

J.B. INSTITUTE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)



ACADEMIC YEAR

2015 - 2016



COURSE PLAN

2015-16


Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
Designation: **Asst.prof**
Department:: **IT**

COURSE DETAILS

Name Of The Programme:: **B.Tech** Batch::**2015-2016**
Designation::
YearII SemesterI
Department:: **IT**
Title of The Subject **Mathamatical** Subject code**1412302**
Foundation of
Computer Science
No of Students **51**

	<p>COURSE PLAN</p>	<p>2015-16</p>
		<p>Regulation: R14</p>

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
 Designation: **Asst.prof**
 Department:: **IT**

1. TARGET

- a) Percentage Pass **100**
- b) Percentage I class **>95**

2. COURSE PLAN

(Please write how you intend to cover the contents: i.e., coverage of Units by lectures, guest lectures, design exercises, solving numerical problems, demonstration of models, model preparation, or by assignments, etc.)

3. METHOD OF EVALUATION

- 3.1. Continuous Assessment Examinations (CAE 1, CAE 2)
- 3.2. Assignments / Seminars
- 3.3. Mini Projects
- 3.4. Quiz
- 3.5. Term End Examination
- 3.6. Others

4. List out any new topic(s) or any innovation you would like to introduce in teaching the subject in this Semester.

Signature of HOD
 Date:

Signature of Faculty
 Date:



GUIDELINES TO STUDY THE SUBJECT

2015-16

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**

Designation: **Asst.prof**

Department:: **IT**

Guidelines for Preparing the Course: **Mathamatical Foundation of Computer Science**

Course Description:

You learn the fundamental concepts in mathematics. It can be used by the students in computer science as an introduction to the underlying ideas of mathematics for computer science. It explains topics like mathematical logic, predicates, relations, functions, combinatorics, algebraic structures and graph theory

Course Objectives:

- 1. You learn about Introduction to MFCS**
- 2. You learn about Introduction to Predicates**
- 3. You learn about binary relations**
- 4. You learn about Algebraic systems**
- 5. You learn about Introduction to Elementary Combinatorics**
- 6. You learn about Introduction to Recurrence Relation**
- 7. You learn about Introduction to Graph Theory**
- 8. You learn about Graph theory and applications**

Learning Outcomes:

At the end of the this course the student will known the truth tables,rules of inferences ,relations and combinations and graphs



COURSE OBJECTIVES

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
 Designation: **Asst.prof**
 Department:: **IT**

On completion of this Subject / Course the student shall be able to:

S.No.	Objectives	Outcomes
1.	Mathematical Logic: Statements and notations, connectives, well formed formulas, truth tables, tautology, Equivalence implication, normal forms, Quantifiers, universal quantifiers. Introduction to Predicates: Predicative logic, Free and bound variables, Rules of inference, Consistency, Proof of contradiction, Automatic theorem proving.	
2.	Properties of binary relations, Equivalence ,transitive closure, Compatibility and partial ordering relations, Lattices , Hasse diagram, Inverse function composition of functions, Recursive functions, Lattice and its properties, Algebraic Structures: Algebraic systems examples and general properties, Semi groups and monads, Groups sub groups' homomorphism, Isomorphism.	
3.	Introduction to Elementary Combinatorics: Basis of Counting With repetitions, Constrained repetitions, Binomial Coefficients, Binomial multinomial theorems, The principles of inclusion – Exclusion, Pigeon hole principles and its applications.	
4.	Recurrence Relation: Generating functions, function of sequences, Calculating coefficient of generating function, Recurrence Relation, Solving recurrence relation by substitution and generating funds, Characteristics roots solution of In homogeneous recurrence relation.	
5.	Graph Theory: Representation of Graph,DFS,BFS,spanning tree,planar graphraph theory and applications, Basic concepts Isomorphism and sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic numbers	

Text Books (TB)

TB1: Elements of DISCRETE MATHEMATICS- A computer oriented Approach-CLLiu, DP Mohapatra,Third Edition,Tata McGrawHill .

TB2:. Discrete Mathematics by RK Bisht, HS Dhami, Oxford University Press.

Suggested / Reference Books (RB)
<p>RB1: Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A.Kandel, T.P.Baker, PHI..</p> <p>RB2: Discrete and Combinational Mathematics-An Applied Introduction-5th Edition – Ralph. P.Grimaldi,Pearson Education.</p> <p>RB3: Discrete Mathematics and its applications, Kenneth H.Rosen,Fifth Edition,TMH.</p>

**Signature of Faculty
Date:**

Note: For each of the OBJECTIVE indicate the appropriate OUTCOMES to be achieved.
Kindly refer Page 16, to know the illustrative verbs that can be used to state the objectives.



COURSE OUTCOMES

2015-16

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
 Designation: **Asst.prof**
 Department: **IT**

The expected outcomes of the Course / Subject are:

S.No.	General Categories of Outcomes	Specific Outcomes of the Course
A.	An ability to apply knowledge of mathematics, science, and engineering	
B.	An ability to design and conduct experiments, as well as to analyze and interpret data	
C.	An ability to design a system, component, or process to meet desired needs within realistic Constraints such as economic, environmental, social, political, ethical, health and safety, Manufacturability and sustainability	
D.	An ability to function on multi-disciplinary teams	
E.	An ability to identify, formulate, and solve engineering problems	
F.	An understanding of professional and ethical responsibility	
G.	An ability to communicate effectively	
H.	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
I.	A recognition of the need for, and an ability to engage in life-long learning	
J.	A knowledge of contemporary issues	
K.	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

Objectives – Outcome Relationship Matrix (Indicate the relationships by mark).

