P.T.O.]

13. Draw and Explain about DFD, showing different levels for the following application.
You may make any reasonable assumption about this application. A salary system, which computes employee salaries and deductions. The input is a list of employee numbers who are to be paid that month. The system maintains tables holding tax rates and the annual salary for each employee. The output is a salary slip for each employee plus a list of automated payments to be made by the Company's bank. 10
14. (a) Write short notes on cohesion and coupling. 5
(b) Write short notes on Data designing. 5
15. (a) What are the steps for top-down integration? What are the problems that may be encountered when top down integration is chosen? 6
(b) Write about CMMI model. 4
16. (a) Write about system Testing? 5
(b) Write about Black box Testing? 5
17. Write short notes on any **two** of the following : 5+5
(a) Function based metrics
(b) Personal and Team process modules
(c) Architectural patterns.
-

REFERENCE 4

Code No. 11271

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Main Examination

April / May 2007

PROBABILITY AND RANDOM PROCESSES

Time : 3 Hours]

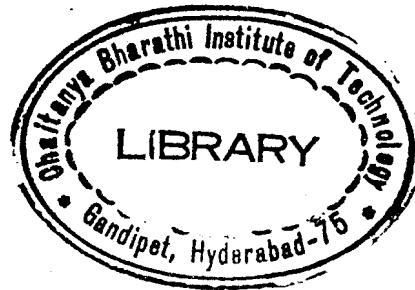
[Max. Marks : 75

- Note : 1) Answer all questions of Part A.
2) Answer five questions from Part B.

Part - A

Marks 25

1. Give the Axiomatic definition of probability. 2
2. For arbitrary events A_1, A_2, \dots , show that $P(\bigcup_k A_k) \leq \sum_k P(A_k)$. 3
3. Explain exponential distribution. 2
4. A coin is tossed 1000 times. Find the probability P_a that heads will show 500 times and the probability P_b that heads will show 510 times. 3
5. Explain Chebyshev inequality. 2
6. State the central limit theorem. 2
7. Explain strict sense stationery and wide sense stationery processes. 3
8. If the input to a linear system is white noise with autocorrelation :
 $R_{xx}(t_1, t_2) = q(t_1) \cdot \delta(t_1 - t_2)$, then show that
$$E\{|y(t)|^2\} = q(t) * |h(t)|^2 = \int_{-\infty}^{\infty} q(t - \alpha) |h(\alpha)|^2 d\alpha.$$
 3
9. Define Gavsian Process. 3
10. Explain White Noise. 2



(This paper is of 2 pages)

(Turn over)

Part - B

5 × 10 = 50

11. a) State and prove Bayes Theorem. 5
- b) A biased coin is tossed till a head appears for the first time. What is the probability that the number of required tosses is odd? 5
12. A box contains m white balls and n black balls. Balls are drawn at random one at a time without replacement. Find the probability of encountering a white ball by the K^{th} draw. 10
13. a) An order of 3000 parts is received. The probability that a part is defective equals 10^{-3} . Find the probability $P\{K > 5\}$ that there will be more than five defective parts. 5
- b) The probability of hitting an Aircraft is 0.001 for each shot. How many shots should be fired so that the probability of hitting with two or more shots is above 0.95? 5
14. A person writes m letters and addresses n envelopes. If one letter is randomly placed into each envelope, what is the probability that at least one letter will reach its correct destination? 10
15. Define Semi random telegraph signal process and random telegraph signal process and prove that the first one is evolutionary and the latter one is wide sense stationary. 10
16. a) Prove that a process $X(t)$ is Mean Square Periodic if its auto correlation is doubly periodic. 5
- b) State the properties of cross correlation. 5
17. a) If $Y(t) = A \cos(W_0 t + \theta) + N(t)$ where A is a constant, θ is a random variable with uniform distribution in $(-\pi, \pi)$ and $N(t)$ is a band limited Gaussian White Noise with power spectral density:
- $$S_{NN}(W) = \frac{N_0}{2} |W - W_0| < W_B$$
- 0, otherwise.
- find the Porter spectral density of $Y(t)$. 6
- b) Explain: i) Band Pass Process. 4
- ii) Coloured Noise.

Time : 3 Ho

Note : 1) A
2) A

1. Convert t
- a) $(a +$
- b) $(a' +$
2. State DeM
3. Realize be
4. Write the
5. Explain ga
6. What is ar
7. List variou
8. What is cl
9. What are h
10. What is Me
11. a) Explain

(This paper is c

3

Code No. 11272

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Main Examination

April / May 2007

DIGITAL LOGIC DESIGN

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks 25

1. Convert the following expressions into SOP form :
 - a) $(a + b')(b + c)$
 - b) $(a' + b)(b + c)$
2. State DeMorgan's Laws.
3. Realize basic gates with NAND gates only.
4. Write the character equation of RS flip-flop.
5. Explain gated arrays.
6. What is an encoder ?
7. List various types of counters.
8. What is clock synchronization ?
9. What are hazards ?
10. What is Mealy State Model ?

Part - B

5 × 10 = 50

11. a) Explain the operation of CMOS NOR gate with a diagram.

(This paper is of 2 pages)

(Turn over)

- b) Use algebraic manipulation to show that for three input variables X_1, X_2 and X_3 .

$$\sum m(0, 1, 2, 3, 4, 5, 6) = x_1 + X_2 + x_3.$$

12. Minimize the following expression using K-map into SOP and POS forms. Realize them with NAND gates only and NOR gates only.

$$F(a, b, c, d) = \sum m(0, 2, 8, 9, 10, 15) + D(1, 3, 6, 7).$$

13. a) Write VHDL code to simulate 4×1 multiplier.

- b) Show that the function $f(a, b, c) = \sum m(0, 2, 3, 4, 5, 7)$ can be implemented using a 3-to-8 binary decoder and an OR gate.

14. a) Draw the circuit of JK Flip-flop and explain.

- b) Design a mod-10 counter using T-Flip-flops.

15. Design a circuit that realizes the FSM defined by the state-assigned table using JK flip-flops.

Present State	Next State		Output
	W = 0	W = 1	
Y_2Y_1	Y_2Y_1	Y_2Y_1	z
00	10	11	0
01	01	00	0
10	11	00	0
11	10	01	0

16. Analyze the master-slave D flip-flop by giving circuit diagram, excitation table, flow tables and state diagram.

17. Write short notes on the following :

- Implementation of CPLDs.
- Mealy state mode.
- Testing sequential circuits.

Time : 3 Ho

Note : 1) A
2) A
3) A

- What is
- List and work.
- Describe
- Define i
- Describe
- Contrast
- Define l
- What is
- Define j
- For a m positive modulat

(This paper

5
Code No. 11273

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Main Examination

April / May 2007

ELECTRONIC COMMUNICATION TECHNIQUES

Time : 3 Hours]

[Max. Marks : 75

- Note :** 1) Answer **all** questions of Part A.
2) Answer any **five** questions from Part B.
3) Assume any data if necessary.

