

5E5101	Roll No. : _____	Total Printed Pages : 4
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">5E5101</div>	
B. Tech. (Sem. V) (Mercy Back) Examination, November 2018 Computer Sc. & Engineering 5CS1A Computer Architecture (CS, IT)		

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____ 2. NIL _____

UNIT - I

- 1 (a) If a computer has 128 operation codes and 512 K addresses, how many bits would be required for
- (i) Single address instruction
 - (ii) Two address instruction
- 6
- (b) What is instruction ? What are different parts of instruction ? Explain the significance of each part of instruction with an example.
- 6
- (c) What do you mean by instruction set completeness ?
- 4

OR

2-4-80

- 1 (a) Explain the following terms with reference to Von-neumann machines :
- (i) SISD
 - (ii) SIMO
 - (iii) MISD
 - (iv) MIMO
- 8
- (b) A digital computer has a common bus system for 16 registers of 32 bit each. The bus is constructed with multiplexers.
- (i) How many selection input are there in each multiplexers ?
 - (ii) What size of multiplexer are needed ?
 - (iii) How many multiplexers are there in the bus ?
- 8

UNIT - II

- 2 (a) Explain the following in detail :
- (i) Address sequencing
 - (ii) Hardwired control unit
- 8
- (b) Draw and explain the organization of CPU showing the connections between the register to a common bus.
- 8

OR

- 2 (a) Explain speed up, efficiency and throughout in pipelining.
- 8
- (b) Is there any different in RISC and CISC architecture ? Explain.
- 8

UNIT - III

- 3 (a) Explain Array Multiplier with a suitable example. 8
- (b) Explain stack organization of central processing unit. 8

OR

- 3 Multiply and steps of $(-37) \times (21)$ multiplication are to be shown using Booth multiplier algorithm. 16

UNIT - IV

- 4 (a) Construct a memory system having static $1k \times 4$ RAM. How many such RAMs will be required to
- (i) Construct $1k \times 8$ RAM bank ?
- (ii) $4k \times 4$ RAM memory bank ? Show the block diagram and the address decoding circuit. 10
- (b) Write short note on : Virtual memory. 6

OR

- 4 (a) What is cache coherency ? Why it is necessary ? Explain different approaches for cache coherency. 8
- (b) Explain Associative memory with its hardware organization. Discuss the procedure for reading and writing data in associative memory. 8

UNIT - V

5 (a) Design a parallel priority interrupt hardware for a system with eight interrupt sources.

8

(b) Why does DMA have priority over the CPU when both request a memory transfer ?

8

OR

5 Write short note on :

(a) Priority Interrupts

(b) I/O Interface.

2×8=16

5E5102	Roll No. : _____	Total Printed Pages : 3
	5E5102	
	B. Tech. (Sem. V) (Mercy Back) Examination, November 2018 Computer Sc. & Engg. 5CS2A Digital Logic Design	

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

*Attempt any **five** questions, selecting **one question** from each unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL _____ 2. NIL _____

UNIT - I

- 1 (a) What are the data type in VHDL ? Explain with example. 8
- (b) What are the basic modeling constructs in VHDL ? 8

OR

- 1 (a) Explain with example the lexical elements of VHDL language. 8
- (b) Explain in detail VHDL and its used in digital logic. 8

UNIT - II

- 2 (a) What is simulation and synthesis process in VHDL ? 8
- (b) Explain packages and use clauses in VHDL. 8

OR

- 2 (a) What is difference of generate and concurrent statement ? Explain with suitable example. 8
- (b) Explain different kinds of sub-program with examples. 8

UNIT - III

- 3 (a) Explain clock skew, set up time and hold time with suitable examples. 8
- (b) Explain concept and working of ROM and PLA. 8

OR

- 3 (a) Explain concept and working of FPGA and PLD. 8
- (b) Describe the steps of synchronous sequential circuit with suitable example. 8

UNIT - IV

- 4 (a) What is races and what is process of race free assignment ? 8
- (b) Explain design procedure of asynchronous circuits. 8