Objectives \ Outcomes	A	B	C	D	E	F	G	H	I	J	K
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



COURSE SCHEDULE

2015-16

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
Designation: **Asst.prof**
Department:: **IT**

The Schedule for the whole Course / Subject is:: **MFCS**

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	Mathematical Logic: Statements and notations, connectives, well formed formulas, truth tables, tautology ,Equivalence implication , normal forms, Predicative logic, Free and bound variables, Rules of inference,	29/6/15	17/7/15	15
	Consistency, Proof of contradiction, Automatic theorem proving			
2.	Relations: Properties of binary relations Equivalence ,transitive closure, Compatibility and partial ordering relations, Lattices , Hasse diagram, Inverse function composition of functions, Recursive functions, Lattice and its properties			

	Algebraic systems examples and general properties Semi groups and monads, Groups sub groups' homomorphism, Isomorphism.	20/7/15	14/8/15	18
3.	Introduction to Elementary Combinatorics : Basis of Counting With repetitions, Constrained repetitions Binomial Coefficients, Binomial multinomial theorems, The principles of inclusion – Exclusion, Pigeon hole principles and its applications	18/8/15	9/9/15	14
4.	Introduction to Recurrence Relation Generating functions, function of sequences, Calculating coefficient of generating function, Recurrence Relation, Solving recurrence relation by substitution and generating funds, Characteristics roots solution of In homogeneous recurrence relation.	10/9/15	24/9/15	11
5.	Introduction to Graph Theory, Representation of Graph,DFS,BFS,spanning tree,planar graph			
	Graph theory and applications, Basic concepts Isomorphism and sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic numbers	25/9/15	22/10/15	10

Total No. of Instructional periods available for
the course:**68/68**

**SCHEDULE OF INSTRUCTIONS**

2015-16

UNIT - I

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**Designation: **Asst.prof**Department:: **IT**The Schedule for the whole Course / Subject is:: **MFCS**

Sl. No.	Date	No. of Periods	Topics / Sub - Topics	Objectives & Outcome Nos.	References (Text Book, Journal...) Page No. to
1	29/6/15	1	Introduction to MFCS	1&1	H.S.Dhami
2	30/6/15	2	Statements and notations	1& 1	H.S.Dhami
3	2/7/15	3	Well formed formulas, connectives	1& 1	H.S.Dhami
4	4/7/15	5	Truth tables and examples Tautology, contradiction with example	1&2	H.S.Dhami
5	6/7/15	6,7	Equivalence implication	1&1	H.S.Dhami
6	9/7/15	8	normal forms	1&1	H.S.Dhami
10	10/7/15	9	Quantifiers, universal quantifiers.	1&1	H.S.Dhami
11	13/7/15	10	Predicate Logic	1&1	H.S.Dhami
12	14/7/15	11	Free and Bound Variables	1&1	H.S.Dhami
13	16/7/15	12	Rules of Inference	1&1	H.S.Dhami
14	17/7/15	13	Consistency	1&1	H.S.Dhami
15		14	Proof of Contradiction	1&1	H.S.Dhami
16		15	Automata Theorem Proving	1&1	H.S.Dhami

Signature of Faculty

- Note: 1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED **BOLDLY**.
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.
-

**SCHEDULE OF INSTRUCTIONS**

2015-16

UNIT - II

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
Designation: **Asst.prof**
Department: **IT**

The Schedule for the whole Course / Subject is:: **MFCS**

Sl. No.	Date	No. of Periods	Topics / Sub - Topics	Objectives & Outcome Nos.	References (Text Book, Journal...) Page No. to
1	20/7/15	16	Introduction to Relations	1&1	H.S.Dhami
2	21/7/15	17	Properties of Binary Relations	1&1	H.S.Dhami
3	23/7/15	18	Equivalence Relation with examples	1&1	H.S.Dhami
4	24/7/15	19	Transitive Closure	1&1	H.S.Dhami
5		20	Compatibility Relation with examples		
6	25/7/15	21	Lattices	1&1	H.S.Dhami
7	28/7/15	22	Hasse Diagrams with examples		
8	29/7/15	23	Introduction to Functions	1&1	H.S.Dhami
9	30/7/15	24	Composition of functions		
10	31/7/15	25	Recursive functions	1&1	H.S.Dhami
11	01/8/15	26	Algebraic System examples	1&1	H.S.Dhami
12	04/8/15	27	General Properties	1&1	H.S.Dhami
13	05/7/15	28	Semi Groups		

14	06/8/15	29	Monads		H.S.Dhami
15	07/8/15	30	Groups, Subgroups		H.S.Dhami
16	08/8/15	31	Homomorphism, Isomorphism		H.S.Dhami
17	13/8/15	32	Revision on 2 nd unit		H.S.Dhami

Signature of Faculty

Date

Note: 1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.

2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED **BOLDLY**.

MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.



SCHEDULE OF INSTRUCTIONS

2015-16

UNIT - III

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**

Designation: **Asst.prof**

Department: **IT**

The Schedule for the whole Course / Subject is:: **MFCS**

Sl. No.	Date	No. of Periods	Topics / Sub - Topics	Objectives & Outcome Nos.	References (Text Book, Journal...) Page No ___ to ___
1	18/8/15	33	Introduction to Elementary Combinatorics	1&1	H.S.Dhami
2	19/8/15	34	Basis of Counting	1&1	H.S.Dhami
3	20/8/15	35	Combinations	1&1	H.S.Dhami
4	21/8/15	36	Permutations relation	1&1	H.S.Dhami
5	22/8/15	37	Combinations with Repetitions	1&1	H.S.Dhami
6		38	Permutations with Repetitions		H.S.Dhami
7		39	Constrained Repetitions		H.S.Dhami
8	01/9/15	40	Binomial Coefficients	1&1	H.S.Dhami
9	02/9/15	41	Multinomial Theorem	1&1	H.S.Dhami
10	03/9/15	42	The Principle of Inclusion and Exclusion	1&1	H.S.Dhami
11	04/9/15	43	Examples	1&1	H.S.Dhami
12	05/9/15	44	Pigeon Hole Principle	1&1	H.S.Dhami
13	08/9/15	45	Applications		H.S.Dhami

14	09/9/15	46	Revision		H.S.Dhami

Signature of Faculty
Date

- Note: 1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED **BOLDLY**.
-

MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.