Part - A

Marks 25

1. What is meant by the terms Noise Factor and Noise Figure ? 3
2. List and describe the four requirements of a Feed Back Oscillator to work. 2
3. Describe three-point tracking. 2
4. Define input impedance for a transmission line. 2
5. Describe refraction. Explain Snell's Law of Refraction. 3
6. Contrast Asynchronous and Synchronous Satellites. 3
7. Define Kepler's Laws. 3
8. What is wave-guide ? 2
9. Define pre-emphasis and de-emphasis. 3
10. For a maximum possible envelope voltage of +12V and a minimum positive envelope amplitude of +4V, determine the percent modulation. 2

(This paper is of 2 pages)

(Turn over)

Part - B

5 × 10 = 50

11. a) Explain the working of an SSB transmitter. 6
 b) Calculate the percentage savings in power if only one sideband transmission is used over the DSB-FC system at (i) 100% modulation, (ii) 50% modulation. 4
12. a) List advantage to FET RF amplifiers have over BJT RF amplifiers. 4
 b) Describe the operation of a FET push-pull balanced modulator. 6
13. a) Draw the block diagram of an Armstrong indirect FM transmitter and describe its operation. 7
 b) Compare FM to PM. 3
14. a) Draw the schematic diagram of a quadrature FM demodulator and describe its operation. 6
 b) What is meant by TE and TM mode of propagation? 4
15. Define diversity. Describe the three most commonly used diversity schemes. 10
16. For a two-tone test signal of 1.5 kHz and 3 kHz and a carrier frequency of 100 kHz, determine for a single side-band suppressed carrier transmission.
 a) Output frequency spectrum if only the upper sideband is transmitted. 10
 b) For $E_1 = E_2 = 5 V_p$ and a load resistance of 50Ω , find the average out put power.
7. Write short notes on :
 a) Circular Wave guides. 2
 b) Elementary doublet. 3
 c) Parabolic Antenna. 3
 d) Yagi-Uda Antenna. 2

F A C

B.E. 2/4

Time : 3 Hours]

Note : 1) Answer all
 2) Answer any

1. What is Antialiasing
2. What is a view port?
3. What are the bending
4. What are Scanline Mo
5. Explain the paramet
6. Explain the advantage
7. Define fill area primiti
8. What is half tone?
9. Write the 3D transform
10. What is diffuse reflecti
11. a) Describe DDA Algori
 b) Explain the characte

(This paper is of 2 pages)

7

Code No. 11274

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Main Examination

April / May 2007

COMPUTER GRAPHICS

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks : $10 \times 2.5 = 25$

1. What is Antialiasing ?
2. What is a view port ?
3. What are the bending functions for B-splines ?
4. What are Scanline Methods ?
5. Explain the parametric representation of a surface.
6. Explain the advantages of raster scan display over DVST.
7. Define fill area primitive.
8. What is half tone ?
9. Write the 3D transformation of motion.
10. What is diffuse reflection ?

Part - B

$5 \times 10 = 50$

11. a) Describe DDA Algorithm for line generation.
b) Explain the character generation methods.

(This paper is of 2 pages)

(Turn over)

12. a) What is meant by homogeneous representation of transformation matrices ? Why it is necessary ?
b) List the homogenous representation of all the basic transformation.
13. a) Describe the depth buffer method for hidden line removal.
b) Write short notes on viewing pipeline.
14. a) Discuss the steps involved in the ordered edge list algorithm.
b) What are the advantages of edge flag algorithm ?
15. a) List any three motion specifications. Explain.
b) Explain any four properties of spline and curve.
16. a) Briefly explain about different image compression techniques.
b) Explain the steps involved in simple parity scan conversion algorithm.
17. a) What is the utility of segments ? Explain the use of segment table for organizing information about the segments.
b) What are the various data structures that are used for storing segments ? Comment on their relative merits and demerits.
-

F A C U

B.E. 2/4

COMPUTER C

Time : 3 Hours]

Note : 1) Answer all q
2) Answer any 1

1. Explain the basic fu
2. Explain Data Repres
3. Explain Stack Opera
4. Explain execution of
5. Explain 8085 flags.
6. What is I/O interface
7. List data transfer met
8. What is 8085 Interrup
9. Explain Virtual Memc
10. What is pipelining ?
11. Explain Microprogram
12. Explain the instruction
13. Explain interrupt hand

(This paper is of 2 pages)

9
Code No. 11275

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Main Examination

April / May 2007

COMPUTER ORGANIZATION AND MICROPROCESSORS

Time : 3 Hours]

[Max. Marks : 75

- Note :** 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks 25

1. Explain the basic functional units of a computer system. 2
2. Explain Data Representation. 2
3. Explain Stack Operations. 3
4. Explain execution of an instruction. 3
5. Explain 8085 flags. 3
6. What is I/O interface ? 2
7. List data transfer methods. 2
8. What is 8085 Interrupts ? 3
9. Explain Virtual Memory. 3
10. What is pipelining ? 2

Part - B

5 × 10 = 50

11. Explain Microprogrammed Control Unit in detail.
12. Explain the instruction set of 8085 in brief.
13. Explain interrupt handling in detail.

(This paper is of 2 pages)

(Turn over)

14. Explain On-line storage devices.
 15. Explain 8257 programmable DMA Controller.
 16. Explain Static and Dynamic RAMs and their characteristics.
 17. Write short notes on the following :
 - a) Addressing modes.
 - b) 8085 opcode fetch cycle.
 - c) Multiple execution paths.
-

F

B.E

Time : 3 Hours]

Note : 1) Answer
2) Answer

1. How are views
2. Define Candid
3. What is Relati
4. What is Data I
5. What is Functi
6. What is Multip
7. What is Serializ
8. What is Deadloc
9. What is Parallel
10. What is transpa
11. a) What is Data
b) Discuss about

(This paper is of 2 pa,

11

Code No. 11276

FACULTY OF ENGINEERING
B.E. 2/4 (IT) II Semester Main Examination

April / May 2007

DATA BASE SYSTEMS

Time : 3 Hours]

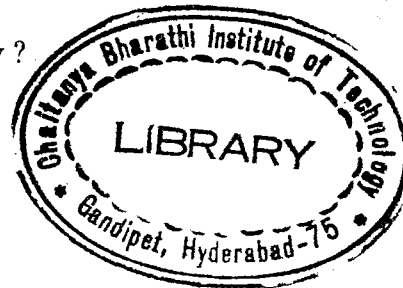
[Max. Marks : 75

- Note : 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks 25

1. How are views created in SQL ? 2
2. Define Candidate Key. 2
3. What is Relation ? 2
4. What is Data Dictionary ? 2
5. What is Functional Dependency ? 3
6. What is Multiple-key Access ? 3
7. What is Serializability ? 3
8. What is Deadlock State ? 3
9. What is Parallel System ? 3
10. What is transparency ? 2



Part - B

5 × 10 = 50

11. a) What is Data Model ? Explain its types. 5
- b) Discuss about Relational Columns. 5

(This paper is of 2 pages)

(Turn over)

12. a) What is a Trigger ? Explain. 5
b) Explain about 4NF. 5
13. a) Explain about Query Processing. 5
b) Describe about 'Extendible Hashing'. 5
14. a) Explain Time Stay based protocol. 5
b) What is meant by Shadow Paging ? 5
15. a) Explain about Intra Query Parallelism. 5
b) What is the functionality of 'Semi-Join Strategy' ? 5
16. Explain the following : 3+3+4
a) Referential Integrity.
b) Sparse Indices.
c) ACID properties.
17. Write short notes on any two of the following : 10
a) Types of locking.
b) Types of failures that may occur in database environment.
c) Parallel databases.
-

Code No. 4251

FACULTY OF INFORMATICS
B.E. 2/4 (IT) II Semester Supplementary Examination

November / December 2007

PROBABILITY AND RANDOM PROCESSES

Time : 3 Hours]

[Max. Marks : 75

- Note :** 1) Answer **all** questions of Part A.
2) Answer any **five** questions from Part B.