OR

4 (a) Explain the procedure of state reduction of incompletely specified machine with a suitable example. 8

(b) Explain function hazards with suitable examples. 8

UNIT - V

5 (a) Write short note on SRAM or flash memory. 8

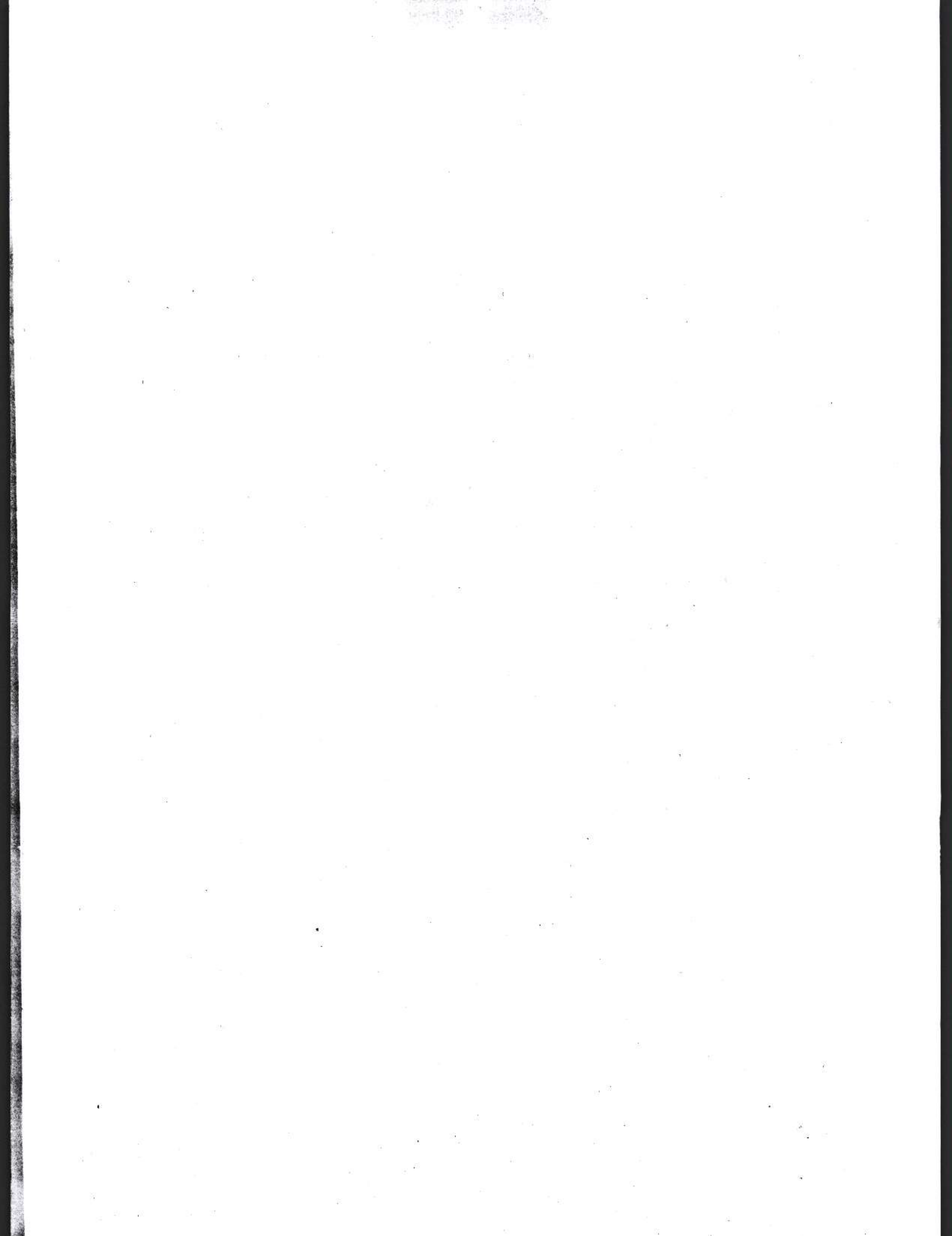
(b) Why should one prefer Xilinx Virtex-II pro ? 8

