

B.TECH. DEGREE EXAMINATION, MAY 2010**Fourth Semester**

Branch : Information Technology

LINEAR INTEGRATED CIRCUITS AND APPLICATIONS (T)

(2008 admissions—Regular—2007 admissions—Improvement/Supplementary)

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.***Part A***Each question carries 4 marks.*

1. Compare characteristics of ideal and non-ideal op-amps.
2. What are the applications of V to I and I to V converters ?
3. What are the characteristics of active filters ?
4. Compare Butterworth and Chebyshev filters.
5. What is a hybrid converter ?
6. What are the merits and demerits of flash converter ?
7. Discuss the function of a series pass transistor.
8. How is current boosting achieved in 723 IC ?
9. Define Capture range, lock range and pull-in-time.
10. What are the characteristics of IC power amplifiers ?

(10 × 4 = 40 marks)

Part B*Each question carries 12 marks.*

11. (a) Discuss the frequency response of a practical operational amplifier.
Or
(b) Draw the internal structure of an op-amp. Explain the functions of each component.
12. (a) Design a π order HPF for a cut-off frequency of 10 kHz and pass band gain of 1.5.
Or
(b) Draw and explain the circuit diagram of a high frequency oscillator.

Turn over

13. (a) Draw the circuit of a dual slope ADC. Explain its principle of operation. What are its merits and demerits ?

Or

(b) Explain with a diagram the principle of operation of an analog multiplier.

14. (a) Explain the internal structure of IC 723 with the help of a functional block diagram.

Or

(b) Design a voltage regulator to meet the following specifications :—

$V_s = 18V \pm 3V$; $V_o = 9V$; $I_o = 10$ to 15 mA

$V_z = 5.6$ V and $P_z = 0.5$ W

15. (a) Draw and explain the building blocks of LM 565.

Or

(b) Discuss the applications of PLL in communication engineering.

(5 × 12 = 60 marks)

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks

11. (a) Discuss the frequency response of a practical operational amplifier.

Or

(b) Draw the internal structure of an op-amp. Explain the functions of each component.

12. (a) Design a n-order HPF for a cut-off frequency of 10 kHz and pass band gain of 1.5.

Or

(b) Draw and explain the circuit diagram of a high frequency oscillator.

Turn over

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2010

Fourth Semester

Branch—Information Technology

COMPUTER SYSTEMS ARCHITECTURE (T)

(Regular/Improvement—2007 Admissions/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer all questions briefly.
Each question carries 4 marks.*

1. What are the different flages in 8085 ? Explain.
2. What is meant by addressing modes ? List and explain any *two* of them.
3. With the help of an example each, explain the effect of the following instructions in 8085 ?
 - (i) ADD M.
 - (ii) IN 20 H.
4. Explain any *two* stack instruction, giving examples.
5. Describe hardwised control unit ? What are merits ?
6. Explain the principle of “restoring addition”.
7. What is memory paging ? What are its applications ?
8. How memory interleaving is done ?
9. Explain memory mapped I/O and direct I/O.
10. Where do we prefer interrupt driven I/O ? Give reason.

(10 × 4 = 40 marks)

Part B

*Answer either (a) or (b) section from of each module.
Each full question carries 12 marks.*

MODULE 1

11. (a) (i) Explain the functioning of all the registers in a CPU. (6 marks)
(ii) Explain the execution steps of data movement instructions. (6 marks)

Or

- (b) (i) Explain clearly, the basic control signals to be generated by a processor for memory and I/O read and write operations. (6 marks)
(ii) Describe the layered architecture of a computer system. (6 marks)

Turn over

MODULE 2

12. (a) State and explain the various call instructions in 8085. (12 marks)

Or

- (b) What is meant by Immediate and Implicit addressing? Give two examples each and explain them. (12 marks)

MODULE 3

13. (a) Explain floating point addition with a flow chart and a block diagram. (12 marks)

Or

- (b) (i) Explain micro instruction execution. (6 marks)