Part - A

Marks 25

1. Show that area under normal curve is unity. 2
2. Show that for any two events A and B , $P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B)$. 3
3. Define probability density function of a r.v. in discrete and continuous cases. 2
4. The final pdf of the r.v. X and Y is $f_{XY}(x, y) = Ae^{-(x+y)}$, $x \geq 0$, $y \geq 0$. Find the constant at A . 3
5. Write the properties of characteristic function of a r.v. 2
6. What is generalised form of Bienayme-Chebychev inequality? 3
7. Write a note on Stochastic Process. 2
8. What is first-order stationary process? 3
9. What is Causal and Non-Causal Systems 3
10. Find the variance of a r.v.y. which is uniformly distributed between 0 and 10. 2

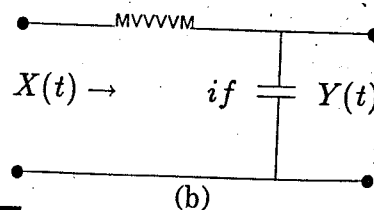
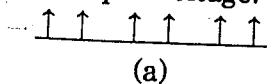
(This paper is of 2 pages)

(Turn over)

Part - B

5 × 10 = 50

11. a) State and prove addition theorem of probability for n events. 5
 b) The probability of the closing of each relay of the circuit is given to be α . Assuming that all relays act independently. What is the probability of a current existing between terminals A and B ? 5
12. Joint distribution of X and Y is given by 10
 $f_{XY}(x, y) = 4xye^{-(x^2+y^2)}; x \geq 0, y \geq 0$.
 i) Test whether X and Y are independent.
 ii) For the above joint distribution, find the conditional density X given, $Y = y$ and Y given $X = x$.
13. In a lottery, m tickets are drawn at a time out of n tickets numbered 1 to n . Find the expectation and the variance of the sum S of the members of the tickets drawn. 10
14. a) What is an ergodic process? Explain. 5
 b) How does ensemble average differ from time average in stochastic process? 5
15. a) Give the autocorrelation function for a stationary process is $R_{XX}(\tau) = 25 + \frac{4}{1+6\tau^2}$. Find the mean and variance of the process $X(\tau)$ 5
 b) Given a stationary random process $X(t) = 10 \cos[100t + \theta]$ where θ is a r.v. with a uniform probability distribution in the interval $-\pi, \pi$. Show that $X(t)$ is ergodic in the autocorrelation function. 5
16. What is Gaussian Process? Explain. 10
17. A random voltage signal in the form of poisson-distributed unit impulses Fig. (a) is applied at the input terminals of an RC circuit shown in Fig. (b). Determine the psd, auto correlation function of the output voltage. Also determine the mean value and mean square value of the output voltage. 10

F
B.E. 2/4

Time : 3 Hours

Note : 1) Ansu
2) Ansu

1. Prove that :
2. Show how a
3. Give the NM
4. Distinguish i
5. What is an e
6. Give the tru
7. What is a Se
8. Write the VI
9. Give the step
10. Explain Path

11. a) Find the
 $f = x_1 \bar{x}_2 \hat{\sigma}$

b) Explain d

(This paper is of 2

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Supplementary Examination

November / December 2007

DIGITAL LOGIC DESIGN

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks 25

- 1. Prove that x + yz = (x + y)(x + z).
2. Show how an ex-or gate can be used as NOT gate.
3. Give the NMOS realization of NAND gate.
4. Distinguish implicant and prime implicant.
5. What is an encoder ?
6. Give the truth table for SR Latch.
7. What is a Sequential Circuit ?
8. Write the VHDL Code for Half-adder.
9. Give the steps in Synthesis Process.
10. Explain Path Sensitizing.

Part - B

5 x 10 = 50

- 11. a) Find the minimal SOP expression for f = x1x2x3 + x1x2x4 + x1x2x3x.
b) Explain design of logic circuits with PLA'S.

(This paper is of 2 pages)

(Turn over)

5 x 10 = 50

events. 5

circuit is given

What is the

and B ? 5

10

density X

s numbered

m S of the

10

5

n stochastic

5

process is

nce of the

5

+ theta] where

ion in the

correlation

5

10

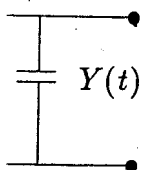
outed unit

RC circuit

unction of

an square

10



12. Find the minimal SOP and POS expressions for the function by K-map: 10

$$f(x_1x_2x_3x_4) = \sum (0, 2, 8, 9, 10, 15) \\ +d(1, 3, 6)$$

13. a) Design a 4×1 multiplexer and explain. 5

b) Write VHDL Code for 4×1 Mux. 5

14. a) Design a 4-bit up counter using T-Flip Flops. 7

b) Explain gate D latch. 3

15. Derive a circuit that realizes the FSM defined by the state-assigned table using JK flip flops. 10

Present State y_2y_1	Next State		Output z
	$w = 0$	$w = 1$	
	Y_2Y_1	Y_2Y_1	
0 0	1 0	1 1	0
0 1	0 1	0 0	0
1 0	1 1	0 0	0
1 1	1 0	0 1	

16. Derive the excitation table, flow table and flow table with unspecified entities for master-slave D flip flop. 10

17. Explain the following : 10

a) Hazards.

b) Fault Model.

F A C

B.E. 2/4 (IT

ELECT

Time : 3 Hours]

Note : 1) Answer e

2) Answer a

3) Assume c

1. List and describe communications

2. What is the relationship between bandwidth in a c

3. What is a Pilot C

4. Define characteri

5. Define Maximum

6. List characteristic

7. Define the follow feeder loss.

8. Draw the equivale

9. Explain about enc

10. For a transmission voltage $E_r = 3 V$.

(This paper is of 2 pag

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Supplementary Examination

November / December 2007

ELECTRONIC COMMUNICATION TECHNIQUES

Time : 3 Hours]

[Max. Marks : 75

- Note:** 1) Answer all questions of Part A.
 2) Answer any five questions from Part B.
 3) Assume any data if missing.

