



BBDNIIT

BABU BANARASI DAS
NORTHERN INDIA INSTITUTE OF TECHNOLOGY, LUCKNOW
B. TECH.IInd YEAR (CSE) – FIRST SESSIONAL EXAMINATION
ACADEMIC SESSION 2023-24(ODD SEMESTER)

Date: Dec 07, 2023

Discrete Structures and Theory of Logic (BCS303)

Timing: 14:30 to 16:00

Max Marks: 30

NOTE: Attempt all sections

SECTION A

Q01. Attempt ALL questions in brief:

[06x01 =06]

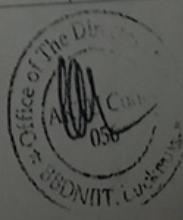
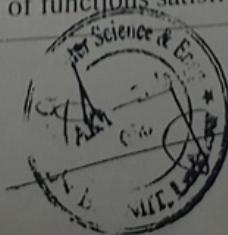
		Question	Marks	CO	BTL
1A		Show that $A \cap B = B \cap A$, where A and B are any set.	1	1	3
1B		Draw the Hasse diagram of (A, \leq) , where $A=\{3,4,12,24,48,72\}$ and relation \leq be such that $a \leq b$ if a divides b.	1	1	3
1C		Differentiate between equivalence relation and poset.	1	1	2
1D		Given two sets, $A=\{1, 2, 3, 4\}$ and $B=\{a, b, c, d\}$ and $f=\{(1, a), (2, a), (3, d), (4, c)\}$. Show that f is a function but f^{-1} is not a function.	1	2	3
1E		Define minterm and maxterm in Boolean algebra.	1	2	1
1F		State with proof Consensus theorem.	1	2	2

SECTION B

Attempt any TWO questions of the following:

[02x06 =12]

		Question	Marks	CO	BTL
2	A	Define the following- a. Modular lattice b. Bounded lattice c. Complete lattice	3	1	1
	B	If X and Y are two non-empty sets and $f:X \rightarrow Y$ is one-one and onto function then for any subsets A and B of Y, prove that a. If $A \subseteq B$ then $f^{-1}(A) \subseteq f^{-1}(B)$. b. $f^{-1}(A - B) = f^{-1}(A) - f^{-1}(B)$. c. $f^{-1}(Y - A) = X - f^{-1}(A)$.	3	2	3
3	A	Let A = {a,b,c,d} is defined by R = {(a,b), (b,c), (d,c), (d,a), (a,d), (d,d)}. Find out Reflexive, Symmetric and Transitive closure of R.	3	1	3
	B	Prove that the composition of functions satisfies the associative property.	3	2	3



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4	A	In a group of 100 students, 72 students can speak English and 43 students can speak Hindi. Based on these data, answer the following questions: a. Find the number of students who can speak English only. b. Find the number of students who can speak Hindi only. c. Find the number of students who can speak both English and Hindi.	3	1	3
	B	Simplify the given expression using K-map. $X = A'B'C' + A'B'C + A'BC + A'BC' + AB'C + ABC$	3	2	3

SECTION C

Q05. Attempt Any One of the Following:

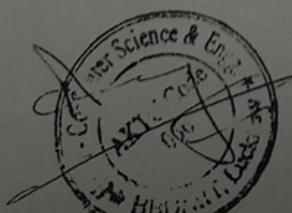
[01x06 =06]

Question			Marks	CO	BTL
5A	If R and S be two relation from A to B, then prove that-				
	a. If $R \subseteq S$ then $R^{-1} \subseteq S^{-1}$ b. $(R \cap S)^{-1} = R^{-1} \cap S^{-1}$ c. $(R \cup S)^{-1} = R^{-1} \cup S^{-1}$ d. $R \cap S$ is an equivalence relation if R and S are equivalence relations.	6	1	3	
5B	a. Differentiate between distributive and complemented lattice. In a distributive lattice, if an element has a complement then this complement is unique. b. Find the complement of each elements of D_{42} .	6	1	3	

Q 06. Attempt Any One of the Following:

[01x06 =06]

Question			Marks	CO	BTL
6A	a. Given three sets A, B and C are real number such that $A=B=C$. Consider the function $f: A \rightarrow B$ and $g: B \rightarrow C$ defined by $f(a) = 2a+1 \text{ and } g(b) = b/3.$ Prove that : $(gof)^{-1} = f^{-1} \circ g^{-1}$ b. Show that $n! = O(n^n)$ and $\log n! = O(n \log n)$	6	2	3	
6B	Let $B = \{1, 5, 7, 35\}$ be the set of positive integers and operation + and . are define as follows: $a+b = \text{lcm}(a, b), a.b = \text{gcd}(a, b) \text{ for all } a, b \in B.$ A unary operation ' on B is defined as $a' = 35/a \text{ for all } a \in B.$ Show that $(B, +, ., ')$ is a Boolean algebra.	6	2	3	





