12-12-24

Printing Pages : 1 Paper Code : - BCSE -402 (C) (SVSU) : 2023-2024/R

Enrollment No. | | | | | | | | | | | | | |

B.Tech (CSE/IT)
II YEAR, IV SEMESTER EXAMINATION
COMPUTER ORGANISATION AND ARCHITECTURE

[Time : 03:00 Hours] [Max. Marks : 70]

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

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS. (4*3=12)

a) What is meant by an instruction cycle? Describe its two phases?
b) Enlist the characteristics of third and fourth generation computers.
c) Explain the working of micro programmed control unit.
d) What is an Interrupt?
e) What is cache memory?
f) Explain types of register in computer organization and architecture?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS. (3*4=12)

a) What does memory hierarchy mean? What is its significance?
b) Explain the significance of cache memory in computer system
c) Differentiate characteristics of RISC and CISC systems
d) Draw and explain the block diagram of a simple computer with five functional units.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS. (3*6=18)

a) What are the parameters of a typical memory hierarchy system? Discuss with a neat sketch.
b) What is meant by addressing mode? Explain absolute and indirect addressing Modes with suitable examples.
c) What is a pipeline hazard? Also explain the types of pipelining hazards?
d) Explain DMA method of data transfer in detail.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS. (2*7=14)

a) Explain the process of binary division with the help of a suitable example.
b) Explain the following
   a) Memory mapped I/O
   b) I/O Registers
   c) Hardware Interrupts
c) Explain page replacement algorithms with suitable example?

QUESTION NO.-5: ATTEMPT ANY TWO PARTS. (2*7=14)

a) Explain Microprocessor Architecture 8086 with detail diagram?
b) What is instruction hazard? Explain in detail how to handle the instruction hazards in pipelining with relevant examples
c) Using BOOTHs algorithm multiply 12(Multiplicand) by 17(Multiplier), each no is represented by 6 bit?

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02-01-25

Printing Pages : 1 Paper Code : - BIT-301 (B) (SVSU) : 2023-2024/R

Enrollment No. | | | | | | | | | | | | | |

B.TECH (IT)
II YEAR, III SEMESTER EXAMINATION
OBJECT ORIENTED SYSTEM

[Time : 03:00 Hours] [Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS. (4*3=12)

a) Explain in brief the TOMCAT server?

b) Define Table tag and their attributes with an example

c) What is XML, DOM? How DOM parses the XML file?

d) Explain the web Development Strategies? With the help of diagram?Define Anchor tag with an example.

e) Explain in brief the TOMCAT server?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS. (3*4=12)

a) Define List Tag with an example.

b) What is Document Type Definition (DTD)?

c) Define JSP expression

d) What is AJAX? Write its example in HTML.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS. (3*6=18)

a) What is Document object model? Discuss the various DOM methods used with JavaScript.

b) What are the benefits of using styles compared with placing formatting directly into the text of the Web page?

c) Design a table in HTML to display the marks of 5 students for 3 subjects. Student name should be the row headings and subject name should be the column headings. Marks can be of your choice

d) What do you understand by web technologies? What is the difference between web server and web browser?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS. (2*7=14)

a) What is the difference between Java and JavaScript ?

b) Compare CGI and JavaScript.

c) Define Frameset, Frame Tag. Divide the web page into four equal parts each individual part displays different web page.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS. (2*7=14)

a) What do you understand by ASP ? What are its advantages and disadvantages? How ASP is different from ASP.net.

02-01-25

Printing Pages : 1 Paper Code : - BIT-301 (C) (SVSU) : 2023-2024/R

Enrollment No. | | | | | | | | | | | | | |

B.TECH (IT)
II YEAR, III SEMESTER EXAMINATION
OBJECT ORIENTED SYSTEM

[Time : 03:00 Hours] [Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS. (4*3=12)

a) What do you understand by classes and objects in OOP.
b) What is object oriented programming? How it is different from procedure-oriented programming? Explain its benefits?
c) What do you understand by polymorphism?
d) Explain characteristics of OOP: Data hiding and Encapsulation.
e) What do you understand by function over loading? Explain it.
f) Describe the features of data abstraction. What are the advantages of it?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS. (3*4=12)

a) Explain Unary Operator overloading using post increment ++ operator. Describe it with help of example.
b) What are templates in C++? Describe it with help of C++ program.
c) What is a friend function? Why is it required? Explain with an example.
d) What is purpose of Exception Handling in C++? Describe it with C++ program.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS. (3*6=18)

