

Enrollment No.

B.TECH (CSE)**COMPUTER SCIENCE & ENGINEERING****IIND YEAR IIIRD SEM EXAMINATION****ANALOG ELECTRONIC CIRCUITS [BECE-307]****[Time : 3:00 Hours]****[Max. Marks : 70]**

- 1 Answer Any Four** **[4×3=12]**
- Provide few applications of Switched Capacitor Circuit.
 - Draw Reverse biasing structure for pn junction diode.
 - Write a short note on current mirror circuit.
 - Define (i) Conductor (ii) Semiconductor (iii) Insulator.
 - Draw a neat diagram of Hartley oscillator circuit.
 - Define common mode rejection ratio
- 2 Answer Any Three** **[3×4=12]**
- Write about Barkhausen's criteria for oscillation.
 - What are the ideal characteristics of an Op-amp?
 - With a neat sketch describe VI characteristics of pn junction diode.
 - Write down the applications of an Oscillator.
- 3 Answer Any Three** **[3×6=18]**
- With a neat diagram explain Op-amp as an Integrator
 - With a neat diagram, explain working of R-C phase shift oscillator circuit designed with a BJT.
 - Compare between Flash type, Successive approximation type and Dual type ADC.
 - Explain npn and pnp transistor structure with diagrams.
- 4 Answer Any Two** **[2×7=14]**
- Explain in short about how Zener diode can act as a voltage regulator.
 - Explain the design detail about MOSFET with a neat diagram.
 - A 5 volt stabilized power supply is required to be produced from a 12 volt DC power supply input source. The maximum power rating P_z of zener diode is 2Watts. Using a standard Zener regulator concept, find out (i) Maximum current flowing through Zener diode. (ii) The value of resistor $R_s = 400\Omega$. (iii) The current load if load resistor of $1\text{ k}\Omega$ is connected across the Zener diode (iv) The Zener current I_z .
- 5 Answer Any Two** **[2×7=14]**
- Design and explain working of Flash type Analog to Digital Converter.
 - Prove that Switched capacitor circuit mimics the function of a resistor.
 - If CMRR is 100 dB, Input Common Mode Voltage is 12V and differential voltage gain is 4000 calculate output common mode voltage

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

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B. TECH. (CSE/IT)

**II YEAR, III SEMESTER EXAMINATION
DATA STRUCTURE AND ALGORITHMS**

[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)

- What is priority queue how it can be implemented in the data structure?
- Solve the given example of the infix to Postfix conversion
 $((A + B) - C * (D / E)) + F$
- What is Sparse Matrix? Describe a data structure for efficient storage of Sparse Matrix?
- What is asymptotic notation? Explain its types?
- Define AVL tree with suitable example.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- Write an algorithm/Program in C of the following with suitable example
 - Insertion
 - Selection
- Show the trace of the quick sort algorithm for the following data:
12,45,16,7,23,66,89,56,49,34,60,70
- Explain in brief the breadth first search technique with an algorithm?
- Explain the following with suitable example: -
 - Mid-Square Hashing
 - Division Remainder Hashing
 - Direct Hashing

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- Construct a B-tree of order 5 with inserting the elements
3, 14, 7, 1, 8, 5, 11, 17, 13, 6, 23, 12, 20, 26, 4, 16, 18, 24, 26, 19
- What is Stack, write its operation and algorithm?
- Give any two representations of graphs? What do you mean by in-degree and out-degree of a graph?
- What is Stack? Write its operation and algorithm?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Convert the following infix expression to postfix expression using Stack and show the details of stack of each step of the conversion
Expression: $-(a+b*c^d)*(e+f/g)$
- Write and explain the example of Warshall's algorithm?
- What is Binary Search Tree? How it is different from the Binary Tree? Write an algorithm for PREORDER, INORDER, POST-ORDER traversal of the tree?

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Explain queue with its operation and algorithm?
- Describe the linked list implementation of stack. Write all the primitive operations
- Explain Binary Search in array and explain its algorithm?

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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)	Define homogeneous and non-homogeneous linear partial differential equation with suitable examples
b)	Solve the following PDE:- $(D^3 - 3D^2D' + 4D'^3)u = e^{x+2y}$.
c)	Solve the following PDE:- $(DD' + aD + bD' + ab)z = e^{mx+ny}$.
d)	Evaluate:- $\int_0^\infty t^3 e^{-t} \sin t dt$.
e)	Discuss rate of convergence of bisection method.
f)	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson 1/3 rule.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3×4=12)

QUESTION NO. 2: ATTEMPT ANY THREE PARTS:

a)	Solve the following PDE:- $xp + yq = 3z$.										
b)	Find the inverse Laplace transform of $\log\left(1 + \frac{1}{p^2}\right)$										
c)	Using Lagrange's interpolation formula, find the polynomial of degree 2: <table><tr><td>x</td><td>1</td><td>3</td><td>4</td></tr><tr><td>F(x)</td><td>1</td><td>27</td><td>64</td></tr></table>	x	1	3	4	F(x)	1	27	64		
x	1	3	4								
F(x)	1	27	64								
d)	Find $y'(0)$ from the following data: <table><tr><td>x</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr><tr><td>y</td><td>0.9975</td><td>0.99</td><td>0.9776</td><td>0.9604</td></tr></table>	x	0.1	0.2	0.3	0.4	y	0.9975	0.99	0.9776	0.9604
x	0.1	0.2	0.3	0.4							
y	0.9975	0.99	0.9776	0.9604							