SCHEDULE OF INSTRUCTIONS

2015-16

UNIT - IV

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**

Designation: **Asst.prof**

Department: **IT**

The Schedule for the whole Course / Subject is:: **MFCS**

Sl. No.	Date	No. of Periods	Topics / Sub - Topics	Objectives & Outcome Nos.	References (Text Book, Journal...) Page No. to
1	10/9/15	47	Introduction to Recurrence Relation		H.S.Dhami
2	11/9/15	48	Generating Functions	1&1	H.S.Dhami
3	12/9/15	49	Functions of Sequence	1&1	H.S.Dhami
4	15/9/15	50	Calculating Coefficient of Generating Function	1&1	H.S.Dhami
5	16/9/15	51	Recurrence Relations	1&1	H.S.Dhami
6	17/9/15	52	Solving Recurrence Relation by substitution	1&1	H.S.Dhami
7	18/9/15	53	Generating funds	1&1	H.S.Dhami
8	19/9/15	54	Characteristics roots examples	1&1	H.S.Dhami
9	22/9/15	55	Characteristics roots solution of In homogeneous Recurrence Relation		
10	23/9/15	56	Examples problems and quiz		
11	24/9/15	57	Revision		

Signature of Faculty

Date

2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED **BOLDLY**.
MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.



SCHEDULE OF INSTRUCTIONS

2015-16

UNIT - V

Regulation: R14

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**
 Designation: **Asst.prof**
 Department: **IT**

The Schedule for the whole Course / Subject is:: **MFCS**


Sl. No.	Date	No. of Periods	Topics / Sub - Topics	Objectives & Outcome Nos.	References (Text Book, Journal...) Page No ___ to ___
1	25/9/15	34	Introduction to Graph Theory	1&1	H.S.Dhami
2	30/9/15	35	Representation of Graphs	1&1	H.S.Dhami
3	1/10/15	36	DFS	1&1	H.S.Dhami
4	3/10/15	37	BFS	1&1	H.S.Dhami
5	6/10/15	38	Spanning Tree	1&1	H.S.Dhami
6	7/10/15	39	Planar Graphs	1&1	H.S.Dhami
7	8/10/15	40	Graph Theory	1&1	H.S.Dhami
8	9/10/15	41,42	Applications	1&1	H.S.Dhami
9	10/10/15	43,44	Basic Concepts Isomorphism	1&1	H.S.Dhami
10	13/10/15	45	Subgraphs		H.S.Dhami
11	14/10/15	46	Multi Graphs	1&1	H.S.Dhami
	15/10/15		Euler Circuits		
	16/10/15		Hamiltonian Graphs		

	17/10/1 5		Chromatic Numbers		
	20/10/1 5				
	21/10/1 5				
	22/10/1 5				
	23/10/1 5				
	24/10/1 5				

Signature of Faculty
Date

- Note: 1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED **BOLDLY**.
-

MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.

	COURSE	2013-14
	COMPLETION STATUS	Regulation: R11

FACULTY DETAILS:

Name of the Faculty:: **S.Divya**

Subject:: **MFCS**
53022

Subject Code

Department:: **IT**

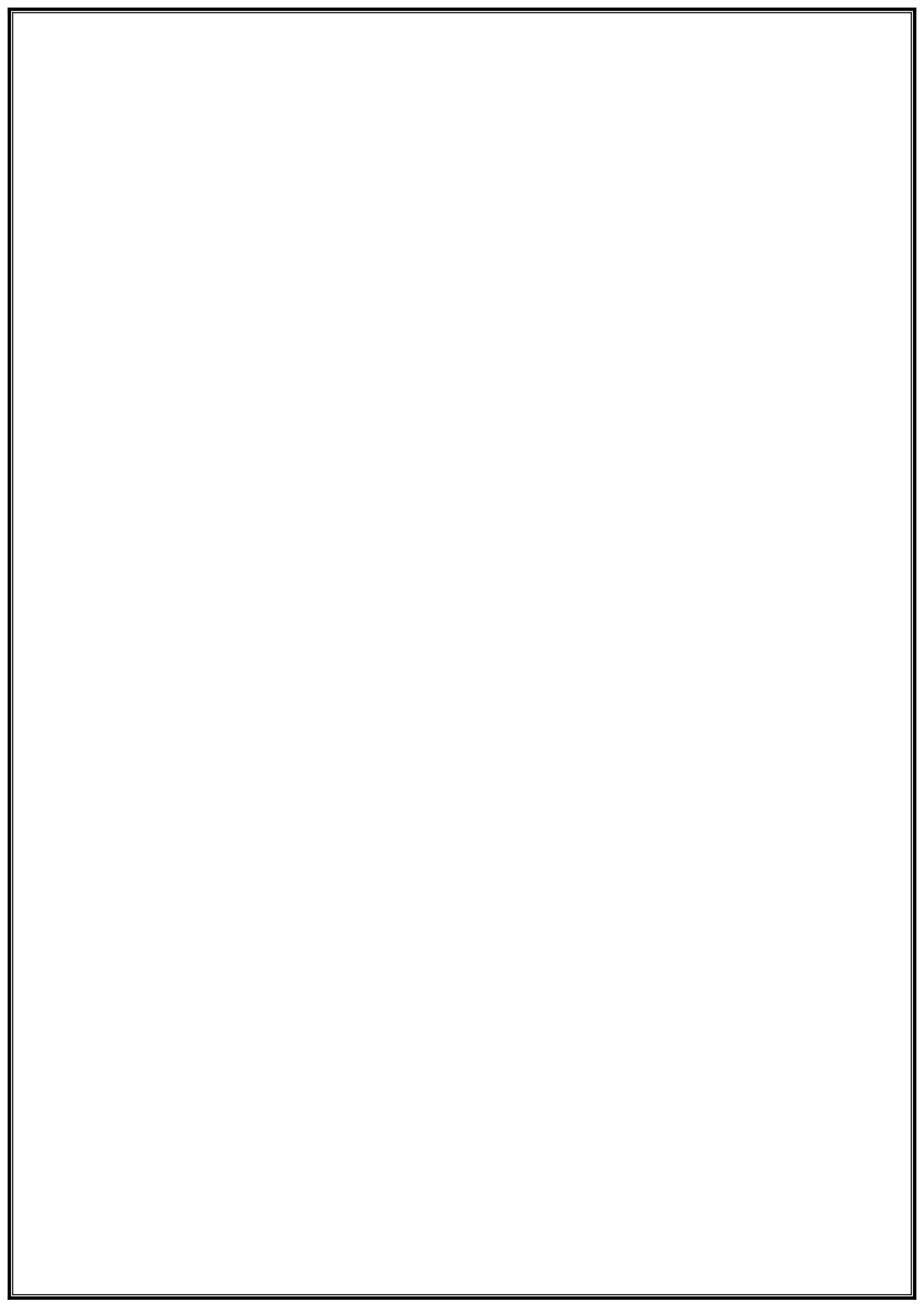
Actual Date of Completion & Remarks, if any