- (ii) What are the different schemes followed in optimizing control memory in microprogram control? (6 marks)

MODULE 4

14. (a) Distinguish between segmented and paging memory system. Design a memory system having average access time 0.5 μ S with the help of two level memories having 1 μ S and 2 ns of access time. (12 marks)

Or

- (b) (i) Describe the address mapping schemes used for virtual memory. (6 marks)

- (ii) Explain the different types of address mapping techniques for cache memory. (6 marks)

MODULE 5

15. (a) What are the important features of RS 232 C and how they differ from SCSI? (12 marks)

Or

- (b) (i) With the help of a flow chart, explain programmed I/O data transfer operation. (6 marks)

- (ii) When would interrupt be used to control an I/O? How are several interrupting I/O devices handled through a single-interrupt line? Give the different methods used. (6 marks)

[5 × 12 = 60 marks]

B.TECH. DEGREE EXAMINATION, MAY 2010**Fourth Semester**

Branch : Information Technology

OBJECT ORIENTED PROGRAMMING IN C++ (T)

(2008 admissions—Regular/2007 admissions—Improvement/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A*Answer all questions.**Each question carries 4 marks.*

1. What is encapsulation ? Why is data considered safe if encapsulated ?
2. What are literals ? How many types of literals are available in C++ ?
3. How are arrays and structures related ?
4. Discuss the syntax of nested structures.
5. What is a class ? How does it accomplish data hiding ?
6. What is a friend function ? What are its merits and demerits ?
7. Why is it necessary to overload an operator ?
8. Discuss the significance of function overloading in C++.
9. What is an iterator ? What are its functions ?
10. Discuss the concept of virtual destructors.

(10 × 4 = 40 marks)

Part B*Answer all questions.**Each question carries 12 marks.*

11. (a) Discuss in detail the basic concepts of object oriented programming.

Or

- (b) Write a program to find all pythagorean triplets in the range 100 to 1000.

(A Pythagorean triplet is a set of three integers i, j, k , such that $i^2 + j^2 = k^2$).**Turn over**

12. (a) Explain with an example the need for nested structures in C++.

Or

- (b) Write a program to store 20 records containing country, capital and name of its President. The president name is a record containing last name, first name and preface (like Mr, Mrs, Miss etc.) The program should display the entire record when the country name or its capital is given.

13. (a) What is dynamic initialization ? Explain with an example its implementation.

Or

- (b) Write a program to sort an array B[-3 : 5] using (i) selection sort (ii) bubble sort.

14. (a) Explain with an example the method and uses of function overloading.

Or

- (b) Describe the syntax of multiple inheritance. What are its advantages ?

15. (a) Explain with an example the uses and implementation of virtual destructors.

Or

- (b) Explain the mechanisms of handling synchronous and asynchronous exceptions.

(5 × 12 = 60 marks)

Part B

Answer all questions

Each question carries 12 marks

- (a) Discuss in detail the basic concepts of object oriented programming.

Or

- (b) Write a program to find all pythagorean triplets in the range 100 to 1000.

(A Pythagorean triplet is a set of three integers (i, j, k) such that $i^2 + j^2 = k^2$)

Turn over

B.TECH. DEGREE EXAMINATION, MAY 2010

Fourth Semester

ENGINEERING MATHEMATICS—III (CMELRPTANUS)

(Common for all Branches)

[2008 admissions—Regular/2007 admissions—Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Answer one full question from each module.

Statistical tables permitted.

Module 1

I. (a) Solve $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + y = \sin 4x \sin 2x$. (7 marks)

(b) Solve $(D^2 - 2D + 1)y = e^{-2x} \cos 2x + (2x^2 + 1)e^x$. (7 marks)

(c) Solve $x^2y'' + 5xy' + 4y = \cos(2 \log x)$. (6 marks)

Or

II. (a) Solve $(D^2 + 1)y = (x^2 - 1) \cos 2x$. (7 marks)

(b) Solve by the method of variation of parameters $y'' + y = \operatorname{cosec} x$. (6 marks)

(c) Solve the system of simultaneous linear equations

$$\begin{aligned} (5D + 4)x - (2D + 1)y &= e^{-t} \\ (D + 8)x - 3y &= 5e^{-t} \end{aligned}$$

where $D = d/dt$.