a) What is Virtual base class? When do we make class virtual? Describe it with help of C++ program.
b) What is a purpose constructor? How a constructor of base class is executed with help derived class constructors? Describe it.
c) Differentiate between static binding and dynamic binding? Describe dynamic binding with the help of C++ program.
d) Define Pure Virtual functions and abstract classes in OOP and Describe with help of C++ program.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS. (2*7=14)

a) Create a class Customer having various properties, CustCode, CustName, Address, Quantity of item purchased and Rate of item. Write a C++ program using feature of OOP to create a class Customer and calculate amount using formula Amount= Quantity x Rate. Initialize class variable with the help of constructor. Display output appropriate format.
b) Describe the role of constructor and destructor functions in a C++ class. Explain it with suitable example.
c) Describe operator overloading. Write a C++ program to add two complex number using operator overloading by + operator.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS. (2*7=14)

a) Create a class Employee having various properties, EmpCode, EmpName, Department, Address and Basic Salary. Write a C++ program using feature of OOP to create a class employee and calculate HRA (House Rent Allowance), DA (Daily Allowance), TA (Travelling Allowance) and NetPay as given HRA is 30% of Basic Salary, DA is 70% of Basic Salary, TA is 10% of Basic Salary and NetPay = Basic Salary + HRA+ DA+MA. Display output appropriate format.
b) Describe Visibility of inherited members in OOP. Explain base class visibility and derived class visibility for private, public and protected members.
c) Explain different types of inheritance with block diagram and write a C++ program to explain Multi level inheritance.

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01/01/25

Printing Pages : 1 Paper Code : BECE-307 (B) (SVSU): 2022-2023/R

Enrollment No. | | | | | | | | | | | | | |

B. TECH. (CSE)
II YEAR, III SEMESTER EXAMINATION
ANALOG ELECTRONIC CIRCUITS

[Time : 3:00 Hours] [Max. Marks : 70]

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

1 Answer Any Four [4×3=12]

a. Write in brief on current mirror circuit.
b. Explain Barkhausen's criteria for oscillation.
c. Explain common mode rejection ratio.
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]

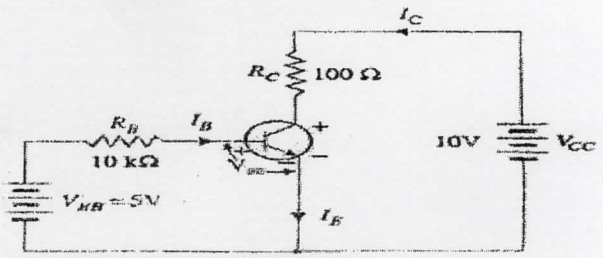
a. Write down ideal characteristics of an Op-amp
b. Compare between Successive approximation type and Dual type ADC.
c. Find out Maximum value of a signal to noise ratio of an 8 bit ADC with I/P range of 10 volt.
d. Describe a Bipolar Junction transistor circuit with a neat sketch.

3. Answer Any Three [3×6=18]

a. With a neat sketch describe VI characteristics of PN junction diode.
b. With a neat diagram explain Op-amp as a Differentiator.
c. With a neat diagram, explain working of Wien bridge circuit designed with a BJT.
d. Compare the basic differences between Analog signals and Digital signals.

4. Answer Any Two [2x7=14]

a. Prove that Switched capacitor circuit mimics the function of a resistor.
b. Explain in short about how Zener diode can act as a voltage regulator.
c.



In the Silicon transistor above, find VCB for ß=150

5. Answer Any Two [2x7=14]

a. If CMRR is 100 dB, Input Common Mode Voltage is 12v and differential voltage gain is 4000 calculate output common mode voltage .
b. Design and explain working of R2R Ladder type Digital to Analog Converter.
c. Compare between CB, CC and CE mode of Transistors.

