

19-08-2025

Printing Pages : 2

Paper Code : - BECE-307
(C) (SVSU) : 2023-2024/R

Enrollment No.

B.TECH (CSE)
IIND YEAR IIIRD SEM EXAMINATION
ANALOG ELECTRONIC CIRCUITS
[BECE-307]

[Time : 3:00 Hours]**[Max. Marks : 70]****1 Answer Any Four****[4×3=12]**

- a. Write in brief about Slew rate of an Op-amp.
- b. Explain Barkhausen's criteria for oscillation.
- c. Define single ended mode of an Op-amp.
- d. Define (i) Conductor (ii) Semiconductor (iii) Insulator.
- e. Draw a neat diagram of Colpitts oscillator circuit.
- f. Provide applications of ADC circuits.

2. Answer Any Three**[3×4=12]**

- a. Write down ideal characteristics of an Op-amp
- b. Compare between Successive approximation type and Dual type ADC.
- c. Find out Maximum value of a signal to noise ratio of an 8 bit ADC with I/P range of 10 volt.
- d. Describe a Bipolar Junction transistor circuit with a neat sketch.

3. Answer Any Three**[3×6=18]**

- a. Prove that Switched capacitor circuit mimics the function of a resistor
- b. Compare the basic differences between Analog signals and Digital signals.
- c. With a neat diagram, explain working of Hartley Oscillator circuit .
- d. With a neat sketch describe VI characteristics of PN junction diode.

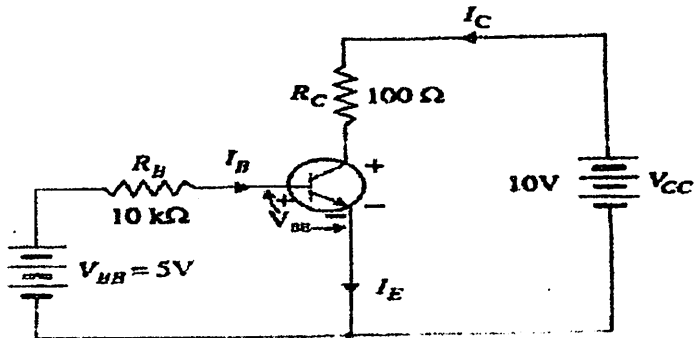
[P.T.O.]

4. Answer Any Two

[2x7=14]

- a. Compare between CB, CC and CE mode of Transistors.
- b. Explain in short about how Zener diode can act as a voltage regulator.

c.



In the Silicon transistor above, find VCB for $\beta=150$

5. Answer Any Two

[2x7=14]

- a. Design and explain working of R2R Ladder type Digital to Analog Converter.
- b. If CMRR is 100 dB, Input Common Mode Voltage is 12v and differential voltage gain is 4000 calculate output common mode voltage .
- c. With diagrams, explain Op-amp working as a comparator circuit.

Printing Pages : 2

Paper Code : BCSE-301

(A) (SVSU) : 2021-2022/R

Enrollment No.

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B. Tech. CS/IT
2 YEAR 3 SEM EXAMINATION
DATA STRUCTURE AND ALGORITHM

[Time : 3:00 Hours]

[Max. Marks : 70]

I. Long Question : Answer Any Three

[10×3=30]

1. Find out the shortest path using Warshall's Algorithm for the following matrix?

W=

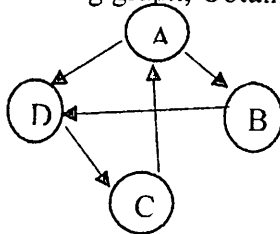
	A	B	C	D
A	3	0	0	4
B	4	5	0	0
C	0	2	3	0
D	0	0	1	4

2. Show the trace of the quick sort algorithm for the following data:
22,55,6,7,3,66,89,56,49,34,65,67.
3. Explain in brief the Binary search technique in array with an algorithm?
4. Discuss the heap sort method for sorting a list with an algorithm and the example given below:
23, 45,12,56,34,09,16,41,50, 77,44,67,82

II. Short Question: Answer any Five

[5×5=25]

1. For the following graph, Obtain adjacency matrix as well as the adjacency list representation



2. Consider a tree having Pre-Order and In-Order Traversal as follows? Draw a tree and write its post order traversal
In-Order –Z, A, Q, P, Y, X, C, B
Pre-Order –Q, A, Z, Y, P, C, Z, B
3. Explain selection sort in brief and explain its algorithm?
4. What is Stack? write its operation and algorithm?
5. What is Array with example? Write its operation.
6. Explain the Print algorithm in linked list?
7. Explain selection sort in brief and explain its algorithm?