Units	Remarks	Nos. of Objectives Achieved
Unit 1	Completed as per course file	As Per Cp
Unit 2	Completed as per course file	As Per Cp
Unit 3	Completed as per course file	As Per Cp
Unit 4	Completed as per course file	As Per Cp
Unit 5	Completed as per course file	As Per Cp

Signature of Dean of School
Date:

Signature of Faculty
Date:

NOTE: AFTER THE COMPLETION OF EACH UNIT MENTION THE NUMBER OF OBJECTIVES ACHIEVED.





TUTORIAL SHEETS - I

2015-16

Regulation: R14

FACULTY DETAILS:

Name of the Faculty: **S.Divya**
Designation: **Asst.prof**
Department: **IT**

The Schedule for the whole Course / Subject is: **MFCS**

Date:

This Tutorial corresponds to Unit Nos.

Time:

1. Define Converse, Contra positive, Inverse of a conditional statement
2. Construct truth tables for
$$\begin{array}{l} p \\ q \\ p \rightarrow q \end{array} \quad \begin{array}{l} [p \rightarrow q] \\ [p \rightarrow q] \\ [p \rightarrow q] \end{array}$$
3. Are $(p \rightarrow q) \rightarrow r$ and $p \rightarrow (q \rightarrow r)$ logically equivalent or not? Verify using laws of logic and truth table
4. Prove by direct, indirect, proof by contradiction
"If n is odd then $n+11$ is even"
5. Show that $\neg(q \wedge (p \rightarrow q)) \rightarrow \neg p$
6. Define whether following relations are one-one, onto or both
 - a) $A = \{v, w, x, y, z\}$, $B = \{1, 2, 3, 4, 5\}$, $R = \{(v,2), (w,1), (x,3), (y,5)\}$
 - b) $A = \{1, 2, 3, 4, 5\}$, $B = \{1, 2, 3, 4, 5\}$, $R = \{(1,2), (2,3), (3,4), (4,5), (5,1)\}$
7. $f = x^2 - 2$, $g = x + 4$. Find $g \circ f$ and $f \circ g$. State they are one-one, onto or both

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the objectives to which these questions / Problems are related.

Signature of Dean of School
Date:

Signature of Faculty
Date:



TUTORIAL SHEETS - II

2015-16

Regulation: R14

FACULTY DETAILS:

Name of the Faculty: S.Divya
Designation: Asst.prof
Department: IT

Date:

This Tutorial corresponds to Unit Nos.

Time:

1 Explain the properties of binary relations

2 Write short notes on algebraic structure. Define Identity and Inverse

3A) In how many ways 3 boys share 15 different sized apples if each take

5 B) Find the arrangements of letters of MISSISSIPPI

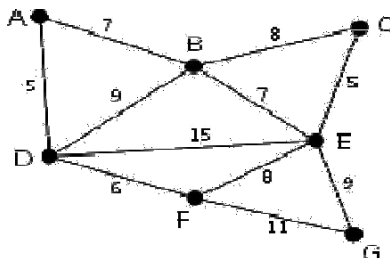
4A) Find the coefficient of x^9y^3 in the expansion of $(x+2y)^{12}$

B) Find the coefficient of $x_1^2x_3x_4^3x_5^4$ in the expansion of $(x_1+x_2+x_3+x_4+x_5)^{10}$

5 Solve $a_n=3a_{n-1}$, $n \geq 1$ using generating functions

6 Solve the recurrence relation of $a_n-7a_{n-1}+10a_{n-2}=0$ using generating functions

7 Find the minimal spanning tree for the given graph using prim's algorithm



8.

- i)
- ii)