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30-12-24

Printing Pages : 2 Paper Code : - KCSE-301 (C) (SVSU) : 2024-2025/R

Enrollment No. | | | | | | | | | | | | | |

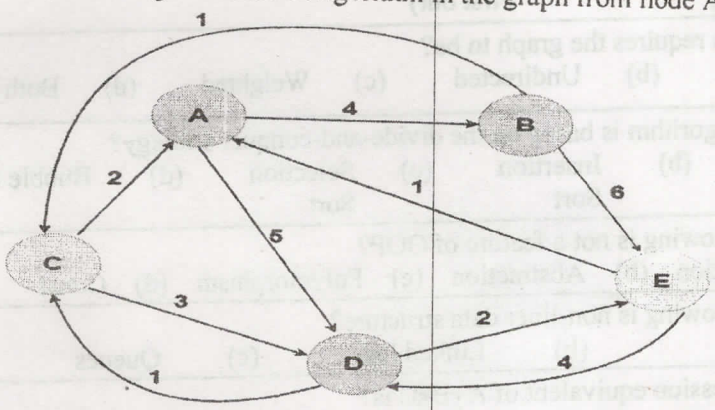
B.TECH. (CSE (AIML) /IT)
II YEAR, III SEMESTER EXAMINATION
DATA STRUCTURE USING C++

[Time : 03:00 Hours] [Max. Marks : 70]

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

1.	Multiple Choice Questions (MCQs) [01×15=15]
I	Which matrix has most of the elements (not all) as Zero? (a) Identity Matrix (b) Unit Matrix (c) Sparse Matrix (d) Zero Matrix
II	A graph in which all vertices have equal degree is known as? (a) Complete graph (b) Regular graph (c) Multi graph (d) Simple graph
III	Depth-first search uses? (a) Queue (b) Stack (c) Array (d) Hash Table
IV	Binary search can only be applied on? (a) Unsorted arrays (b) Sorted arrays (c) Strings (d) None
V	Which form of access is used to add and remove nodes from a queue? (a) LIFO (Last in First out) (b) FIFO (First in First out) (c) Both (d) None
VI	Prim's algorithm requires the graph to be? (a) Directed (b) Undirected (c) Weighted (d) Both (b) and (c)
VII	Which sorting algorithm is based on the divide-and-conquer strategy? (a) Quick Sort (b) Insertion Sort (c) Selection Sort (d) Bubble Sort
VIII	Which of the following is not a feature of OOP? (a) Encapsulation (b) Abstraction (c) Polymorphism (d) Const
IX	Which of the following is non-liner data structure? (a) Stack (b) Linked list (c) Queues (d) Tree
X	The postfix expression equivalent of A+B*C is? (a) AB+C* (b) ABC+* (c) ABC*+ (d) A+BC*
XI	Process of removing an element from stack is called? (a) Create (b) Push (c) Pop (d) Delete
XII	What is the height of a complete binary tree with 31 nodes? (a) 4 (b) 5 (c) 6 (d) 31
XIII	A Huffman Tree is used for? (a) Searching elements (b) Sorting elements (c) Data compression (d) Balancing a binary search tree
XIV	AVL Trees are? (a) Balanced binary search trees (b) Unbalanced binary search trees (c) Trees optimized for traversal (d) Trees optimized for insertion
XV	Breadth-first search uses? (a) Stack (b) Queue (c) Tree (d) None

[P.T.O.]

2.	**Answer in long (any three)**	**[10×3=30]**
I	(a) Explain with example all the recursive traversal algorithms of binary tree? (b) Given the preorder and inorder traversals of a binary tree, construct and return the binary tree. **In-order** : E,A,C,K,F,H,D,B,G **Pre-order**: F,A,E,K,C,D,H,G,B	
II	(a) What is Queue? Explain its operations with algorithm or C++ function. (b) Convert the following infix expression to postfix expression using Stack and show the details of stack of each step of the conversion **A * (B + C / D) - E**	
III	(a) Write an algorithm of Huffman coding. (b) Construct the Huffman Tree for the given sequence of characters with its frequency and also determine the code for each character **Character Frequency** a 5 b 9 c 12 d 13 e 16 f 45	
IV	(a) What is Graph? Explain any two types of graphs with example. (b) Find out the shortest path using Warshall's Algorithm in the graph from node A to node E. 	

3.	**Answer in short (any five)**	**[5x5=25]**
I	Draw a binary search tree for the following data: 15, 10, 20, 8, 12, 18, 25.	
II	Implement the radix sort algorithm to sort the numbers [170, 145, 175, 290, 802, 245, 402, 666].	
III	What is Data Structure? Explain its operations and types.	
IV	Evaluate the postfix expression **(5 3 4 + * 2 -)** using a stack	
V	Explain Input/Output streams (cin and cout) in C++ with example..	
VI	Write an algorithm or C++ function to insert node at the beginning of linked list.	
VII	Construct a B-tree of order 3 for the following data: 10, 20, 5, 6, 12, 30, 7, 17.	