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NORTHERN INDIA INSTITUTE OF TECHNOLOGY, LUCKNOW
B.TECH.IInd YEAR - FIRST SESSIONAL EXAMINATION
ACADEMIC SESSION 2023-2024(ODD SEMESTER)**

UNIVERSAL HUMAN VALUES (BVE 301)

Timing: 2.30 P.M.-4.00 P.M

Max Marks: 30

Date: December 6, 2023

NOTE: Attempt all sections

Q01. Attempt ALL questions in brief:

SECTION A

[06x01 = 06]

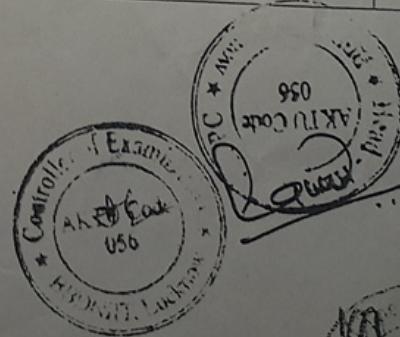
	Question	Marks	CO	BTL
1A	Define Self exploration	1	1	1
1B	Define Harmony	1	1	1
1C	Define Happiness	1	1	1
1D	Describe Prosperity	1	2	1
1E	What is Experiential Validation?	1	2	2
1F	What is Natural Acceptance?	1	2	1

SECTION B

Attempt any TWO questions of the following:

[02x06 = 12]

	Question	Marks	CO	BTL
2	A Critically examine the prevailing notions of happiness and prosperity in the society.	3	1	1
	B Differentiate the needs of Human being.	3	2	2
3	A Differentiate between 'animal consciousness' and 'human consciousness'	3	1	2
	B Give three needs of self and Body.	3	2	1
4	A What is the basic human aspiration? Describe.	3	1	1
	B Define Human Being.	3	2	1



SECTION C

Q05. Attempt Any One of the Following:

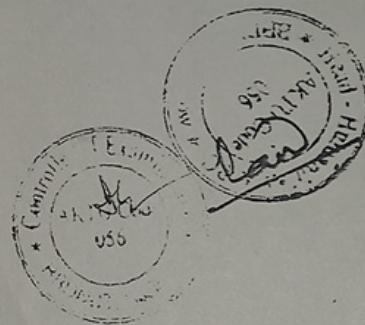
[01x06 =06]

	Question	Marks	CO	BTL
5A	Explain the need of value education in your own life?	6	1	1
5B	What is the main reason that one should go for self exploration?	6	1	1

Q 06. Attempt Any One of the Following:

[01x06 =06]

	Question	Marks	CO	BTL
6A	Describe the concept of Health and Control	6	2	2
6B	"Body acts as an instrument of self". Discuss.	6	2	1





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NORTHERN INDIA INSTITUTE OF TECHNOLOGY, LUCKNOW
B. TECH. 2nd YEAR (CSE) - FIRST SESSIONAL EXAMINATION
ACADEMIC SESSION 2023-24 (ODD SEMESTER)

Date: Dec, 07, 2023

COMPUTER ORGANIZATION AND ARCHITECTURE (BCS 302)

Timing: 10 - 11.30 am

Max Marks: 30

NOTE: Attempt all sections

Q01. Attempt ALL questions in brief:

SECTION A

[06x01 = 06]

	Question	Marks	CO	BTL
1A	Write the functions of Bus.	1	1	I
1B	What is the difference between Direct and In-direct addressing mode?	1	1	II
1C	List the advantages of Independent Request or Fixed Priority Method.	1	1	II
1D	Using 8-bit 2's complement representation of negative numbers, perform $35 + (-21)$	1	2	III
1E	Define mantissa overflow and underflow.	1	2	I
1F	What is the function of AR and DR?	1	2	II

SECTION B

Attempt any TWO questions of the following:

[02x06 = 12]

		Question	Marks	CO	BTL
2	A	Explain Von-Neumann architecture.	3	1	II
	B	Describe Carry Look-ahead adder.	3	2	II
3	A	What is Bus Arbitration? List the different types of Bus Arbitration.	3	1	I
	B	Explain IEEE standard for floating point representation. Represent -791.1258 in IEEE double Precision format.	3	2	II
4	A	Explain the concept of Stack Organization and write steps for PUSH and POP operation.	3	1	II
	B	Multiply (-7) with (3) by using Booth's multiplication.	3	2	IV