Define the following graphs with 1 suitable examples for each graph

Complement graph

ii) Subgraph

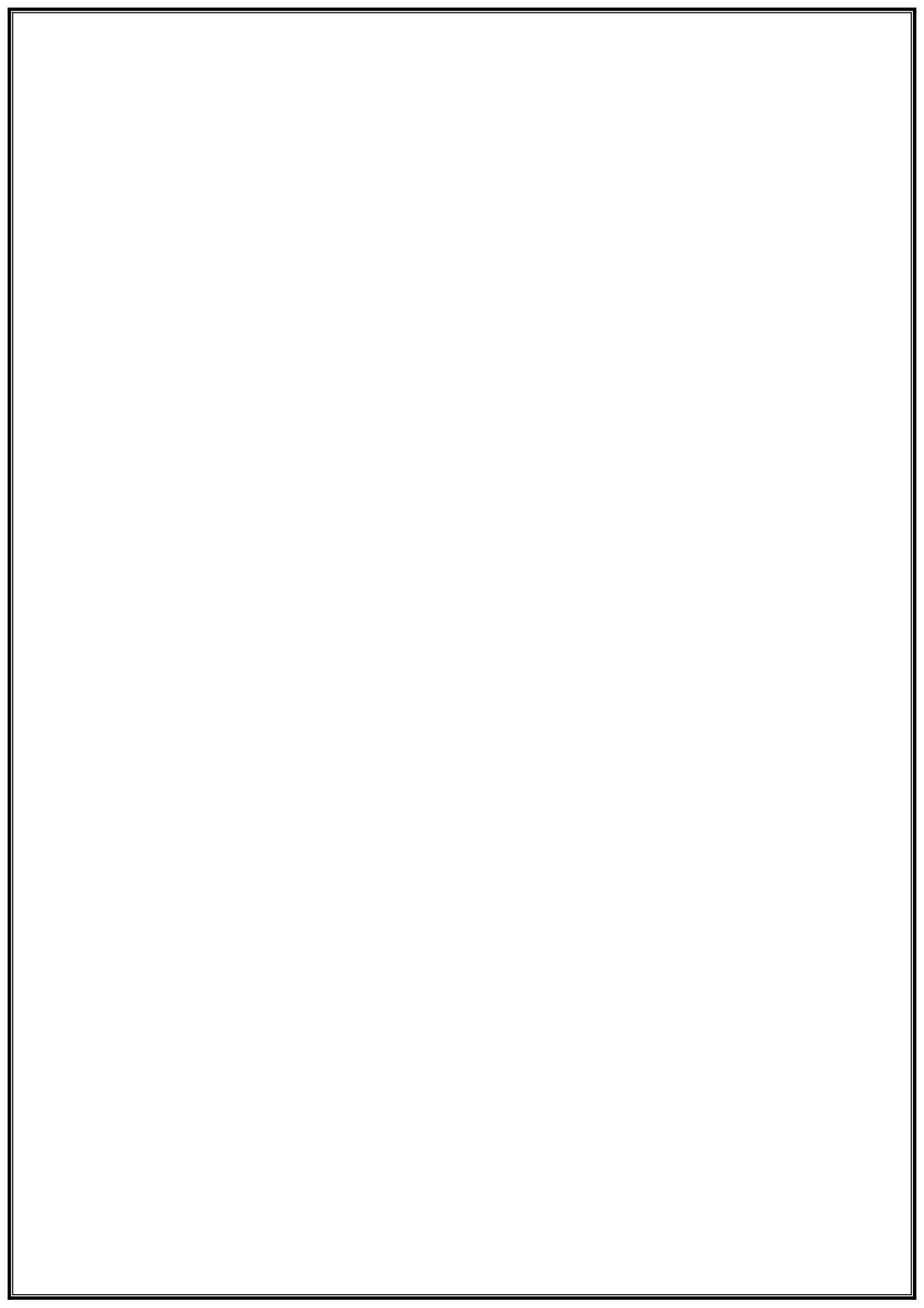
Induced subgraph

iv) Spanning subgraph

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the objectives to which these questions / Problems are related.

Signature of Dean of School
Date:

Signature of Faculty
Date:





ILLUSTRATIVE VERBS FOR STATING INSTRUCTIONAL OBJECTIVES

2015-16

Regulation: R14

These verbs can also be used while framing questions for Continuous Assessment Examinations as well as for End – Semester (final) Examinations.

ILLUSTRATIVE VERBS FOR STATING GENERAL OBJECTIVES

Know Comprehend	Understand Apply	Analyze Design	Generate Evaluate
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ILLUSTRATIVE VERBS FOR STATING SPECIFIC OBJECTIVES:

A. Cognitive Domain

1	2	3	4	5	6
Knowledge	Comprehension Understanding	Application of knowledge & comprehension	Analysis of whole w.r.t. its constituents	Synthesis combination of ideas/constituents	Evaluation judgement
Define	Convert	Change	Breakdown	Categorize	Appraise
Identify	Defend	Compute	Differentiate	Combine	Compare
Label	Describe (a procedure)	Demonstrate	Discriminate	Compile	Conclude
List	Distinguish	Deduce	Distinguish	Compose	Contrast
Match	Estimate	Manipulate	Separate	Create	Criticize
Reproduce	Explain why/how	Modify	Subdivide	Devise	Justify
Select	Extend	Predict		Design	Interpret
State	Generalize	Prepare		Generate	Support
	Give examples	Relate		Organize	
	Illustrate	Show		Plan	
	Infer	Solve		Rearrange	
	Summarize			Reconstruct	
				Reorganize	
				Revise	

B. Affective Domain		C. Psychomotor Domain (skill development)				
Adhere	Resolve	Bend	Dissect	Insert	Perform	Straighten
Assist	Select	Calibrate	Draw	Keep	Prepare	Strengthen
Attend	Serve	Compress	Extend	Elongate	Remove	Time
Change	Share	Conduct	Feed	Limit	Replace	Transfer
Develop		Connect	File	Manipulate	Report	Type
Help		Convert	Grow	Move precisely	Reset	Weigh
Influence		Decrease	Handle	Operate	Run	
Initiate		Demonstrate	Increase	Paint	Set	



LESSON PLAN
Unit-1

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code **53022**

Unit I

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction, Statements and notations	2	H.S.Dhami	Lecture
2	Connectives	2	H.S.Dhami	
3	Well formed formulas, Truth Tables	2	H.S.Dhami	
4	Well formed formulas, Truth Tables	2	H.S.Dhami	
5	Problems on truth tables	2	H.S.Dhami	
6	tautology	2	H.S.Dhami	
7	Problems on tautology	2	H.S.Dhami	

8	equivalence implication	2	H.S.Dhami	
9	Normal forms.	2	H.S.Dhami	
10	Problems on normal forms	2	H.S.Dhami	

On completion of this lesson the student shall be able to(Outcomes)

1. understand the **Statements and notations, Connectives**
 2. understand the **Well formed formulas, Truth Tables, tautology, Normal forms**
 3. understand the Quantifiers, predicates
 4. understand the Consistency, proof of contradiction
-



**ASSIGNMENT
Unit-I**

2015-16

Regulation: R14

Assignment / Questions

1. (a) Show that $R \vee (P \vee Q)$ is a valid conclusion from premises $P \vee Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\neg !M$.

(b) Construct truth table for $(P \rightarrow Q) \wedge (R \rightarrow Q) \leftrightarrow (P \vee R) \rightarrow Q$.