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30-12-24

Printing Pages : 1 **Paper Code : BCSE-301** **(B) (SVSU): 2022-2023/R**

Enrollment No. | | | | | | | | | | | | | |

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)

a) Define Data Structure. Explain its operations and types.
b) Explain the print algorithm in linked list?
c) What is Sparse matrices in Brief?
d) What is linked list, write down the print algorithm for linked list?
e) Differentiate between overflow and underflow situation of the linked list?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS. (3*4=12)

a) Consider a B- tree having 22,55,6,7,3,66,89,56,49,34,65,67 insert an element 13 and 52 in tree.
b) Differentiate between DFS and BFS Searching Techniques?
c) Conversion postfix to infix
abc-+de-fg-h+/*
d) Write an algorithm for searching of an element in array using linked list?

QUESTION NO.-3: ATTEMPTANY THREE PARTS. (3*6=18)

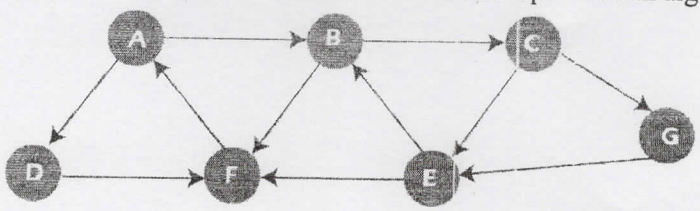
a) Explain array with example and its algorithm?
b) What is Binary Search Tree? How it is different forms the Binary Tree? Write an algorithm for PREORDER, INORDER, POST ORDER traversal of the tree?
c) What is Queue? Write its operation and algorithm?
d) What is a Binary Search Tree (BST)? Show the structure of the binary search tree after adding each of the following values in that order: 10, 25, 2, 4, 7, 13, 11, 22. What is the height of the created binary search tree?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS. (2*7=14)

a) What is Stack? Write its operation and algorithm?
b) Explain selection sort in brief and explain its algorithm?
c) Write an algorithm for insertion of an element in double circular linked list?

QUESTION NO.-5: ATTEMPT ANY TWO PARTS. (2*7=14)

(a) Explain in brief the breadth first search technique with an algorithm?



Adjacency Lists

A : B, D
B : C, F
C : E, G
G : E
E : B, F
F : A
D : F

(b) How can a quick sort if implemented in array? Write an algorithm for quick sort with an example?

(c) Explain AVL tree with suitable example and describe all the rotations in brief.

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24-12-24

Printing Pages : 1

Paper Code : KOE- 302

(B) SVSU 2024-25/R

Enrollment No. | | | | | | | | | | | | | |

COURSE NAME (Branch)- B.TECH (CSE/FT)
II YEAR/ III SEM. EXAMINATION
SUBJECT NAME: AUTOMATION AND ROBOTICS

[Time: 3:00 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. Define different types of transfer line and analysis of automated flow line. Also explain the quantitative analysis of assembly system.
2. What is Robotics? Explain Robot vision and different component of Robots also explain Geometric classification of Robot.
3. Sketch and explain the Three basic robot configurations classified according to the coordinate system
4. Explain the different types of electrical servo motors used in robot actuation.
5. Define degrees of freedom of a robot.
6. What do you mean Automation? Explain type of automation.

Q.2. Attempt any four parts of the following: **(4*3=12)**

1. Explain the role of PLC in automation?
2. Describe Fluid power system and Mechatronics with diagram.
3. Distinguish between Hydraulic and Pneumatic system.
4. What is the Role of Programmable automation in Manufacturing?
5. Explain the Robot configuration and Robot joints with neat diagram?

Q.3. Attempt any three parts of the following: **(3*6=18)**

1. Explain about forward kinematics transformation RR robot of 2 DOF with a neat sketch.
2. Mention the safety precautions for robot operation
3. Explain any two commands used in Robot programming.
4. Explain forward and inverse kinematics?

Q.4. Attempt any two parts of the following: **(2*7=14)**

1. Define Manipulator kinematics.
2. Differentiate between joint and link.
3. What is trajectory planning?

Q.5. Attempt any two parts of the following: **(2*7=14)**

1. Explain VAL programming commands.
2. Explain the applications of industrial robots in manufacturing area.
3. Explain teach pendant method of robot programming.