OR

5 (a) Why we use FPLD kits and explain logic elements and programmability. 8

(b) Write short note on logic synthesis or look up table technology. 8





UNIT - II

- 2 (a) Explain frame structure of HDLC Protocol and compare with PPP. 8
- (b) How is the simple parity check related to the two dimensional parity check? 8

OR

- 2 (a) Explain pure ALOHA and slotted ALOHA. Define throughput analysis of pure ALOHA and slotted ALOHA. 8
- (b) Write the applications of CSMA/CD. 4
- (c) Explain error detecting capability of a polynomial code. 4

UNIT - III

- 3 (a) What is hidden node and exposed node problems ? Explain with example. 8
- (b) Explain virtual LANs. How we can configure VLAN in switch ? 8

OR

- 3 (a) Draw and explain 802.11 architecture and protocol stack. 8
- (b) Explain protocol stack for bluetooth architecture. 8

UNIT - IV

- 4 (a) Draw and explain TDMA superframe structure and burst structure. 8
(b) Explain the division and frequency division multiplexing. 8

OR

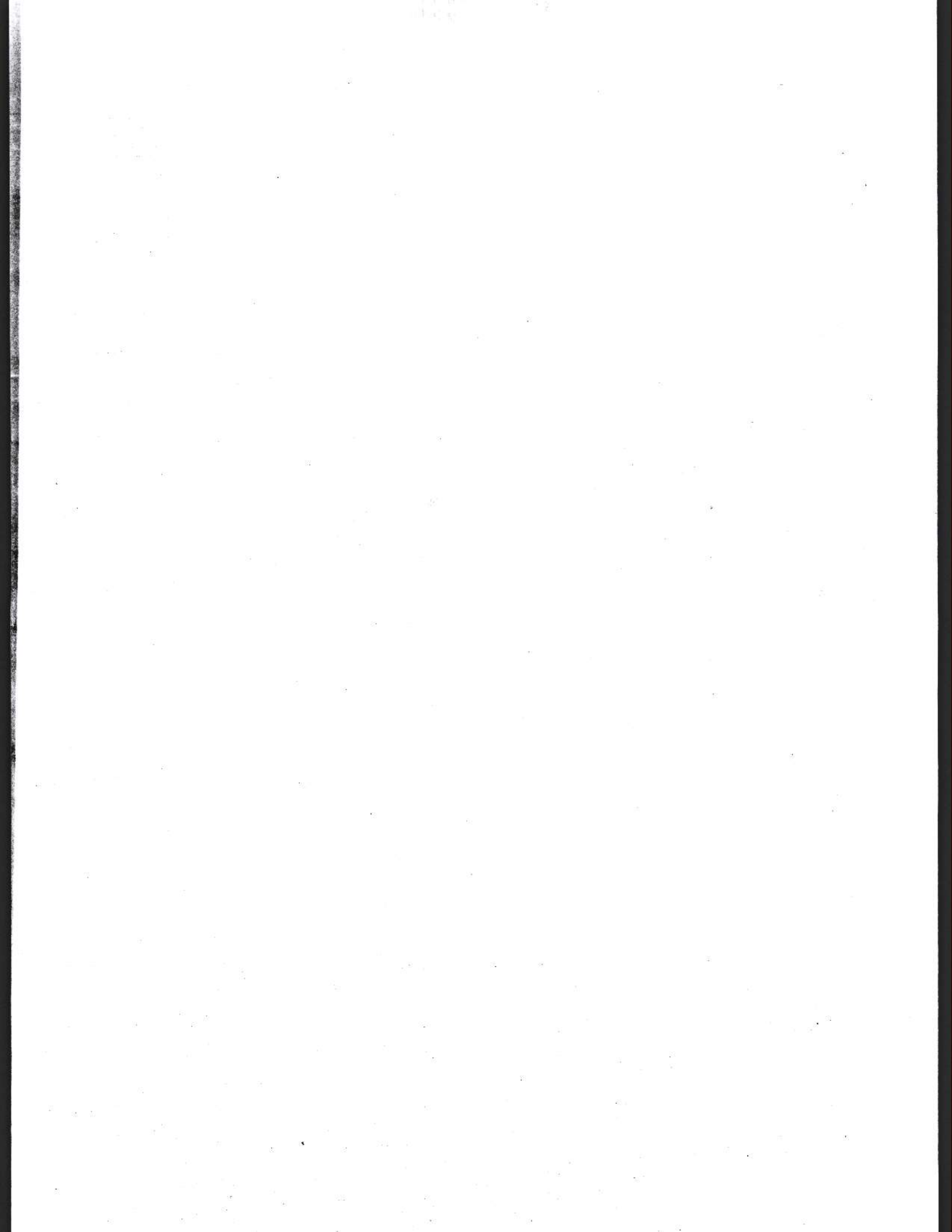
- 4 (a) Describe ADSL. Also discuss the two system used in ADSL. 8
(b) Compare TDM and FDM. 4
(c) Explain the division and space time - space division switching. 4