Part - A

Marks 25

1. List and describe two reasons why modulation is necessary in electronic communications ? 3
2. What is the relationship between the modulating-signal frequency and bandwidth in a conventional AM system ? 2
3. What is a Pilot Carrier ? 2
4. Define characteristic impedance of a transmission line. 2
5. Define Maximum usable frequency. 2
6. List characteristics that are desirable in an RF amplifier. 3
7. Define the following terms : free-space path loss, branching loss and feeder loss. 3
8. Draw the equivalent circuit of a transmission line. 2
9. Explain about end-fire array broadside array. 3
10. For a transmission line with incident voltage $E_i = 5$ V and reflected voltage $E_r = 3$ V. Determine Reflection Coefficient. 3

(This paper is of 2 pages)

(Turn over)

Part - B

5 × 10 = 50

F A

B.E. 2/4 (I

11. a) For a receiver with IF, RF and local oscillator frequencies of 455 kHz, 1100 kHz and 1555 kHz respectively, determine : 5
- Image frequency
 - Image frequency rejection ratio for preselector $Q = 100$.
 - Image frequency rejection ratio for a $Q = 50$.
- b) Explain about Low-level AM DSBFC transmitted with block diagram. 5
12. a) Explain the operation of Voltage Controlled Oscillator. 7
- b) What are the advantages of using linear-integrated circuit modulators for AM ? 3
13. a) Describe the basic operation of a reactance FM Modulator. 5
- b) For an FM modulator with an unmodulated carrier amplitude $V_c = 20$ V, a modulation index $m = 1$ and a load resistance $R_L = 10\Omega$, determine the power in the modulated carrier and each side frequency and sketch the power spectrum for the modulated wave. 5
14. a) Draw the schematic diagram for a Foster-seeley discriminator and describe its operation. 7
- b) Discuss reflection coefficient and input impedance of a transmission line. 3
15. a) Describe the Optical Properties of Radio Waves in detail. 6
- b) For a carrier frequency of 6 GHz and a distance of 50 km, determine the free-space path loss. 4
16. For a rectangular wave guide with wall separation of 2.5 cm, desired frequency of operation of 7 GHz, determine : 10
- Cut-off frequency.
 - Cut-off wave length.
 - Group Velocity.
 - Phase velocity.
17. Write short notes on :
- Orbital satellites and Geo stationary satellites. 5
 - FM microwave Radio Transmitter. 5

Time : 3 Hours]

Note : 1) Answer :
2) Answer :

- Explain briefly I
- What is meant b
- What are the bas
- Define the term
- Define Clipping.
- Define View Post
- What is meant by
- Mention names of and GKS.
- What is meant by
- What is meant by
- a) Discuss DDA a (1,1) and (7,6
- b) Explain display

(This paper is of 2 page.

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Supplementary Examination

November / December 2007

COMPUTER GRAPHICS

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer all questions of Part A.

2) Answer any five questions from Part B.

Part - A

Marks 25

1. Explain briefly Digitizer ?
2. What is meant by Random Scan System ?
3. What are the basic attributes of a straight line.
4. Define the term Transformation.
5. Define Clipping.
6. Define View Post.
7. What is meant by local coordinates ?
8. Mention names of any four logical device classifications used by PHIGS and GKS.
9. What is meant by Octsee ?
10. What is meant by Z-buffer method ?

Part - B

5 × 10 = 50

11. a) Discuss DDA algorithm and trace for drawing the line between (1,1) and (7,6).
- b) Explain display devices in detail.

(This paper is of 2 pages)

(Turn over)

12. a) Explain in detail about Area-Fill Attributes.
- b) Construct a 2-D transformation matrix in homogeneous coordinates for the given sequence :
- Rotation around the origin by 75° .
 - Translation by $(-3, 5)$.
13. a) Explain Liang-Barsky line clipping algorithm.
- b) Describe the window-to-viewport co-ordinate transformation.
14. a) Explain in detail Editing-Structures.
- b) Write about Interactive Picture Construction Techniques.
15. a) Discuss about Quadratic Surfaces.
- b) Explain about B-spline curves.
16. a) Using origin as center of projection, derive the perspective transformation on the plane passing through the point $R_0(x_0, y_0, z_0)$ and having the normal vector $\vec{N} = n_1\vec{i} + n_2\vec{j} + n_3\vec{k}$.
- b) Write the procedure of transformation from World to Viewing Coordinates.
17. Write short notes on :
- BSP tree methods.
 - Character Attributes.
 - Graphics Work Station.

F A C

B.E. 2/4 (IT)

COMPUTER

[Time : 3 Hours]

Note : 1) Answer all
2) Answer any

- . What are the functions of a computer?
- . Explain the methods of data representation.
- . What is Instruction set?
- . Explain Hardwired control.
- . Explain the address bus.
- . Explain memory in a computer.
- . Explain Virtual Memory.
- . What is Locality of reference?
- . Explain USART.
- 0. What is data dependency?
- 1. a) Discuss the structure of a computer system.
b) Explain the Stack.

This paper is of 2 pages)

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Supplementary Examination

November / December 2007

COMPUTER ORGANIZATION AND MICRO PROCESSORS

Time : 3 Hours]

[Max. Marks : 75

- Note : 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks 25

- | | |
|--|---|
| What are the functions of a computer ? | 2 |
| Explain the methods to represent real numbers. | 3 |
| What is Instruction Cycle ? | 3 |
| Explain Hardwired Control Unit. | 3 |
| Explain the addressing of I/O devices. | 3 |
| Explain memory interfacing. | 2 |
| Explain Virtual Memory. | 2 |
| What is Locality of Reference ? Explain. | 2 |
| Explain USART. | 3 |
| What is data dependency ? Explain. | 2 |

Part - B

5 × 10 = 50

- Discuss the structure of the system bus.
- Explain the Stack organization in detail.

This paper is of 2 pages)

(Turn over)

12. a) Discuss the Microprogrammed Control Unit in detail.
b) What is Instruction Cycle ? Explain.
13. Discuss the Direct Memory Access (DMA) in detail.
14. a) Explain the programming of 8255A.
b) Explain Stepper Motor Interfaces.
15. a) Explain the mapping functions of Cache Memory.
b) What is Instruction Queue ? Explain.
16. a) Explain the addressing modes of 8085.
b) List the instruction set of 8085.
17. Write short notes on the following :
- a) Addressing Modes.
 - b) Subroutines.
 - c) Interrupts.

B.E. 2/

Time : 3 Hours

Note : 1) Ansu
2) Ansu

1. What are W
2. What is Non
3. Explain BCN
4. What is Seria
5. What are the
6. What is Data
7. What is a Dat
8. What is Funct
9. What is Concu
10. Explain Joins.
11. Discuss about t
12. Explain BCNF
3NF.

(This paper is of 2 p

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II Semester Supplementary Examination

November / December 2007

DATABASE SYSTEMS

Time : 3 Hours]

[Max. Marks : 75

- Note :** 1) Answer all questions of Part A.
2) Answer any five questions from Part B.

Part - A

Marks 25

- | | |
|--|---|
| 1. What are Weak Entities ? | 2 |
| 2. What is Non-loss Decomposition ? | 2 |
| 3. Explain BCNF. | 3 |
| 4. What is Serializability ? | 3 |
| 5. What are the various levels of Data Abstraction ? | 3 |
| 6. What is Data Server? | 2 |
| 7. What is a Database Recovery ? | 3 |
| 8. What is Functional Dependency ? | 3 |
| 9. What is Concurrency ? | 2 |
| 10. Explain Joins. | 2 |

Part - B

5 × 10 = 50

- | | |
|---|----|
| 11. Discuss about the operations of Relational Algebra with examples. | 10 |
| 12. Explain BCNF and show that if a relation is in BCNF, then it is in 3NF. | 10 |

(This paper is of 2 pages)

(Turn over)

13. Write procedure for inserting and deleting elements into a B+ TREE. 10
14. a) Describe the basic time stamp ordering protocol for concurrency control. 5
- b) How Thomas Write Rule effects the basic time stamp ordering protocol ? 5
15. a) Explain Client-Server Architecture. 5
- b) Explain about Log-based Recovery. 5
16. a) Discuss the types of failures that may occur in a database environment. 5
- b) Describe about Inter Query parallelism. 5
17. Write short notes on **two** of the following : 10
- a) Homogeneous Distributed Databases.
- b) Shadow Paging.
- c) Triggers.
-

REFERENCE

Code No.: 10066

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April 2006

PROBABILITY AND RANDOM PROCESSES

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A and any **five** questions from Part B.