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24-12-24

Printing Pages : 1 **Paper Code : - BAS-302** **(A) (SVSU) : 2023-2024/R**

Enrollment No. | | | | | | | | | | | | | |

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

[Time : 03:00 Hours] **[Max. Marks : 70]**

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS. NON – PROGRANNABLE SCIENTIFIC CALCULATERS ARE ALLOWED.

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)

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:

x	1	3	4
F(x)	1	27	64

d)	Find $y'(0)$ from the following data:

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:- $x(y^2 + z)p - y(x^2 + z)q = z(x^2 - y^2)$.
b)	Solve:- $(D^2 - 6DD' + 9D'^2)z = 12x^2 + 36xy$.
c)	Using bisection method, find a real root of $x \log_{10} x = 1.2$, correct upto four decimal places.
d)	Find y (0.1) using modified Euler's method, given that $\frac{dy}{dx} = \log(x + y), y(0) = 1$.

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)

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:

x	7	8	9	10
F(x)	3	1	1	9

c)	Solve the following equations, by Gauss Siedal method: $3x + 20y - z = -18,\ 20x + y - 2z = 17,\ 2x - 3y + 20z = 25$

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18-12-24

Printing Pages : 1 **Paper Code : - KCSE-303** **(C) (SVSU) : 2024-2025/R**

Enrollment No. | | | | | | | | | | | | | |

B.TECH. (CSE/IT/AI-ML)
II YEAR, III SEMESTER EXAMINATION
DISCRETE STRUCTURE AND THEORY OF LOGIC

[Time : 03:00 Hours] **[Max. Marks : 70]**

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

QUESTION NO.-1: ATTEMPT ANY ***FOUR*** PARTS. (4×3=12)

a)	Show that the poset ({1,3,6,12,24},/) is a lattice.
b)	Prove that the function f : R → R be defined by f (x) = 4x – 1, ∀ x ∈ R. Then, show that f is one-one onto.
c)	Prove that the identity element of a group is unique.
d)	Find the disjunctive normal form of the following functions F(x,y,z)=$\{(x' + y') + (y + z')'\}' + yz$
e)	Show that dual of a complete lattice is complete.
f)	Define the degree of a vertex, isolated and pendant vertex.

QUESTION NO.-2: ATTEMPT ANY ***THREE*** PARTS. (3×4=12)

a)	Find the number of different outcomes of rolling three dice.
b)	Justify that "If f:A→B and g:B→C be one-to-one onto functions,then gof is also one to one onto and $(gof)^{-1} = f^{-1} o\ g^{-1}$".
c)	If p, q, r, a, b are elements of a Boolean Algebra then prove that (i) pqr + pqr' + pq'r + p' qr = pq + qr + rp (ii) ab + a b' + a' b + a' b' = 1
d)	In a group (G, *) prove that I) $(a^{-1})^{-1} = a$ II) $(ab)^{-1} = b^{-1}a^{-1}$

QUESTION NO.-3: ATTEMPTANY ***THREE*** PARTS. (3×6=18)

a)	Construct truth table for the following functions and check whether it is tautology or contradiction.$[(p \wedge q) \Rightarrow p] \Rightarrow (q \wedge \sim q)$
b)	Prove that the set $\{1, \omega, \omega^2\}$ is an abelian group under the composition multiplication also find the order of each element of group
c)	Determine whether the relation $S = \{(a, b): a \geq b\}$ on the set R of real numbers is an equivalence relation.
d)	Prove that every field is an integral domain.

QUESTION NO.-4: ATTEMPT ANY ***TWO*** PARTS. (2×7=14)

a)	State and prove Lagrange's theorem for group.
b)	Determine whether the relation $S = \{(a, b): a \leq b\}$ on the set R of real numbers is a partial order relation.
c)	How many positive integers not exceeding 500 are divisible by 7 or 11?

QUESTION NO.-5: ATTEMPT ANY ***TWO*** PARTS. (2×7=14)

a)	Prove that a necessary and sufficient condition for a non-empty subset H of G to be a subgroup is that $a \epsilon H, b \epsilon H \rightarrow ab^{-1} \epsilon H$
b)	Define complemented lattice and then show that in a distributive lattice, if an element has a complement then this complement is unique.
c)	Explain the following terms with example: i. Graph coloring and chromatic number. ii. Draw $K_{3,3}$ graph. iii Isomorphic Graph and Hamiltonian graph.

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