UNIT - V

- 5 (a) Write short noets on any three :
(i) IMT-2000
(ii) M-sequence
(iii) Hand of process
(iv) Walsh codes 4×3=12
(b) Define FHSS 4

OR

- 5 (a) Explain CDMA with help of an example. 8
(b) Explain the generation of PN sequences. 4
(c) Define WCDM. 4



5E5104

Roll No. : _____

Total Printed Pages : 3

5E5104

B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Computer Sc. & Engineering
5CS4A Database Management Systems (CS, IT)

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

- 1 (a) Define database and DBMS. How database approach is better than the traditional file approach ? Explain. 8
- (b) Explain the role and responsibilities of a DBA. 8

OR

- 1 (a) Explain the components of DBMS. Draw a neat diagram of the DBMS architecture. 8
- (b) What is the key ? Explain super, candidate and primary key with an example. 8

UNIT - II

- 2 (a) Explain E R-diagram with suitable example. 8
- (b) What is Entities ? Explain relationship within entities and attributes. 8

OR

- 2 (a) Draw the E R-diagram for college information system. 12
- (b) Explain attributes and relationships. 4

UNIT - III

- 3 (a) Explain the difference between relational algebra and relational calculus. 8
- (b) Explain different unary and binary operations of relational algebra. 8

OR

- 3 (a) Give formal definitions and explain with example.
- (i) Division operation
 - (ii) Set operations
 - (iii) Selection
 - (iv) Projection
- 4×4=16

UNIT - IV

- 4 (a) Explain different DDL and DML statements. 8
- (b) What is trigger ? What is the difference between a trigger and procedure ? 8