Part A – (Marks : 25)

1. If A and B are independent, then show that \bar{A} and B are also independent. 2
2. Show that $2^n - (n + 1)$ equations are needed to establish the mutual independence of n events. 3
3. If $P(A) = 0.35$, $P(B) = 0.75$ and $P(A \cup B) = 0.95$ find $P(\bar{A} \cup \bar{B})$. 2
4. A and B toss a fair coin alternatively with the understanding that the one who obtains the head first wins. If A starts what is his chance of winning. 3
5. State the properties of joint probability distribution. 2
6. State the central limit theorem. 2
7. When are two random processes said to be orthogonal? 2
8. Distinguish between discrete random process and continuous random process. 3
9. Define Gaussian process. 3
10. Define noise and filter. 3

Part B – (Marks : $5 \times 10 = 50$)

11. (a) In a binary communication system a '0' or '1' is transmitted. Because of noise in the system a '0' can be received as a '1' with probability ' p ' and a '1' can be received as a '0' also with probability ' p '. Assuming that the probability that a '0' is transmitted is p_0 and a '1' is transmitted is q_0 , find that a '1' was transmitted when a '1' is received. 7
- (b) A dice is rolled and if the odd number is selected, what is the probability that the number is prime. 3

[P.T.O.]

12. If x and y are two continuous random variables and their joint probability density function is

16

$$f(x, y) = 4xy e^{-(x^2+y^2)}, x \geq 0, y \geq 0$$

$$= 0 \text{ otherwise}$$

- Find (a) Marginal density function of x
 (b) Marginal density function of y
 (c) Check x and y are independent or not
 (d) $\text{var}(y)$.

17

13. (a) Find the characteristic function of the

$$\text{distribution } f(x) = \frac{\lambda^n}{\Gamma n} (\lambda > 0 \text{ and } n \text{ is positive})$$

and derive mean and variance of x .

5

- (b) A random variable x is uniformly distributed over $(-\sqrt{3}, \sqrt{3})$. Compute $P\left\{|X - M| \geq \frac{3\pi}{2}\right\}$ and compare it with the upper bound by Chebyshev's inequality.

5

14. Define semi-random telegraph signal process and random telegraph signal process and prove that the former is evolutionary and latter is wide sense stationary.

10

15. (a) Show that the process $X(t) = A \cos \lambda t + B \sin \lambda t$ (where A and B are random variables) is wide sense stationary.

5

- (b) Prove that the random process $X(t)$ whose probability distribution is

$$P(x) = \frac{(at)^{n+1}}{(1+at)^{n+1}} \text{ for } n = 1, 2, \dots \text{ and}$$

$$= \frac{at}{(1+at)} \text{ for } n = 0$$

is not stationary.

5

16. (a) If $Y(t) = A \cos(\omega_0 t + \theta) + N(t)$ where A is a constant, θ is a random variable with uniform distribution in $(-\pi, \pi)$ and $N(t)$ is a band limited Gaussian white noise

$$\text{with power spectral density } S_{NN}(\omega) = \frac{N_0}{2} \quad |\omega - \omega_0| < \omega_B$$

$$= 0 \text{ otherwise}$$

find the power spectral density of $Y(t)$.

7

- (b) State the properties of cross correlation.

3

17. (a) Derive mean and variance of the density function

$$f(x) = \frac{1}{\sqrt{2\pi}\sigma} \cdot e^{-\frac{1}{2}\left(\frac{x-M}{\sigma}\right)^2}, \quad -\infty < x < +\infty.$$

5

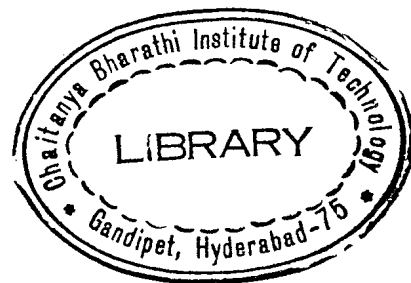
- (b) The joint density of the random variables X and Y is given by

$$f(x, y) = 8xy \quad 0 < x < 1, \quad 0 < y < x$$

$$= 0 \text{ elsewhere}$$

$$\text{find } p\left[y < \frac{1}{8} \mid x < \frac{1}{2}\right].$$

5



FACULTY OF INFORMATICS
B.E. II/IV Year (IT) II Semester (Main) Examination, April 2006
DIGITAL LOGIC DESIGN

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A.
 Answer **five** questions from Part B.

Part A – (Marks: 25)

- | | |
|---|---|
| 1. Convert the following expression into pos form. | 2 |
| (a) $\overline{A}B + B\overline{C}$ (b) $\overline{w}y + \overline{x} \overline{y} + wxz$. | |
| 2. Distinguish between PLA and PAL. | 2 |
| 3. Define Noise immunity and Fan out of a logic circuit. | 3 |
| 4. Define Static and Dynamic Hazards. | 2 |
| 5. Write the characteristic equation of JKFF. | 2 |
| 6. Define configurable Logic Block. | 3 |
| 7. Distinguish between functions and procedures in VHDL. | 3 |
| 8. Draw the JK Master-Slave Flip Flop with only NAND gates. | 3 |
| 9. Differentiate the Moore and Mealey Machines. | 2 |
| 10. Write the VHDL code for 1 bit comparator. | 3 |

Part B – (Marks: 5 × 10 = 50)

- | | |
|---|---|
| 11. (a) Explain the operation of CMOS NAND gate with a neat diagram. | 6 |
| (b) Write the DeMorgan's laws and prove them. | 4 |
| 12. (a) Minimise the following expression using K-Map
$\Sigma m(5, 6, 9, 10, 12, 13, 14, 15) + d(2,4)$. | 5 |
| (b) Explain the procedure for the testing of a combinational circuit. | 5 |

[P.T.O.]

- | | | |
|--|----|------|
| 13. (a) Write a VHDL code to simulate a full adder. | 5 | |
| (b) Draw the CMOS PLD circuit and explain its operation. | 5 | |
| 14. Draw the FPGA (xilinx) chip architecture and explain its working. | 10 | Time |
| 15. (a) Draw the state table, state diagram of RS FF. | 5 | |
| (b) Design a 4 bit ripple counter using DFF. | 5 | |
| 16. (a) Explain the functional decomposition of a logic circuit. | 5 | |
| (b) Draw a 2×1 MUX using transmission gates and explain its working. | 5 | 1. A |
| 17. (a) What are the different clock synchronization methods and explain them. | 5 | i |
| (b) What is the importance of Test Vectors in VHDL simulation? | 5 | 2. A |

1. A

R

i

2. A

t

f

3. V

t

4. C

5.

6.

7.

8.

9.

10.

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April 2006

ELECTRONIC COMMUNICATION TECHNIQUES

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A and answer **five** questions from Part B.

Assume any missing data suitably.