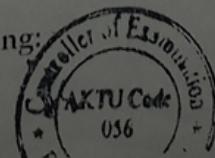
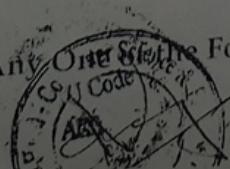
SECTION C

[01x06 = 06]

Q05. Attempt Any One of the Following:

	Question	Marks	CO	BTL
5A	List the various types of microoperations.	6	1	II
5B	Briefly discuss General register Organization with diagram.	6	1	II

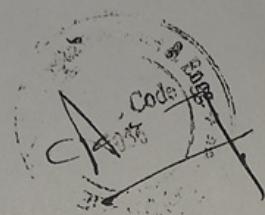
Q 06. Attempt Any One of the Following:



[01x06 = 06]

Question			Marks	CO	BTL
6A	Divide 11 by 2 using Booth division algorithm.		6	2	IV
6B	Draw and explain flowchart for floating point addition and subtraction.		6	2	II

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B. TECH. 2nd YEAR(CSE/IT/EE) – FIRST SESSIONAL EXAMINATION
ACADEMIC SESSION 2023-24(ODD SEMESTER)

Date: Dec 08, 2023

ELECTRONICS ENGINEERING (BOE309)

Timing: 10:00AM-11:30AM

Max Marks: 30

NOTE: Attempt all sections

Q01. Attempt ALL questions in brief:

SECTION A

[06x01 = 06]

Question	Marks	CO	BTL
1A What is a dopant in a semiconductor?	1	1	K1
1B What is Zener voltage?	1	1	K1
1C Write down the diode current equation for a p-n junction diode.	1	1	K1
1D A half wave rectifier has an input of 10V peak from step down transformer. Calculate dc load voltage.	1	2	K3
1E What is difference between positive and negative clipper?	1	2	K1
1F What is the value of rectification efficiency for full wave rectifier?	1	2	K1

SECTION B

Attempt any TWO questions of the following:

[02x06 = 12]

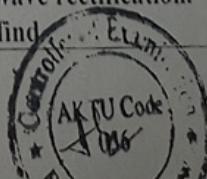
Question	Marks	CO	BTL	
2	A Explain avalanche breakdown.	3	1	K2
	B Draw negative clamper and explain its working along with waveforms.	3	2	K3
3	A Explain Zener breakdown	3	1	K2
	B Draw the parallel positive clipper and explain its operation along with waveforms.	3	2	K3
4	A Explain transition capacitance?	3	1	K2
	B Draw the series negative clipper and explain its operation along with waveforms.	3	2	K3

SECTION C

Q05. Attempt Any One of the Following:

[01x06 = 06]

Question	Marks	CO	BTL
5A Draw and explain the VI characteristics of diode?	6	1	K3
5B A crystal diode having internal resistance $r_f = 20\Omega$ is used for half-wave rectification. If the applied voltage $v = 50 \sin \omega t$ and load resistance $R_L = 800 \Omega$, find	6	1	K3



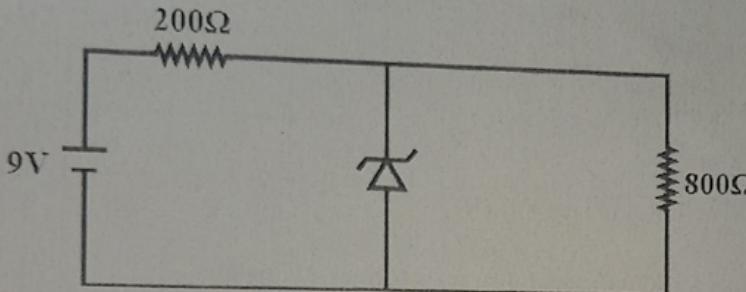
Sohail Riazat

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- (i) I_m , I_{de} , I_{rms} (ii) a.c. power input and d.c. power output
 (iii) d.c. output voltage (iv) efficiency of rectification.