[P.T.O.]

III. Objectives Question: Answer All Question

[15×1=15]

1. Which of these best describes an array?
a) A data structure that shows a hierarchical behavior b) Container of objects of similar types
c) Arrays are immutable once initialized d) Array is not a data structure
2. Which one of the following is the process of inserting an element in the stack?
a) Insert b) Add c) Push d) None of the above
3. If the size of the stack is 10 and we try to add the 11th element in the stack then the condition is known as
a) Underflow b) Garbage collection c) Overflow d) None of the above
Which of the following is the infix expression?
a) $A+B*C$ b) $+A*BC$ c) $ABC+*$ d) None of the above
5. What are the disadvantages of arrays?
a) Data structure like queue or stack cannot be implemented
b) There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size
c) Index value of an array can be negative d) Elements are sequentially accessed
6. Which of these is not an application of linked list?
a) To implement file systems b) For separate chaining in hash-tables
c) To implement non-binary trees d) Random Access of elements
7. Which of the following is false about a doubly linked list?
a) We can navigate in both the directions
b) It requires more space than a singly linked list
c) The insertion and deletion of a node take a bit longer
d) Implementing a doubly linked list is easier than singly linked list
8. Which of these is not an application of linked list?
a) To implement file systems b) For separate chaining in hash-tables
c) To implement non-binary trees d) Random Access of elements
9. Process of removing an element from stack is called
a) Create b) Push c) Evaluation d) Pop
10. What is the value of the postfix expression $6\ 3\ 2\ 4\ +\ -\ *?$
a) 1 b) 40 c) 74 d) -18
11. The process of accessing data stored in a serial access memory is similar to manipulating data on a
a) Heap b) Binary Tree c) Array d) Stack
12. The postfix form of $A*B+C/D$ is?
a) $*AB/CD+$ b) $AB*CD/+$ c) $A*BC+/D$ d) $ABCD+/*$
13. Which data structure is used for implementing recursion?
a) Queue b) Stack c) Array d) List
14. Which of the following properties is associated with a queue?
a) First In Last Out b) First In First Out c) Last In First Out d) Last In Last Out
15. The number of edges from the node to the deepest leaf is called of the tree.
a) Height b) Depth c) Length d) Width

Printing Pages : 1

Paper Code : BCSE- 402

(A) (SVSU:2022-2023/R)

ENROLLMENT NO.

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B.TECH. (CSE)

2ND YEAR, 4TH SEMESTER EXAMINATION
COMPUTER ORGANISATION AND ARCHITECTURE

[Time: 3:00 Hrs.]

Max. Marks:70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

- a) Differentiate between hardwired and micro programmed control unit.
- b) What are the major characteristics of a pipeline?
- c) What is a carry look-ahead adder?
- d) Differentiate SRAM and DRAM
- e) Define DMA controller.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- a) Explain memory hierarchy with description of semiconductor memory?
- b) What are the types of pipeline hazards?
- c) Explain Flags in 8086 microprocessor?
- d) Explain types of register in computer organization and architecture

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- a) Explain optimal page replacement algorithm with example?
- b) Write a note on the working of Micro programmed control unit design.
- c) What is the difference between implied and immediate addressing modes? Explain with an example.
- d) Describe cache memory with architecture? And describe all mapping function with suitable diagram.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- a) Calculate $17/4$ using division non-restoring
- b) How data hazard can be prevented in pipelining?
- c) What are the requirements satisfied by an instruction set? Also explain various types of instructions.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- a) Explain about the Various pipeline performance measures.
- b) Show the systemic multiplication process of $(20) \times (-19)$ using Booth's algorithm
- c) Give the main physical differences between the following memory technologies: SRAMs, flash memories and CD-ROM.?

Printing Pages : 1

Paper Code : - BECE- 306

(A) (SVSU) : 2023-2024/R

Enrollment No.

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B.TECH (CSE/IT)
II YEAR, III SEMESTER EXAMINATION
DIGITAL ELECTRONICS

[Time : 03:00 Hours]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

Q.1. Attempt any four parts of the following:

(4*3=12)

1. State De Morgan's theorem.
2. What is meant by Karnaugh map or K-Map method?
3. Define Half adder and full adder.
4. Difference between Combinational & Sequential Circuits.
5. What are the different types of flip-flop?
6. What is edge-triggered flip-flop?

Q.2. Attempt any four parts of the following:

(4*3=12)

1. What are the different types of shift registers?
2. Define sequential circuit?
3. Give the comparison between synchronous & Asynchronous counters
4. Steps or Design procedure for Synchronous Counter.
5. Explain EEPROM.