Part A - (Marks : 25)

1. An AM transmitter is modulated by two sine waves, at 1kHz and 2.5 kHz, with a modulation due to each of 25% and 50% respectively. What is the effective modulation index?
2. An AM signal has the equation :

$$v(t) = (15 + 4 \sin 44 \times 10^3 t) \sin (46.5 \times 10^6 t) \text{ volts.}$$
 find (a) the carrier frequency
 (b) the frequency of the modulating signal
 (c) the value of modulation index.
3. What is pre-emphasis and how is it used to improve the signal to noise ratio of FM transmissions?
4. Compare the effects of modulation on the carrier power and the total signal power in FM and AM.
5. Explain the difference between balanced and unbalanced lines, and give an example of each.
6. Determine the characteristic impedance of a two conductor balanced transmission line having 2 cm spacing between the conductors, and 0.5 cm as diameter of the conductors.
7. Find the characteristic impedance of glass with a relative permittivity of 7.8. Also find the propagation velocity of radio waves in glass.
8. Explain the need for antenna array and also their classification.
9. Two points 50 km apart on earth can communicate using direct radio link, with a LEO satellite at an altitude of 500 km. Calculate the two-way time delay when satellite is directly located over the center of the earth.
10. State Kepler's laws.

[P.T.O.]

Part B – (Marks : $5 \times 10 = 50$)

11. Enumerate the drawback of AM DSB FC scheme. Explain the generation of SSB signal.
12. Draw the block diagram of the Armstrong FM system and explain the generation of FM signals.
13. Draw the block diagram of a basic PLL system and explain its ability to track the frequency changes in the input signal. What are meant by 'lock range' and 'capture range'?
14. (a) Parabolic reflector antenna is widely used for microwave radio communication. Justify.
- (b) A parabolic reflector has an aperture efficiency of 0.55 and a directivity of 30 dB at 300 MHz. Calculate the diameter and half power beamwidth.
15. (a) List out the satellite subsystems.
- (b) Calculate the antenna beam angle required by a satellite antenna to provide full global coverage from a geostationary orbit.
16. An X-band rectangular waveguide filled with a dielectric ($\epsilon_r = 2.56$) is operating at 9.5 GHz. Calculate group and phase velocities. Also calculate TE and TM wave impedances.
17. Write short notes on :
- (a) Inverse square law
- (b) FM stereo broadcasting.

Time

1. W

2. W

3. W

4. W

5. W

6. W

7. W

8. W

9. W

10. W

11. (a)

(b)

12. (a)

(b)

13. (a)

(b)

14. (a)

(b)

68

Code No. 10069

SB

FACULTY OF INFORMATICS
B.E. II/IV Year (IT) II Semester (Main) Examination, April 2006

COMPUTER GRAPHICS

a of

Time : 3 Hours]

[Max. Marks : 75

the
ure

Answer **all** questions of Part A.
Answer **five** questions from Part B.

Part A – (Marks: 25)

on.

dB

full

at
ave

1. What is antialiasing?
2. What are homogeneous coordinates?
3. What is hierarchical modeling?
4. What is a view port?
5. What is back face detection?
6. What is polygon inside test?
7. What is a frame buffer?
8. What are the blending functions for B-splines?
9. What is diffuse reflection?
10. What is an octree?

Part B – (Marks: 5 × 10 = 50)

11. (a) Describe the Bresenham's line drawing algorithm for all quadrants.
(b) What are the differences between the raster scan and random scan devices?
12. (a) Describe the matrix forms of the two dimensional transformations of translation, rotation and scaling.
(b) Find the matrix transformation for finding the reflection of a point with respect to the line given by the equation $2x + 3y + 4 = 0$.
13. (a) What is viewing transformation? Explain.
(b) Describe the Sutherland - Hodgman algorithm for polygon clipping.
14. (a) What is hierarchical modeling? How is it achieved?
(b) How do you classify input devices? Differentiate different classes of devices.

[P.T.O.]

15. (a) Discuss how curves and surfaces are modeled using Bezier curves.
(b) Write short notes on fractal geometry methods.
16. (a) Describe the Depth buffer method for hidden line removal.
(b) What are scanline methods? How are they useful in visible surface detection?
17. Write short notes on :
- (a) Basic illumination models.
 - (b) Gouraud shading
 - (c) Viewing pipeline.
-

10069

Code No.: 10070

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April 2006

COMPUTER ORGANIZATION AND MICROPROCESSORS

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part A.
Answer **five** questions from Part B.

Part A – (Marks : 25)

1. Explain basic functional units of computer. 3
2. Explain methods to represent characters. 2
3. Explain steps involved for execution of an instruction. 3
4. List the advantages of Hardwired control unit. 3
5. Distinguish between memory mapped I/O and I/O mapped I/O. 3
6. What is DMA? When it is used? 2
7. Explain the concept of virtual memory. 2
8. Distinguish between synchronous and asynchronous data transfer. 2
9. What are the functions of USART? 2
10. Explain data dependency. 3

Part B – (Marks: 5 × 10 = 50)

11. (a) Explain stack and its operations in detail.
(b) Explain instruction sequencing.
12. Explain microprogrammed control unit in detail.
13. (a) What are the interrupts supported by 8085? How different interrupts differ?
(b) Discuss different data transfer schemes supported by 8085.
14. Explain the features of 8255 with a block diagram.
15. (a) Explain various types of memories.
(b) Discuss pipelining mechanism.

[P.T.O.]

16. Explain the internal architecture of 8085 with a block diagram.

17. Write short notes on the following :

- (a) HALT and HOLD states
- (b) Subroutines
- (c) Memory interfacing.



T

1
2
3
4
5
6
7
8
9

FACULTY OF INFORMATICS

B.E. II/IV Year (IT) II Semester (Main) Examination, April 2006

DATABASE SYSTEMS

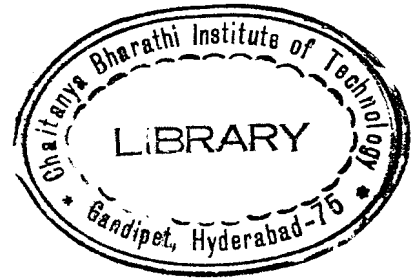
Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions from Part A and any **five** questions from Part B.

Part A - (Marks : 25)

1. What are weak entities?
2. What is client-server Architecture?
3. How are views created using SQL?
4. What is a functional dependency?
5. What is non-loss decomposition?
6. What are the various levels of data abstraction?
7. Explain 2NF.
8. What is serializability?
9. Define B+ tree of order m.
10. What are acid properties?

**Part B** - (Marks: 5 × 10 = 50)

11. (a) Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. A log has to be maintained for each patient of the various tests and examinations conducted and explain each of the entities.
(b) Convert the above E-R diagram into tables.
12. Create tables using SQL for the following relations defining proper data types and write queries for the following questions.
Suppliers (sid, sname, status, city)
Products (pid, pname, color, weight, city)
SP (sid, pid, qty)
(a) Get supplier numbers and status for suppliers in Paris, in descending order status.
(b) Get supplier numbers for suppliers in Paris with status > 20.

[P.T.O.]