2. Show that the following statements is a tautology.

$$((P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow R)) \rightarrow R$$

3 Define Converse, Contra positive, Inverse of a conditional statement

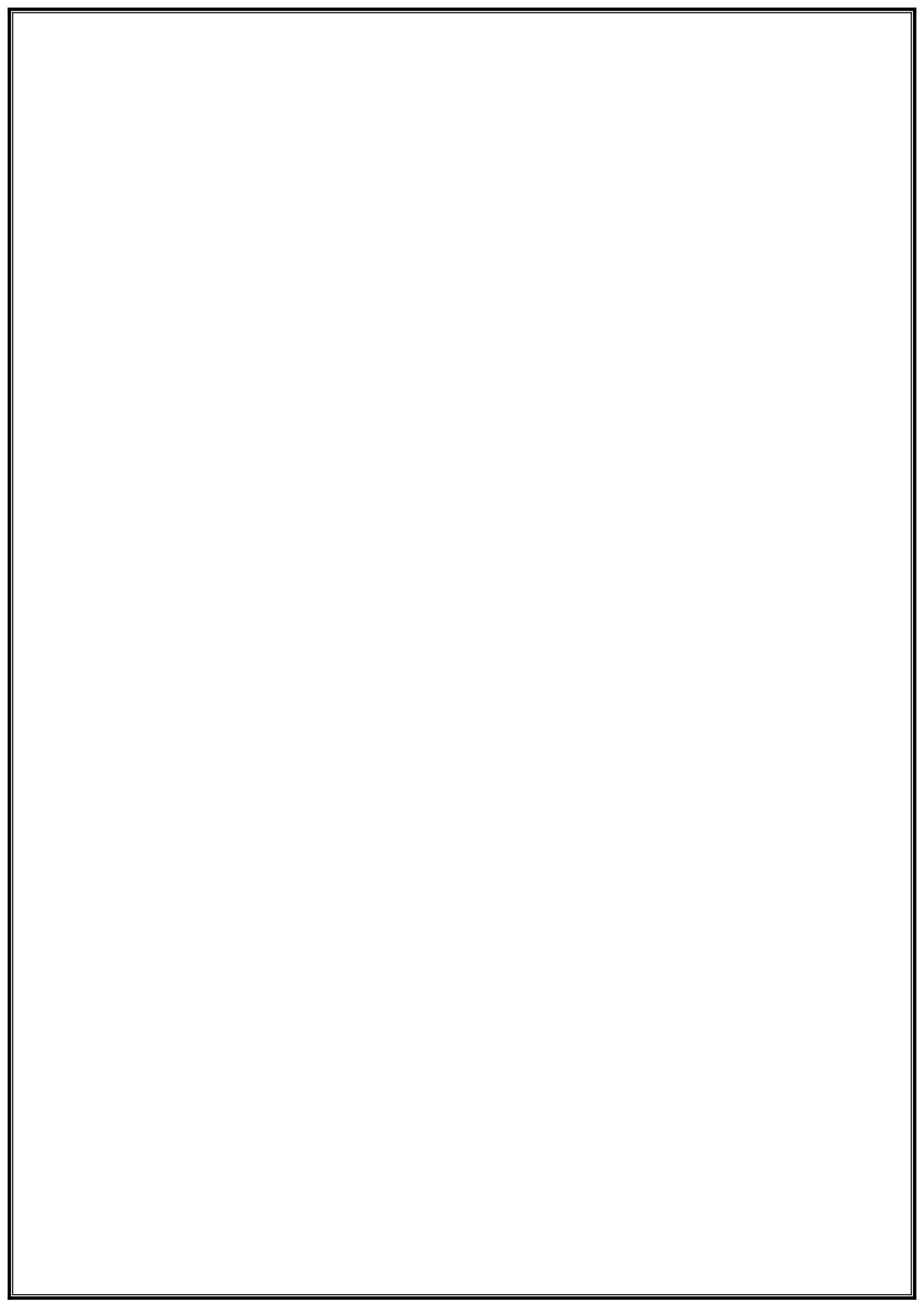
4 Construct truth tables for

iii) $[p \rightarrow q] \wedge [\neg p \rightarrow q]$
iv) $p \rightarrow [\neg q \vee r]$

5 Are $(p \rightarrow q) \rightarrow r$ and $p \rightarrow (q \rightarrow r)$ logically equivalent or not? Verify using laws of logic and truth table

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Note: Mention for each question the relevant objectives and outcomes.





LESSON PLAN
Unit-I

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code 53022

Unit I

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction, Predicative logic	2	H.S.Dhami	Lecture
2	Free & Bound variables and problems	2	H.S.Dhami	
3	Rules of inference	2	H.S.Dhami	
4	Consistency and problems	2	H.S.Dhami	
5	proof of contradiction	2	H.S.Dhami	
6	Automatic Theorem Proving			

On completion of this lesson the student shall be able to

1. You are understanding of **Predicative logic**
2. You are understanding of **Free & Bound variables and problems**
3. You are understanding of **Rules of inference**
4. You are understanding of **proof of contradiction, Automatic Theorem Proving**



**ASSIGNMENT
Unit-I**

2015-16

Regulation: R14

Assignment / Questions

1. Explain the use of predicates with suitable examples.
2. Show that the following statements are logically equivalent without using truth table.

$$\neg P \leftrightarrow Q \quad P \leftrightarrow \neg Q.$$

3. Prove by direct, indirect, proof by contradiction

“If n is odd then n+11 is even”

4. Show that $\Rightarrow (\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$

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Note: Mention for each question the relevant objectives and outcomes.