Q.3. Attempt any three parts of the following:

(3*6=18)

1. Differentiate volatile and non-volatile memory
2. Design and explain the working of a 4 x 1 MUX.
3. Realize the functions of NOT, AND, OR and NAND gates only with NOR gates.
4. Realise $F(A,B,C,D) = \sum m(0,3,4,5,8,9,10,14,15)$ using gates.

Q.4. Attempt any two parts of the following:

(2*7=14)

1. Implement the following function with a Multiplexer:- $f(a, b, c, d) = \sum (0, 1, 3, 4, 8, 9, 15)$
2. Explain the working of a master – slave JK flip flop. State its advantages.
3. Design a BCD Up / Down counter using S R flip-flops

Q.5. Attempt any two parts of the following:

(2*7=14)

1. Design a mod- 7 counter using JK flip-flops
2. Explain D and T flip flop.
3. Write short notes on Semi-conductor memory.

Enrollment No.

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B. TECH. (CSE/IT/ECE)
II YEAR, III SEMESTER EXAMINATION
MATHEMATICS – III

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4×3=12)

a)	Form PDE from the equation $z = x + y + f(xy)$ by eliminating the arbitrary function.
b)	Solve the following PDE:- $(D^2 + 3DD' + 2D'^2)u = x + y$.
c)	Solve the following PDE:- $(D^2 - DD' + D' - 1)z = \sin(x + 2y)$.
d)	Find the Laplace transform of $(e^{-t} \sin t)/t$.
e)	Discuss various difference operators.
f)	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3×4=12)

QUESTION NO. 2: (10 MARKS) PART THREE: (10 MARKS)

a)	Solve the following PDE:- $yzp - xzq = xy$.														
b)	Find the inverse Laplace transform of $\cot^{-1}(p+3/2)$.														
c)	Construct difference table for the following data: <table><tr><td>X</td><td>2.5</td><td>3.0</td><td>3.5</td><td>4.0</td><td>4.5</td><td>5.0</td></tr><tr><td>Y</td><td>24.145</td><td>22.043</td><td>20.225</td><td>18.644</td><td>17.262</td><td>16.047</td></tr></table>	X	2.5	3.0	3.5	4.0	4.5	5.0	Y	24.145	22.043	20.225	18.644	17.262	16.047
X	2.5	3.0	3.5	4.0	4.5	5.0									
Y	24.145	22.043	20.225	18.644	17.262	16.047									
d)	Find $y''(0)$ from the following data: <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>y</td><td>4</td><td>8</td><td>15</td><td>7</td><td>6</td><td>2</td></tr></table>	x	0	1	2	3	4	5	y	4	8	15	7	6	2
x	0	1	2	3	4	5									
y	4	8	15	7	6	2									

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3×6=18)

a)	Solve:- $x(y^2 - z^2)p + y(z^2 - x^2)q = z(x^2 - y^2)$.
b)	Solve:- $(D^3 - 7DD'^2 - 6D'^3)z = e^{3x+y} + \sin(x+2y)$.
c)	Find a root of the equation $xe^x = \cos x$ in the interval (0, 1) using Regula - Falsi method correct to four decimal places.
d)	Apply Runge-Kutta method of fourth order to solve the initial value problem: $5 \frac{dy}{dx} = x^2 + y^2$; $y(0) = 1$ and find y in the interval $0 \leq x \leq 0.2$ taking $h = 0.1$

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2×7=14)

a)	Solve the following PDE:- $px + qy = pq$.
b)	Solve:- $(D^2 - D'^2 - 3D + 3D')z = xy + e^{x+2y}$.
c)	Use convolution theorem to evaluate: $L^{-1}\{p/(p^2+4)^2\}$.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2×7=14)

QUESTION NO.-3: ATTEMPT ANY TWO PARTS.

a)	Using Laplace transform, solve the differential equation- $y'' + 2y' + 5y = e^{-t} \sin t$; $y(0) = 1$ and $y'(0) = 1$.										
b)	Using Lagrange's interpolation formula, find $f(9.5)$, given: <table><tr><td>x</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>F(x)</td><td>3</td><td>1</td><td>1</td><td>9</td></tr></table>	x	7	8	9	10	F(x)	3	1	1	9
x	7	8	9	10							
F(x)	3	1	1	9							
c)	Solve the following equations, by Gauss-Seidel method: $3x + 20y - z = -18$, $20x + y - 2z = 17$, $2x - 3y + 20z = 25$										