13. (a) Write procedures for inserting and deleting elements into a B^+ tree.
(b) How does a B-tree differ from a B^+ - tree? Explain with an example.
 14. (a) Discuss the types of failures that may occur in a database environment.
(b) Describe the basic time stamp ordering protocol for concurrency control
Explain how Thomas Write rule effects the basic time stamp ordering protocol
 15. (a) Discuss query processing in distributed databases.
(b) Distinguish between distributed and parallel databases.
 16. (a) Discuss about all the operations of relational algebra with examples.
(b) Explain BCNF and show that if a relation is in BCNF then it is in 3NF.
 17. Write short notes on any **two** of the following:
 - (a) Aggregate operations with SQL.
 - (b) Data Dictionary.
 - (c) Advance recovery techniques.
-

FACULTY OF INFORMATICS
B.E. (IT) II Semester (Supplementary) Examination, December 2006

Subject : Probability & Random Processes

Time : 3 Hours]

REFERENCE

[Max. Marks : 75

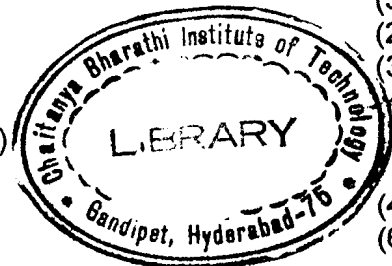
Note : Answer all questions of Part-A and answer any five questions from Part-B.

Part – A (25 Marks)

1. If A and B are mutually exclusive events, prove that $P(A|\bar{B}) = P(A) / 1 - P(B)$. (2)
2. The behaviour of a binary communication system modeled by the conditional probability $P(y = 1/x = 1) = 3/4$ and $P(y = 0/x = 0) = 7/8$, where the input random variable takes on one of the two values 0 to 1 with probability $3/4$ and $1/4$ respectively.
 - (i) Find $P(y = 1)$ and $p(y = 0)$
 - (ii) Find $P(x = 1/y = 1)$ (3)
3. Write the note on probability density function. (2)
4. A random process gives measurements x between 0 and 1 with a probability density function $f(x) = 12x^3 - 21x^2 + 10x$, $0 \leq x \leq 1$, $f(x) = 0$, elsewhere.
 - (i) find $P[x \leq 1/2]$ and $P(x > 1/2)$
 - (ii) find a number K such that $P[x \leq k] = 1/2$ (3)
5. Write a note on Random Vectors. (2)
6. What is characteristic function of a r.v. Give example. (3)
7. State Central Limit Theorem. (2)
8. Describe about "Covariance Functions". (3)
9. Write a note on Schwartz's inequality. (2)
10. Describe about "Characteristic Function". (3)

Part – B (50 Marks)

11. (a) State the axioms of probability. (4)
- (b) Write and explain "Baye's Theorem". (6)
12. (a) List and explain properties of Distribution Functions. (6)
- (b) Explain about "Poisson Points". (4)
13. State and prove inequalities of Chebychev and Schwartz. (10)
14. (a) Distinguish between random variable and random process. (4)
- (b) Write and explain "Weiner – Kinchine" Theorem. (6)
15. (a) Describe about "Gaussain Process". (5)
- (b) What is meant by "Ergodicity" ? Explain. (5)
16. What is low pass and band pass noise representation ? Explain. (10)
17. Write short notes on the following : (5+5)
 - (a) Spectral representation
 - (b) Convergence in Probability



FACULTY OF INFORMATICS

B.E. 2 / 4 (IT) II Semester (Supplementary) Examination, December 2006

Subject : Digital Logic Design

Time : 3 Hours}

REFERENCE {Max. Marks : 75

Note : Answer All questions of Part – A and Answer any five questions from Part-B

PART – A (25 Marks)

1. Compare programmable array logic with programmable logic array. (2)
2. Simplify the expression $Z = AB + A\bar{B}(\bar{A}C)$. (3)
3. Implement the following function using 8 : 1 multiplexer. (3)
 $F(A,B,C) = \sum m(2,5,7)$
4. Define the following terms in connection with logic gates. (2)
 (i) Fan-in (ii) Fan-out (iii) Propagation delay
 (iv) Speed power product (v) Noise margin
5. Compare a decoder with a demultiplexer. (2)
6. Define Minterm and Maxterm. (3)
7. Write the count sequence in a MOD – 16 down counts. (2)
8. Specify any 3 applications of shift register. (3)
9. Write a short notes on FPGAs. (2)
10. Draw the logic circuit of NMOS NAND gate and give the truth table. (3)

PART – B (50 Marks)

- 11.(a) Find the Canonical product of sums from for the function. (5)
 $f(x,y,z) = \bar{x}\bar{y}\bar{z} + \bar{x}\bar{y}z + \bar{x}yz + xyz + x\bar{y}\bar{z} + x\bar{y}z$
 (b) Reduce the following function using k map technique and implement using gates. (5)
 $F(A,B,C,D) = \sum m(0,1,4,8,9,10) + d(2,11)$
- 12.(a) Draw the circuit diagram of a 2 line to 4 line decoder using suitable logic gates. (5)
 (b) Write the VHDL code for a 4 to 1 multiplexer. (5)
13. Realize a clocked R-S Flipflop using NAND gates. Show the realization of (i) JK flipflop (ii) DFF (iii) TFF and explain their operation with truth table. (10)
 Give one application of each flipflop.
- 14.(a) Construct a 4x16 decoder using any 2x4 decoders. (5)
 (b) Write a VHDL code for an 8 to 3 binary encoder. (5)
- 15.(a) Write a short notes on the following : (5)
 (i) Built-in-self test
 (ii) Built-in logic block observer
 (b) How is testing done in PCB's ? (5)
- 16.(a) Explain the working of transmission gate with the help neat diagram. (5)
 (b) Describe the design flow for logic circuits. (5)
17. Write short notes no the following :
 (a) CAD tools
 (b) ASM charts
 (c) Clock synthesis

FACULTY OF INFORMATICSB.E. 2 / 4 (IT) II - Semester **Supplementary Examination**, December 2006Subject : **Electronic Communication Techniques**

Time : 3 Hours

Max. Marks : 75

Note : Answer all questions of Part-A and answer any **five** questions from Part-B. Assume any data if missing.

Part - A (25 Marks)

1. For 3 cascaded stages, each with noise figures of 4dB and power gains of 12dB each, determine the over all noise figure in dB.
2. Draw a schematic diagram of crystal oscillator module and explain its operation.
3. For a citizens band receiver using high side injection with an RF carrier of 30Mz and an IF centre frequency of 450KHz. Determine (i) image frequency (ii) IFRR for a pre-selector Q of 100.
4. Draw the circuit diagrams of pre-emphasis and de-emphasis. Explain their function and draw their attenuation curves.
5. Draw the circuit diagram of balanced slope detector and its voltage-versus-frequency response curve. What is the part-played by each component in the cct diagram.
6. What is balun ? Draw two types of balun arrangements and explain.
7. A rectangular wave guide dimensions are 0.9" x 0.4". What is its cutoff frequency and cutoff wave length ?
8. List the optical properties of radio waves.
9. A microwave receiver has a total noise power of -110 dBm and an overall noise figure 10dB. For a minimum CNR of 17dB at the input to the FM detector, determine the minimum receive carrier power.
10. Show that geostationary altitude is approximately 36,000 km.