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3×6=18)

a)	Solve:- $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$.
b)	Solve:- $(D^2 + 3DD' - 4D'^2)z = x + \sin y$.
c)	Using Newton-Raphson method, find a real root of $\cos x = 3x - 1$, correct upto four decimal places.
d)	Given $\frac{dy}{dx} = y - x$, $y(0) = 2$, find $y(0.1)$ and $y(0.2)$ using Runge - Kutta method.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2×7=14)

a)	Solve the following PDE:- $pxy + pq + qy = yz$.
b)	Solve:- $(D - 3D' - 2)^3 z = 6e^{2x} \sin(3x+y)$.
c)	Use convolution theorem to evaluate: $L^{-1}\{p^2/(p^2+a^2)(p^2+b^2)\}$.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2×7=14)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

a)	Using Laplace transform, solve the differential equation- $y'' + 4y' + 4y = 6e^{-t}$; $y(0) = -2$ and $y'(0) = 8$.														
b)	Using Newton's divided difference interpolation formula, find the values of $f(8)$ and $f(15)$ from the following table: <table><tr><td>x</td><td>4</td><td>5</td><td>7</td><td>10</td><td>11</td><td>13</td></tr><tr><td>F(x)</td><td>48</td><td>100</td><td>294</td><td>900</td><td>1210</td><td>2028</td></tr></table>	x	4	5	7	10	11	13	F(x)	48	100	294	900	1210	2028
x	4	5	7	10	11	13									
F(x)	48	100	294	900	1210	2028									
c)	Solve the following equations, by Gauss-Seidel method: $10x + 15y + 3z = 14$ $-30x + y + 5z = 17$ $x + y + 4z = 3$														

[P.T.O.]

- c) Mod -4 counter
d) Mod - 7 counter
7. How many NAND and NOR gates are needed to implement NOT Gate?
a) 1
b) 4
c) 3
d) 2
8. VLSI stands for:
a) Very large scale integration
b) Ultra-very large scale integration
c) Small scale integration
d) Medium large scale integration
9. Find the octal equivalent of $(0.345)_{10}$:
a) $(0.3450)_8$
b) $(0.26050)_8$
c) $(2.4)_8$
d) $(91.44)_8$
10. Find the binary equivalent of $(3.45)_8$
a) $(011\ 111.100101)_2$
b) $(111\ 011.101100)_2$
c) $(011.100101)_2$
d) $(111.101100)_2$
- The canonical sum of product form of the function $y(A,B) = A + B$ is _____
a) $AB + BB + A'A$
b) $AB + AB' + A'B$
c) $BA + BA' + A'B'$
d) $AB' + A'B + A'B'$
11. Find the valid statement in terms of complement?
a) Complements are used in digital computer to simplify the subtraction operation.
b) The complement formula is $r^n - N$ where r is radix, n is no of digits and N is given number
c) The 1's complement of 1011 is 0100.
d) All the above
13. PAL architecture is
a) Programmable AND and Fixed OR
b) Programmable AND and Programmable OR
c) Fixed AND and Programmable OR
d) Fixed AND and Fixed OR
14. Which gate is equivalent to OR gate followed by Not Gate?
a) Ex-or
b) Ex-nor
c) AND
d) NOR
15. If there are two 5 bit binary number then how many full adder we require in parallel adder?
a) 5
b) 6
c) 2.5
d) 0

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B. TECH. (CSE/IT/CE)
II YEAR, III SEMESTER EXAMINATION
HUMANITIES-I
(EFFECTIVE TECHNICAL COMMUNICATION)

[Max. Marks : 70]

[Time : 3:00 Hours]

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

(4*3=12)

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

- a) What is Information Design?
- b) Define Effective Communication.
- c) Public speaking means _____
- d) What do you understand by Interview skills?
- e) What do you understand by Personality Development?
- f) Define a memorandum.

(3*4=12)

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

- a) What do you understand by self-development?
- b) Discuss the various types of speech delivery.
- c) What is report writing?
- d) Mention the names of the various types of interview.

(3*6=18)

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

- a) Describe the various types of report writing.
- b) Describe characteristics of effective communication.
- c) What do you understand by information development cycle?
- d) What is an organization structure? Comment on the significance of organization structure.

(2*7=14)

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

- a) Differentiate between online media and print media?
- b) Discuss any seven technical documents you have studied.
- c)
 - 1. **Fill in the blanks:**
 - i) **Antonym** of technical _____
 - ii) **Synonym** of unusual _____
 - 2. **Edit the underlined errors with correct option.**
 - i. The United Nations Organization was find in 1945 with the objective of averting another major world war.
 - ii. When you called I is work in the garden.
 - iii. What did you do with a stereo I gave you?
 - iv. Every nation has it customs and traditions.
 - v. Put a small quantity of sugar in the batter.

(2*7=14)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

- a) Comment on the dos and don'ts during a good group discussion
- b) What are the major dos and don'ts you should take care of during an interview?
- c) What do you understand by Presentation skills? How can you make a presentation effective?