Q 06. Attempt Any One of the Following:

[01x06 =06]

	Question	Marks	CO	BTL
6A	<p>Find the current through zener diode for the circuit shown in figure is: (Given: zener diode break down voltage $V_z=5.6V$)</p> 	6	2	K3
6B	Explain the working of a full wave bridge rectifier?	6	2	K2

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B. TECH. 2ND YEAR (CS&E) - FIRST SESSIONAL EXAMINATION
ACADEMIC SESSION 2023-24(ODD SEMESTER)

Date: Dec 08, 2023

NOTE: Attempt all sections

Data Structure (BCS 301)
Timing: 02:30-04:00

Max Marks: 30

Q01. Attempt ALL questions in brief:

SECTION A

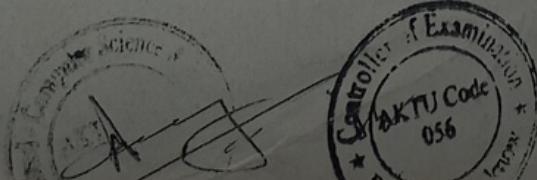
[06x01 =06]				
	Question	Marks	CO	BTL
1A	What are drawbacks of singly linked list? And how we can fix it.	1	1	2
1B	Define abstract data type with suitable examples.	1	1	1
1C	Briefly explain Sparse Matrix and use in your field.	1	1	2
1D	If the tower of Hanoi is operated on n=10 disks, calculate the total number of moves.	1	2	1
1E	Explain how we can achieve recursion with using stack?	1	2	1
1F	State the rules to be followed during infix to postfix conversions.	1	2	2

SECTION B

Attempt any TWO questions of the following:

[02x06 =12]

[02x06 =12]				
	Question	Marks	CO	BTL
2	A Write pseudo code to insert an element in a single link list at three different locations first, middle and last.	3	1	2
	B Convert the following infix expression into its equivalent postfix expression: A+(B*C-(D/E^F)*G)*H	3	2	4
3	A Explain the concept of implement polynomial by linked list. And write pseudo code to add two polynomial expressions.	3	1	3
	B Evaluate the postfix expression: 6, 2, 3, +, -, 3, 8, 2, /, +, *, 2, ^, 3, +	3	2	4
4	A What are the merits and demerits of array? Given two arrays of integers in ascending order, develop an algorithm to merge these arrays to form a third array sorted in ascending order	3	1	4
	B What is Tower of Hanoi problem? Explain solutions of Tower of Hanoi problem using proper tree representation where number of disks n= 3 and towers are A, B, C.	3	2	2



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SECTION C

Q05. Attempt Any One of the Following:

[01x06 =06]

Question			Marks	CO	BTL
5A	Each element of an array A[2,----,20][3,----,50] requires 4 bytes of storage. Base is 2000. Determine the location of A[10][10] when the array is stored as : (i) Row Major (ii) Column Major		6	1	4
5B	With diagram and pseudo code insert one node at the middle of the circular doubly linked list		6	1	2

Q06. Attempt Any One of the Following:

[01x06 =06]

Question			Marks	CO	BTL
6A	Convert the following postfix expression into its equivalent postfix expression: $ABC^*DEF^{\wedge}/G^* - H^*$		6	2	4
6B	Explain the concept of linear queue. State the problem with linear queue, also explain the solution to mitigate the problem		6	2	3





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B. TECH.IInd YEAR (CSE&ECE) – FIRST SESSIONAL EXAMINATION
ACADEMIC SESSION 2023-24(ODD SEMESTER)

Date: Dec 06, 2023

NOTE: Attempt all sections

Python Programming (BCC302)
Timing: 10:00AM to 11:30AM

Max Marks: 30

Q01. Attempt ALL questions in brief:

SECTION A

[06x01 =06]

	Question	Marks	CO	BTL
1A	Write down the features of python.	1	1	1
1B	List the versions of python with year of launch.	1	1	1
1C	Write five IDEs of python.	1	1	2
1D	What is sequence?	1	2	2
1E	Explain the range function.	1	2	2
1F	Write the syntax of for and while loop.	1	2	1

SECTION B

Attempt any TWO questions of the following:

[02x06 =12]

	Question	Marks	CO	BTL
2	A Explain data types used in python.	3	1	1
	B WAP in python to print following pattern: * ** *** ****	3	2	3
3	A Explain the type of statements used in python.	3	1	2
	B WAP in python to check if a entered number is prime or not.	3	2	3
4	A Explain the tokens in python.	3	1	1
	B WAP in python to compute the factorial of n.	3	2	3



SECTION C

Q05. Attempt Any One of the Following:

[01x06 =06]

Question		Marks	CO	BTL
5A	Explain any five libraries of python.	6	1	1
5B	What is expression? Explain types of expressions with example.	6	1	2

Q 06. Attempt Any One of the Following:

[01x06 =06]

Question		Marks	CO	BTL
6A	Explain selections and iterations.	6	2	2
6B	What is nested loop concept? Explain.	6	2	2