OR

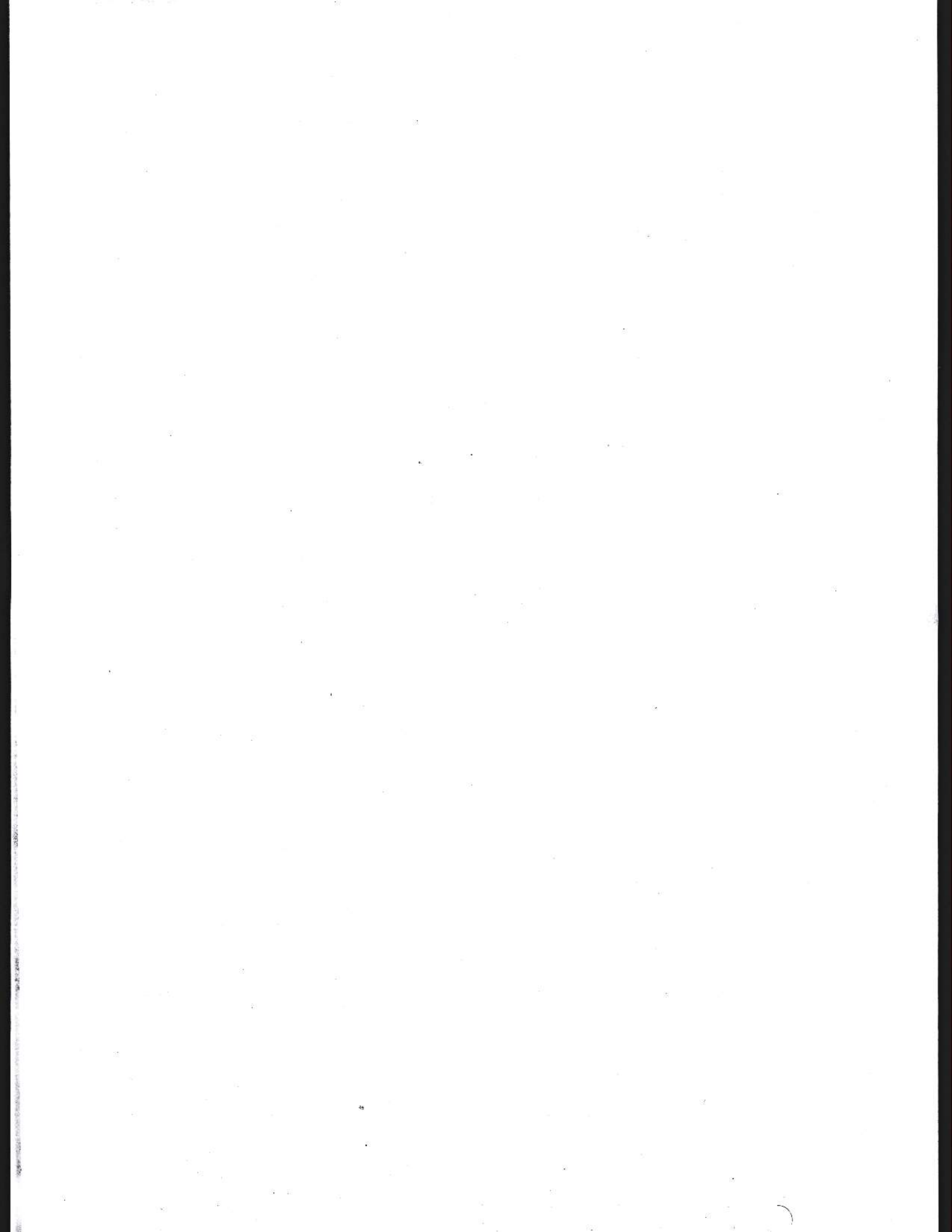
- 4 Write short notes on :
- (i) ODBC
 - (ii) IDBC
 - (iii) Embedded SQL
 - (iv) Dynamic SQL
- 4×4=16

UNIT - V

- 5 What is Normalization ? Explain all the normal forms with help of examples. 16

OR

- 5 (a) What do you mean by Schema Refinement ? 8
- (b) Explain the difference between 3Nf and BCNF. 8
-



5E5105

Roll No. : _____

Total Printed Pages : **3****5E5105**

B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Computer Sc. & Engineering
SCS5A Operating Systems (CS, IT)

Time : 3 Hours

Total Marks : 80
Min. Passing Marks : 24

*Attempt any five questions, selecting one question from each unit.
 All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)*

1. NIL _____ 2. NIL _____

UNIT - I

- 1 (a) What is the need of BIOS ? Explain Boot strap loader also. 8
- (b) How an operating system works as a resource manager and virtual machine ? 8

OR

- 1 (a) Explain the architecture of operating system. 8
- (b) What do you mean by processor scheduling ? Explain the various levels of scheduling. 8

UNIT - II

- 2 (a) Describe the solution of Dining-Philosophers problem. 8
- (b) Consider the following set of processes with arrival time and CPU burst time given in ms.

Process	Arrival time	Burst time
P ₁	0	8
P ₂	1	4
P ₃	2	9
P ₄	3	5

What is the average waiting time for these processes with preemptive SJF scheduling ?

8

OR

- 2 (a) What do you understand by Semaphores ? Can it be useful to solve reader-writer problem ? Explain. 8
- (b) What are different algorithmic solutions of Critical Section problem ? Explain. 8

UNIT - III

- 3 (a) What is deadlock ? What are necessary conditions for deadlock to occur ? 8
- (b) Consider the following snapshot of system. The given jobs are of memory size 13 kB, 5 kB only.