LESSON PLAN
Unit-II

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code **53022**

Unit II

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction , Properties of binary Relations	2	H.S.Dhami	Lecture
2	Equivalence, transitive,closure	2	H.S.Dhami	
3	compatibility and partial ordering relations	2		
4	lattices	2		
5	Hasse diagram	2		
6	Functions, inverse function	2		
7	Composition of functions	2		
8	Recursive functions	2		
9	Lattice and its properties	2		

On completion of this lesson the student shall be able to(Outcomes)

1. You are understanding of **Properties of binary Relations, compatibility and partial ordering relations**
2. You are understanding of **lattices, Hasse diagram**
3. You are understanding of **hasse diagram,inverse**
4. You are understanding of **Composition of functions**



**ASSIGNMENT
Unit-II**

2015-16

Regulation: R14

Assignment / Questions

1. Define the relation R on the set A of positive integers by $(a,b) \in R$ iff a/b can be expressed in the form 2^m . Where m is an arbitrary integer. Show that R is an equivalence relation.

2. Draw the Hasse diagram of $\langle x, \leq \rangle$ where $x = \{2, 3, 6, 12, 24, 36\}$ and the relation \leq be such that $x \leq y$ if x divides y.

3 Define whether following relations are one-one, onto or both

c) $A = \{v, w, x, y, z\}$, $B = \{1, 2, 3, 4, 5\}$, $R = \{(v,2), (w,1), (x,3), (y,5)\}$

d) $A = \{1, 2, 3, 4, 5\}$, $B = \{1, 2, 3, 4, 5\}$, $R = \{(1,2), (2,3), (3,4), (4,5), (5,1)\}$

4 $f = x^2 - 2$, $g = x + 4$. Find gof and fog. State they are one-one, onto or both

5 Explain the properties of binary relations

6 Write short notes on algebraic structure. Define Identity and Inverse

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Note: Mention for each question the relevant objectives and outcomes.



LESSON PLAN
Unit-IV

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code 53022


Unit III

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction, algebraic systems	2	H.S.Dhami	Lecture
2	Examples and properties.	3	H.S.Dhami	
3	Semi groups	3		
4	monoids.	3		
5	Groups and sub groups	2		
6	Homomorphism, isomorphism.	2		

On completion of this lesson the student shall be able to (Outcomes)

1. You are understanding of algebraic systems
2. You are understanding of semi groups
3. You are understanding of monoids
4. You are understanding of group sub group

	ASSIGNMENT Unit-III	2015-16
		Regulation: R14

Assignment / Questions

1. If $(G, *)$ and (H, Δ) are two groups and $f: G \rightarrow H$ isomorphism, then prove that The kernel of f is a normal subgroup.
2. Find all the properties that satisfies for the following algebraic systems under the Binary operations x and $+$.
 - (a). Odd integers
 - (b). All the positive integers.

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Note: Mention for each question the relevant objectives and outcomes.



LESSON PLAN
Unit-IV

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code53022


Unit IV

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction , Basis of counting,	2	H.S.Dhami	Lecture
2	Combinations & Permutations	2		
3	with repetitions, Constrained repetition	2		
4	Binomial Coefficients,	2		
5	Binomial Multinomial theorems	2		
6	the principles of Inclusion – Exclusion.			

On completion of this lesson the student shall be able to (Outcomes)

1. You are understanding of basic of counting
2. You are understanding of combination
3. You are understanding of permutation
4. You are understanding of binomial multinomial theorem

	ASSIGNMENT Unit-III	2015-16
		Regulation: R14

Assignment / Questions

1. Show that a graph G is self complementary if it has $4n$ or $4n+1$ vertices (n is non negative integer).

2. Show that any simple graph with two or more vertices has at least two vertices of the same degree. (Hint : Use the Pigeon hole principle).

3a) Define and Prove Pigeon Hole Principle by the method of contradiction.

b) In a sample of 120 logic chips, 24 have a defect D1, 22 have a defect D2, 35 have a defect D3, 10 have defects D1 and D2, 15 have defects D1 and D3, 18 have defects D2 and D3 and 3 have all the three defects. Find the number of chips having 1) at least one defect 2) no defects

4A) In how many ways 3 boys share 15 different sized apples if each take

5 B) Find the arrangements of letters of MISSISSIPPI

5A) Find the coefficient of x^9y^3 in the expansion of $(x+2y)^{12}$

B) Find the coefficient of $x_1^2x_3x_4^3x_5^4$ in the expansion of $(x_1+x_2+x_3+x_4+x_5)^{10}$

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Note: Mention for each question the relevant objectives and outcomes.



LESSON PLAN
Unit-IV

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code53022


Unit IV

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction, Generating Functions	2	H.S.Dhami	Lecture
2	Function of Sequences Calculating Coefficient of generating function	2		
3	Recurrence relations,	2		
4	Solving recurrence relation by substitution and Generating funds	2		
5	Characteristics roots solution of In homogeneous Recurrence Relation.	2		
6	problems	2		
7	Problems on relations	2		

On completion of this lesson the student shall be able to (Outcomes)

1. You are understanding of functions
2. You are understanding of recurrence relation
3. You are understanding of homogeneous relation
4. You are understanding of generating funds

	ASSIGNMENT Unit-IV	2015-16
		Regulation: R14

Assignment / Questions

1. Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 4^n$
2. the recurrence relation $a_n - 4a_{n-1} + 4a_{n-2} = (n+2)^2$. $a_0=0, a_1=1$
3. Solve $a_n = 3a_{n-1}$, $n \geq 1$ using generating functions
4. Solve the recurrence relation of $a_n - 7a_{n-1} + 10a_{n-2} = 0$ using generating functions

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Note: Mention for each question the relevant objectives and outcomes.