Module 2

III. (a) Form the partial differential equation from $z = (x-a)^2 + (y-b)^2$. (6 marks)

(b) Solve $(x^2 - y^2 - z^2)p + 2xyq = 2xz$. (7 marks)

(c) Solve $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x \partial y} = \sin x \cos 2y$. (7 marks)

Or

Turn over

- VIII. (a) The probability that a pen manufactured by a company will be defective is 0.15. A random sample of 10 pens are chosen. What is the probability that in the sample (i) not more than one is defective ; (ii) at least 7 are good ; and (iii) all are good.

(10 marks)

- (b) Fit a Poisson distribution for the following data and hence calculate the theoretical frequencies:—

x	:	0	1	2	3	4	5
f	:	142	156	69	27	5	1

(10 marks)

Module 5

- IX. (a) A normal population has a mean 0.1 and S.D. 2.1. Find the probability that the mean of a sample of size 900 will be negative.

(10 marks)

- (b) A random sample of size 18 is taken from a normal population with mean 28 and variance 49. Find the probability that the sample variance S^2 will be less than the population variance.

(10 marks)

Or

- X. (a) In a random sample of size 500, the mean is found to be 20. In another independent sample of size 400, the mean is 15. Could the samples have been drawn from the same population with S.D. 4.

(10 marks)

- (b) In a large city A, 20 % of a random sample of 900 school boys had a slight physical defect. In another city B 18.5 % of a random sample of 1600 school boys had the same defect. Is the difference between the proportions significant.

(10 marks)

[5 × 20 = 100 marks]

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B.TECH. DEGREE EXAMINATION, MAY 2010

Fourth Semester

Branch : Information Technology

DATA STRUCTURES AND ALGORITHMS (T)

[2008 admissions—Regular/2007 admissions—Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. What are measures of complexity ?
2. Explain various scalar data types.
3. Represent linked list using a stack.
4. What are DEQUEUES ?
5. Compare Depth first and Breadth first search methods.
6. What are AVL trees ?
7. What are B-tree ?
8. Define collision in hashing.
9. Explain Bubble sort.
10. Derive best case time complexity of Bubble sort.

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each question carries 12 marks.

11. What is a Sparse matrix and how to represent a sparse matrix in memory ?

Or

12. Discuss circular queue, priority queue and D queue.
13. Explain the polynomial representation by linked lists.

Or

14. Write functions for the linked list operations.
15. What are Balanced Trees and B Trees ?

Or

16. Write recursive functions of in order and pre-order traversals.

Turn over

17. What are graphs ? Give applications of graphs in Computer Science.

Or

18. What is meant by Dynamic Memory Management ?

19. Compare selection sort with heap sort and insertion sort.

Or

20. What is the best case time complexity of Bubble sort and selection sort ?

(5 × 12 = 60 marks)

Maximum : 100 Marks

Time : Three hours

Part A

Answer all questions

Each question carries 4 marks

1. What are measures of complexity ?
2. Explain various scalar data types.
3. Represent linked list using a stack.
4. What are DEQUEUES ?
5. Compare Depth first and breadth first search methods.
6. What are AVL trees ?
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8. Define collision in hashing.
9. Explain Bubble sort.
10. Derive best case time complexity of Bubble sort.

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Part B

Answer all questions

Each question carries 12 marks

11. What is a sparse matrix and how to represent a sparse matrix in memory ?
- Or
12. Discuss circular queue, priority queue and D queue.
13. Explain the polynomial representation by linked lists.
- Or
14. Write functions for the linked list operations.
15. What are Balanced Trees and B Trees ?
- Or
16. Write recursive functions of in order and pre-order traversals.

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