Address	Size of Free space
005	2
070	28
105	12
279	82
395	15

Compare best fit, worst fit and first fit memory allocation schemes. Show the allocated addresses and free spaces after every job for all 3 schemes.

8

OR

- 3 (a) Write and explain Bankers algorithm for deadlock avoidance ? 8
- (b) Explain difference between Internal and External fragmentation. 8

UNIT - IV

- 4 (a) What do you understand by Belady's Anamoly ? Explain. 8
- (b) Consider 3 pages frames and following reference string use FIFO page replacement algo to calculate the number of page faults in each reference string is :
- 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 8

OR

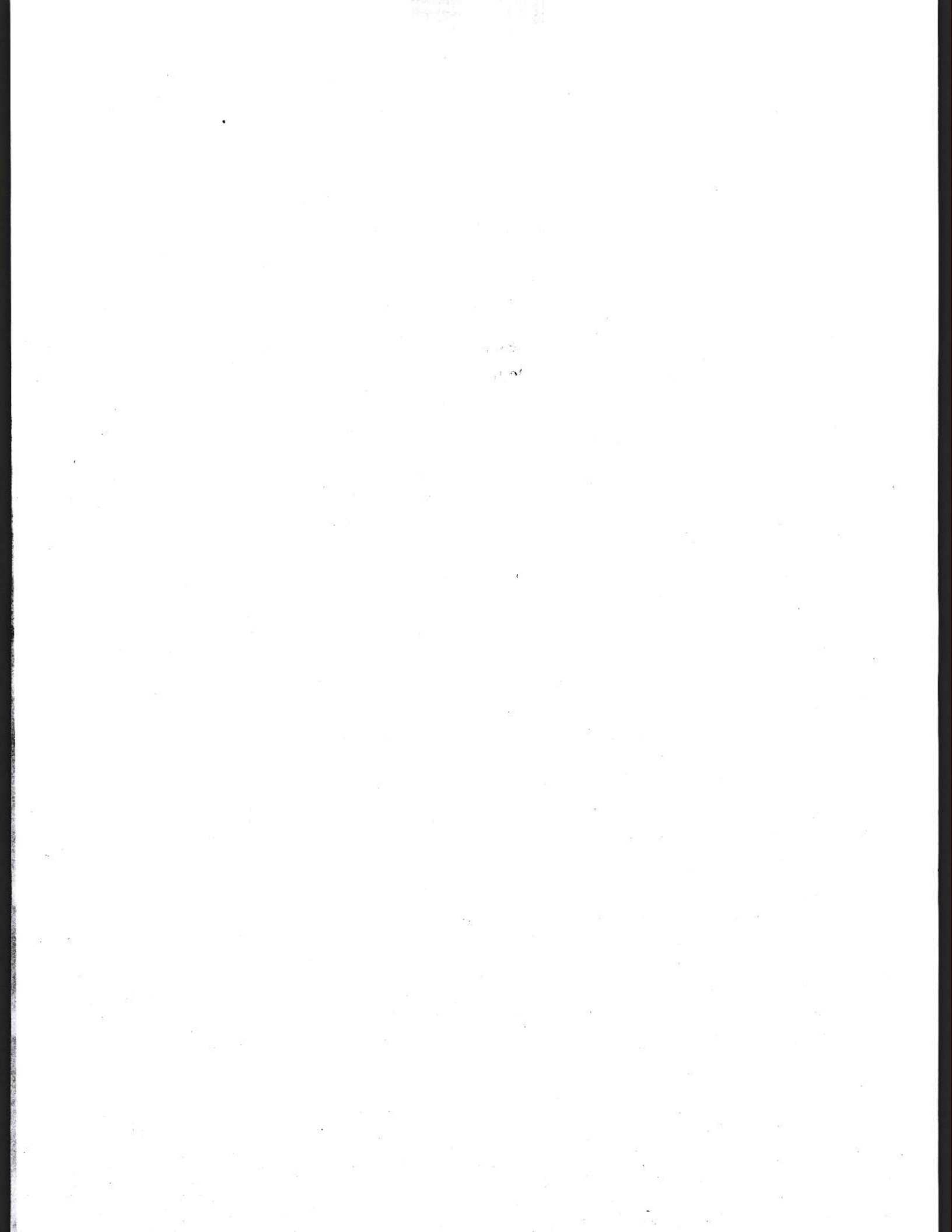
- 4 Explain the following :
- (i) Demand Paging
 - (ii) Segmentation with Paging scheme
 - (iii) Thrashing
 - (iv) Global versus local allocation.
- 4×4=16