Part - B (50 Marks)

- 11.(a) Discuss the satellite system parameters.
 (b) For a satellite with the up-link $E_b / N_0 = 16\text{dB}$ and a downlink $E_b / N_0 = 12\text{dB}$ determine the overall E_b / N_0 .
 (c) Determine the terrain sensitivity loss for an 8GHz carrier that is propagating over a very smooth and dry terrain.
- 12.(a) Draw the (i) end of electric and magnetic field vectors in a rectangular waveguide and (ii) the magnetic field configuration in a longitudinal section and explain.
 (b) Derive an expression for free space path-loss and express in dB.
 (c) Draw the schematic of a log-periodic antenna and list its salient features.
- 13.(a) Draw the circuit diagram of Foster-Seeley discriminator and with the help of vector diagrams explain its operation.
 (b) Explain in detail the various types of transmission line losses.
- 14.(a) Draw the circuit diagram of a separately excited mixer and explain its operation.
 (b) Explain in detail the advantages and disadvantages of single-sideband transmission.
 (c) Draw the circuit diagram of varactor diode direct FM modulator and

..2..

15.(a) For an AM DSBFC wave with an un modulated carrier voltage of $25V_p$ and a load resistance of 50Ω , determine (i) power in the un modulated carrier. (ii) power in the modulated carrier, USB, LSB and the total transmitted power for a modulation index of 0.5.

(b) List the four requirements for a feedback oscillator to work and explain them in detail. List the factors that select the type of oscillator to be used for a particular application.

16.(a) Explain in detail TDR technique.

(b) Explain in detail the basic principles of FM stereo broadcasting.

17. Write notes on the following :

(a) Antenna radiation patterns

(b) SSB receiver

(c) Wave front

1
1:
13
14
15
16
17.

FACULTY OF INFORMATICS

Code No. 11274

B. E. 2 / 4 (IT) II - Semester (Supplementary) Examination, December 2006

Subject : Computer Graphics

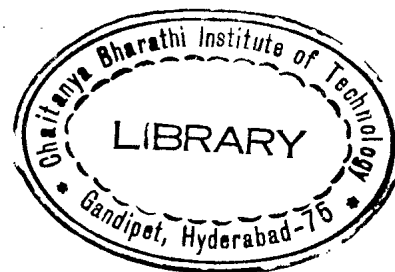
Time : 3 Hours}

{Max. Marks: 75

Note : Answer ALL questions of Part – A and Answer any FIVE questions from Part - B.

PART – A (25 Marks)

1. Explain briefly about joystick .
2. What is meant by Raster Scan System ?
3. What are the basic attributes for characters ?
4. Define Window .
5. What is rotation transformation ?
6. What is meant by polygon clipping ?
7. Explain about GKS Graphics standards.
8. What is meant by basic modeling concepts ?
9. What is meant by BSP tree ?
10. What is meant by Back-face detection ?



PART – B (5x10 = 50 Marks)

- 11.(a) Explain mid point circle algorithm .
(b) Write short notes on character generation methods.
- 12.(a) Find the matrix transformation for stating the triangle with vertices (7, 2), (3, 2) and (3, 9) with 90 degrees keeping the vertex (3, 9) fixed.
(b) Explain briefly about curve attributes.
- 13.(a) Describe the Cohen-Sutherland algorithm for line clipping.
(b) Explain two dimensional viewing functions.
- 14.(a) Explain in detail about hierarchical modeling with structures.
(b) Describe graphical input functions .
- 15.(a) Explain in detail about spline representations .
(b) Explain about Octrees.
- 16.(a) Explain the concept of projections and derive the matrix from the standard perspective projection.
(b) Describe z-buffer algorithm for hidden surface removal .
17. Write short notes on the following :
 - (a) Ground shading and phong shading.
 - (b) Bezeor curves
 - (c) Sutherland-Hodgman polygon clipping.

REFERENCE

FACULTY OF INFORMATICS

Code No. 11275

B.E. II / IV (Information Technology) II Semester (Supplementary) Examination,
December 2006

Subject: **Computer Organization & Microprocessors**

Time: 3 Hours.

Max. Marks: 75

Note: Answer all questions from Part A and five questions from Part B.

Part - A (Marks: 25)

1. Define a system bus. Explain its structure. 3
2. Explain integer representation. 2
3. Explain the Execution of Complete instruction. 3
4. List the performance considerations of a processor. 3
5. What is a DMA controller ? 3
6. Explain interrupt-initiated I / O. 2
7. What are I / O ports ? Explain. 2
8. Briefly explain the programming 8255A. 2
9. Differentiate between Static RAMs and dynamic RAMs. 2
10. What is instruction queue ? Explain. 3

Part - B (5x10 = 50)

- 11.a) Explain various addressing modes.
b) Explain basic I/O operations.
- 12.a) Explain the pin-configuration of 8085 microprocessor.
b) Discuss memory and I/O read cycle.
13. Discuss the microprogrammed control unit in detail.
14. Explain 8259-programmable interrupt controller.
- 15.a) Explain memory hierarchy.
b) Discuss the branching in pipelining.
16. Discuss the Architecture of 8085 with a block diagram.
17. Write short notes on the following:
 - a) Interrupts
 - b) Stack Organisation
 - c) Standard I/O interfaces

FACULTY OF INFORMATICS

Code No. 11276

B.E. II / IV Year (IT) II – Semester (Supplementary) Examination,
December 2006

Subject : DATA BASE SYSTEMS

Time : 3 Hours

Max. Marks: 75

Note : Answer ALL questions from Part – A and answer any FIVE questions from Part – B.

PART- A

(Marks : 25)

1. Differentiate between 'instance' and 'schema'. 2
2. Describe about 'Data Abstraction'. 3
3. What is the purpose of 'order by' operator in SQL. 2
4. Discuss about 'Triggers'. 3
5. Briefly explain about 'Tertiary Storage'. 2
6. Discuss the features of 'B-Trees'. 3
7. Explain the property of 'Durability'. 2
8. Explain about 'Buffer Management'. 3
9. Briefly explain about 'Centralized Systems'. 2
10. Discuss about 'Deadlock Handling' in Distributed Databases. 3

PART- B

(Marks : 5 x 10 = 50)

11. a) What are the components in 'Storage Manager'. 5
Explain each of them.
- b) Describe about 'Domain Relational Calculus'. 5
12. a) Consider the following database. 3 + 3
Account (Branch-Name, Account-Number, Balance)
Depositor (Account-Number, Depositor-Name)
Dep-Details (Depositor-Name, Depositor-City)

Write an SQL query to find the following.

- i) Find the balances of all the depositors who are living in 'Delhi'.
 - ii) Find the names of Depositors, Who are living in 'Madras' and having balance rupees five thousands.
- b) Describe about 'Dependency Preservation'. 4
13. a) Describe about 'Extendable Hashing'. 6
- b) Briefly explain about 'Materialization'. 4
14. a) What is the functionality of 'Two-Phase Locking Protocol'. 4
- b) Explain about 'Immediate database modification'. 6
15. a) Differentiate among the following. 6
Replication Transparency
Fragmentation Transparency
Location Transparency
- b) What is meant by 'Interquery Parallelism'. 4
16. a) Explain the concept of 'Assertions'. 5
- b) List and explain about various RAID levels. 5
17. Write short notes on the following. 3 + 3 + 4
- a) Second Normal Form
 - b) Database Users
 - c) E-R diagram

* * * * *