LESSON PLAN
Unit-V

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code53022

Unit V

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Introduction	2	H.S.Dhami	Lecture
2	Representation of Graph	2		
3	Representation of Graph	2		
4	DFS	2		
5	BFS	2		
6	Spanning Trees	2		
7	planar Graphs	2		
8	problems	2		

On completion of this lesson the student shall be able to

1. You are understanding of representation of graph
2. You are understanding of DFS
3. You are understanding of BFS
4. You are understanding of spanning tree



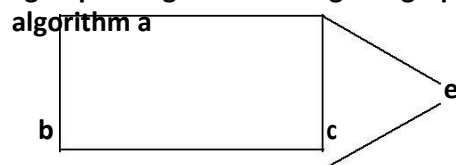
**ASSIGNMENT
Unit-V**

2015-16

Regulation: R14

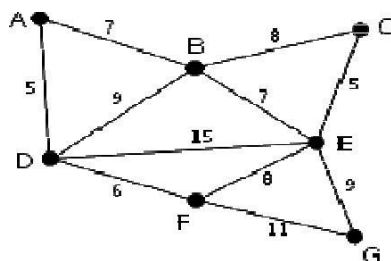
Assignment / Questions

1. Explain the steps involved in deriving a spanning tree for the given graph using BFS



2 Explain the algorithm of DFS traversal of a graph by giving a suitable example

3 Find the minimal spanning tree for the given graph using prim's algorithm



4 Define the following graphs with 1 suitable examples for each graph

iii)

Complement graph

ii) Subgraph

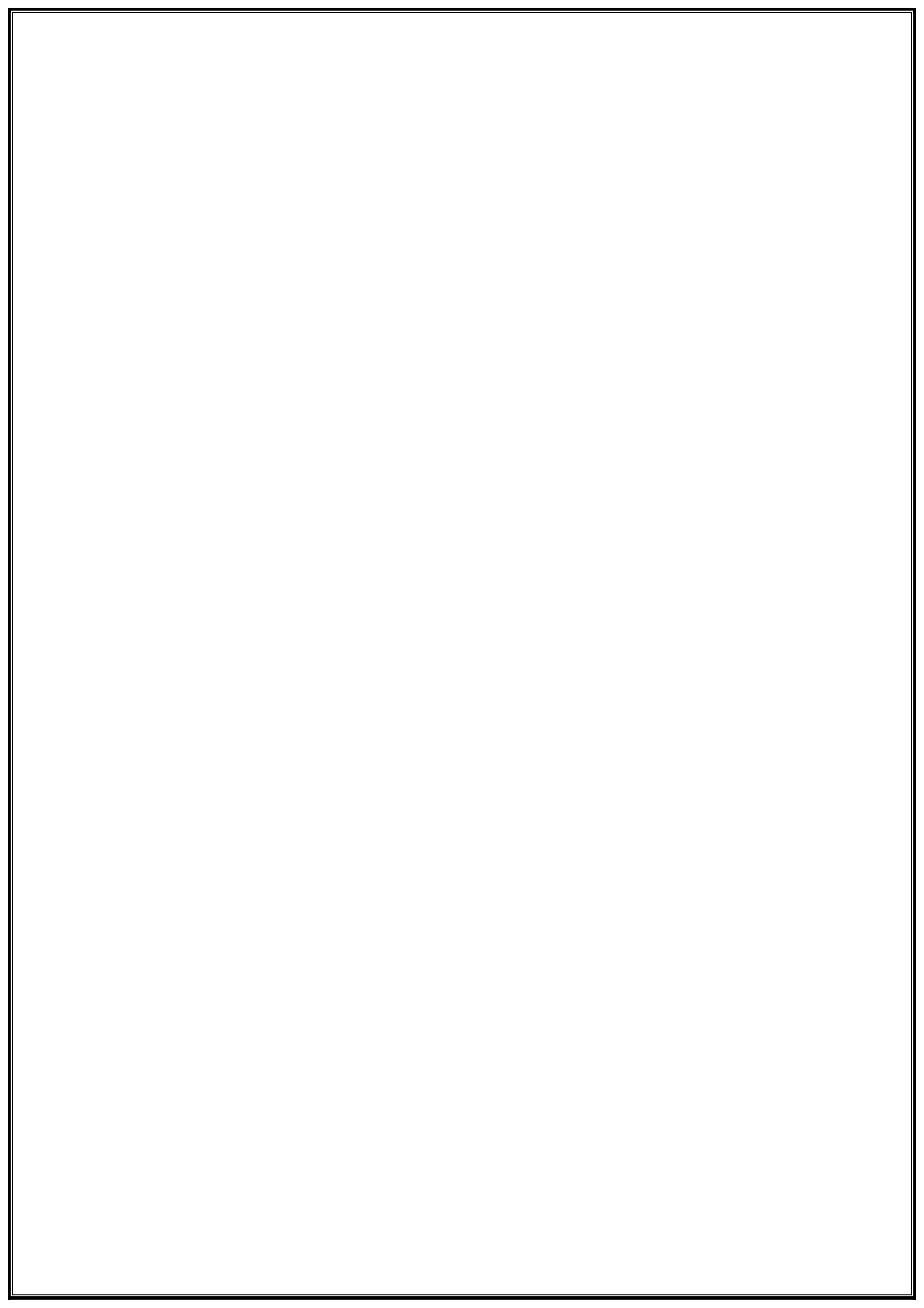
iv)

Induced subgraph

iv) Spanning subgraph

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Note: Mention for each question the relevant objectives and outcomes.





LESSON PLAN
Unit-V

2015-16

Regulation: R14

Name of the Faculty: S.Divya

Subject MFCS

Subject Code53022

Unit V

INSTRUCTIONAL OBJECTIVES:

Session No	Topics to be covered	Time	Ref	Teaching Method
1	Graph Theory and Applications	2	H.S.Dhami	Lecture
2	Basic Concepts Isomorphism and Sub graphs,	2		
3	Multi graphs and Euler circuits	2		
4	Hamiltonian graphs,	2		
5	Chromatic Numbers.	2		

On completion of this lesson the student shall be able to

1. You are understanding of graphs theory
2. You are understanding of Isomorphism
3. You are understanding of multi graph
4. You are understanding of chromatic number



**ASSIGNMENT
Unit-V**

2015-16

Regulation: R14

Assignment / Questions

1 Define the following terms. Give an example for each

i)Euler path

ii)Euler circuit

iii)Multigraph

iv)Hamiltonian graph

1. 2. Explain the following terms and determine the number of edges in

i)Complete graph

ii)Complete biparite graph

ii)Cycle graph

iv)Path graph

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Note: Mention for each question the relevant objectives and outcomes.