UNIT - V

- 5 (a) Explain the classification of Allocation Methods. 8
- (b) Explain the concept of spooling with all its types and its advantage and disadvantage. 8

OR

- 5 Suppose that a disk drive has 200 cylinders, numbered 0 to 199. The drive is initially at cylinder 53. The queue with request of I/O to blocks in cylinder 98, 183, 37, 122, 14, 124, 65, 67
- Count the total head movement of cylinders in SCAN and C SCAN scheduling. 16



- 1 (a) What is Red-Black Tree ? Create a Red-Black tree by inserting the keys in the following sequence into an initially empty Red-Black tree : 13, 10, 8, 3, 4 and 9. Show each step also. 8
- (b) Explain interval trees with the help of example. 8

UNIT - II

- 2 (a) Explain 2-3-4 trees with the help of example. Explain the functions of insertion and deletion with an example. 8
- (b) Explain binomial heaps and its operation with example. 8

OR

- 2 (a) Explain the various technique used in amortization analysis. 8
- (b) Write short notes on :
- (i) Binoial trees
- (ii) Implementing fibonacci heap.

4×2=8

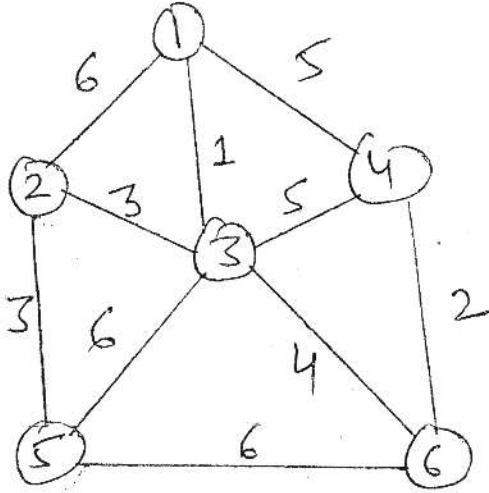
UNIT - III

- 3 (a) Write and explain Ford-Fulkerson Max Flow Algorithms. 8
- (b) Explain the following terms incorporated with graphs with the help of example :
- (i) Circuits
- (ii) Cut-vertices
- (iii) Planar and dual graphs.
- (iv) Cut-sets

2×4=8

OR

3 (a) Consider the following Graph G.



Apply Kruskal's algorithm to G. List the edge of the forest that is grown, in the order that they added. Find Minimum Spanning tree also.

8

(b) Write and explain single Min-Cut Max-Flow theorem of Network flows.

8

UNIT - IV

4 (a) Explain the bitonic sorting network with suitable example.

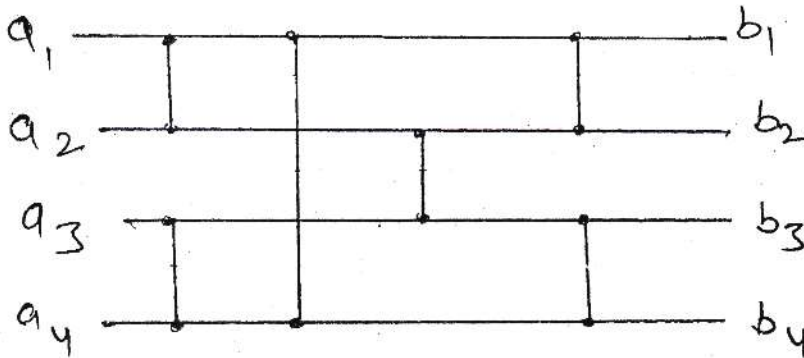
8

(b) Explain concatenable queues using 2-3 trees with an example.

8

OR

4 (a) Use the zero-principle to prove that the comparison network show in figure below, is a sorting network.



8

- (b) Explain various operation on disjoint sets. Also describe its union-find problem.

8

UNIT - V

- 5 (a) What is Modular Arithmetic ? Also explain methods to solve, modular linear equation.

8

- (b) Explain Chinese Remainders theorem with the help of example.

8

OR

- 5 (a) Explain Euclid algorithm with the help of example. Find out GCD (14300, 5915).

8

- (b) Write short notes on :

(i) Computation of Discrete logarithm.

(ii) Integer factorization.

4×2=8

269

5E5107

Roll No. : _____

Total Printed Pages : 4

5E5107

B. Tech. (Sem. V) (Mercy Back) Examination, November - 2018
Computer Sc. & Engg.
5CS6.2A Digital Signal Processing (CS, IT)

Time : 3 Hours]

[Maximum Marks : 80

[Min. Passing Marks : 24

*Attempt any five questions, selecting one question from each unit.
All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

- 1. NIL _____
- 2. NIL _____

UNIT - I

- 1 (a) List out the properties of LTI system. Explain each with the help of an example. 8
- (b) Check whether the following systems are Linear and time invariant :
 - (i) $F[x(n)] = a[x(n)]^2 + 3[x(n)]$
 - (ii) $f[x(n)] = n[x(n)]^2$ 8

OR

- 1 (a) Obtain the convolution of following sequences :

$$x(n) = U(n); \quad h(n) = 2^n U(n)$$

8

- (b) Explain the following terms of the LTI (Linear Time Invariant) system :

(i) Time Invariant

(ii) Linear

(iii) Causal

(iv) Stable

8

UNIT - II

- 2 (a) Define ROC for Z-transform. Write down its properties for Z-transform.

6

- (b) Determine the Fourier transform of following signal :

(i) $x(n) = U(n) - U(n-6)$

(ii) $x(n) = 2^n U(-n)$

10

OR

- 2 (a) Find out the linear convolution of an FIR filter with Impulse Response $h(n) = \{1, 2, 4\}$ to the input sequence $x(n) = \{1, 2\}$.

10

- (b) Discuss various properties of DTFT in brief.

6

UNIT - III

- 3 (a) What do you mean by aliasing ? 6
- (b) Define sampling theorem. Explain Interpolation Technique for the reconstruction of a signal from its samples. 10

OR

- 3 (a) Determine the Nyquist rate corresponding to each of the following signals :
- (i) $x(t) = \frac{1}{2\pi} \cos(4000 \pi t) \cos(1000 \pi t)$
- (ii) $x(t) = \sin \frac{(4000 \pi t)}{\pi t}$ 8
- (b) Explain the sampling of discrete time signals. Also differentiate between ideal and practical sampling. 8

UNIT - IV

- 4 (a) Determine the four point DFT for $x(n) = \{0,1,2,3\}$ using DIT-FFT algorithm. 8
- (b) Define the convolution. Explain linear convolution. 8

OR

- 4 (a) Explain decimation in Frequency FFT (DIF-FFT) algorithm with diagram. 8
- (b) Explain Parseval's theorem and circular shift property for DFT. 8

272

UNIT - V

5 (a) Design a band pass filter using bilinear transformation.

Pass band attenuation = -3 dB

Stop band attenuation = -15 dB

Pass band upper cut off frequency = 0.35π rad/sec.

Pass band lower cut off frequency = 0.25π rad/sec.

Sampling Rate = 1 Sample/sec.

Stop band frequencies

= 0.1π Rad/sec.

= 0.7π Rad/sec.

10

(b) Write short notes on :

(i) Hamming window

(ii) Structure of FIR Filter.

6

OR

5 Write short notes on :

(a) Kaiser window

(b) Chebyshev Filter

(c) Rectangular window

(d) Butterworth Filter.

4×4=16