RGPV BHOI	V (I PAL	DIPLO	MA WING)	OB CO	E CURRICULUI URSE	M FOR	Tł	IE F	ORMAT-	3 Sheet No. 1/3
Branch			COMP ENGIN	PUTER NEERING	SCIENCE AND			Semes	ster I	IFTH
Course	Code		1	Course Name	THEORY O	F COMPUT.	ATION	1		
									<u>(Hrs)</u>	(Marks)
Cours	e Outo	ome 1	DESIGN FIN	ITE AUTO	MATA FOR REGULAR LA	NGUAGES.			43	50
Learnir	ng Out	come 1	Explain Basics	of Set Theo	ry and its Operations.					
Conten	ts		Basics o     Members	f Set Theory ship, Subset	y: Set, Set Elements, Cardinali , Power Set, Universal Set.	ty, Finite & Inf	finite Set	, Set	8	10
			• Set Oper Product.	ations: Unic	on, Intersection, Complementat	on, Set Differer	nce, Cart	esian		
Method	l of Ass	sessment	TERM WORK	/ ASSIGNN	IENT (INTERNAL)					
Learnir	ng Out	come 2	Construct Trar	sition Mat	rix & Transition Graph for D	FA and NFA.			8	10

Contents	• Introduction to Finite Automata, Transition Graph, Transition Matrix, Deterministic and Nondeterministic Finite Automata.		
Method of Assessment	tEND SEM THEORY (EXTERNAL)		
Learning Outcome 3	Differentiate Finite Automata with Output and without Output.	10	10
Contents	<ul> <li>Equivalence of DFA &amp; NFA, Minimization of Finite Automata, Mealy &amp; Moore Machines with its Transition Matrix and Transition State Diagram.</li> </ul>		
Method of Assessment	tPROGRESSIVE TEST-I (INTERNAL)		
Learning Outcome 4	Convert Finite Automata to Regular Expression.	10	10
Contents	<ul> <li>Regular Expressions, Identities of Regular Expression.</li> <li>Finite Automata and Regular Expression: DFA to Regular Expression, Regular Expression to NFA.</li> </ul>		
Method of Assessment	tEND SEM THEORY (EXTERNAL)		
Learning Outcome 5	Explain the Concepts of Regular Grammar.	7	10
Contents	• Regular Language, Regular Grammar, Left Linear and Right Linear Grammar, Pumping Lemma for Regular Languages, Closure Properties of Regular Languages.		

Method of Assessment	END SEM THEORY (EXTERNAL)		
Course Outcome 2	DESIGN PUSHDOWN AUTOMATA FOR CONTEXT FREE LANGUAGES.	28	30
Learning Outcome 6	Explain the basics of Context Free Grammars.	10	10
Contents	<ul> <li>Introduction to Type-2 Grammar, Context Free Language, Relation Between Regular Languages and Context Free Language, Closure properties of Context Free Language, Leftmost Derivation and Rightmost Derivation, Derivation Tree and Ambiguity.</li> </ul>		
Method of Assessment	END SEM THEORY (EXTERNAL)		
Learning Outcome 7	Determine Simplified Context Free Grammar.	9	10
Contents	<ul> <li>Simplification of Context Free Grammars, Eliminate Useless Productions, Null Productions &amp; Unit Productions, Normal Forms: Chomsky Normal Form and Greibach Normal Forms.</li> </ul>		
Method Of Assessment	PROGRESSIVE TEST-II (INTERNAL)		
Learning Outcome 8	Illustrate PDA for Context Free Languages.	9	10

Contents	<ul> <li>Definition of Pushdown Automata, Deterministic Pushdown Automata, Nondeterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a PDA, The pumping lemma for CFL.</li> </ul>		
Method of Assessment	END SEM THEORY (EXTERNAL)		
Course Outcome 3	EXPLAIN TURING MACHINE AND COMPLEXITY THEORY.	19	20
Learning Outcome 9	Illustrate Turing Machine, Representations and its Types.	12	10
Contents	<ul> <li>Introduction to Turing Machine, Turing Machine's Model, Representation and Design of Turing Machine, Types: Multitape TM, Nondeterministic TM, Universal TM.</li> </ul>		
Method of Assessment	END SEM THEORY (EXTERNAL)		
Learning Outcome 10	Explain Polynomial and Non Polynomial Class Problems.	7	10
Contents	<ul> <li>Introduction to Complexity Problems, Types: Polynomial Class - P class Problems, Non-Polynomial Class- NP Class Problems, NP Complete &amp; NP Hard Problems.</li> </ul>		
Method of Assessment	END SEM THEORY (EXTERNAL)		

				SCHEME I	FOR LEARI	NING	Br	anch Code	Co	urse Code	CO Code	LO Code	Л
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COURSI	E NAME	THE	ORY (	<b>OF COMPUT</b> A	ATION								
CO Desc	cription	DESIGN FINITE AU	UTOM	ATA FOR REGI	ULAR LANGI	J <b>AGES</b> .	•						
LO Desc	ription	Explain Basics of Set	t Theor	y and its Operat	ions.								
					SCHEME OF	STUDY	,						
S. No.		Learning Content		Teaching – Learning Method	Description L Proce	n of T- ss	Teach Hrs.	Pract. /Tut Hrs.	L	Rs Requ	iired		Remarks
1	H     S     H     N     S     I     I     I     I     I     H     F	Basics of Set Theory: Set Elements, Cardina Finite & Infinite Set, Membership, Subset, Po Set, Universal Set. Set Operations: Un Intersection, Complementation, Difference, Carte Product.	Set, ality, Set ower nion, Set esian	Traditional Lecture method + Handout	Teacher will explain the contents and provide hand to students.	dout	08	0	Hand	outs / B Conter	ooks / E- its	NIL	
				S	CHEME OF AS	SESSME	ENT	1					
S. No.	Metho	od of Assessment	De	scription of Asse	essment	Maxi Ma	imum arks	Re	source	s Requi	red	Ext	ernal / Internal
1	TERM ASSIGN	WORK/ NMENT		Question Ansv	ver	1	.0						Internal
			AD	DITIONAL INSTR	UCTIONS FOR	THE HO	DD/ FACI	JLTY (IF A	NY)				

		ma Wing \ Bhona	SCHE	ME FOR LEARN	IING		Branch (	Code	C	ourse Co	de	CO Code	LO Code	<b>/</b>
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COURS	E NAME	THEOR	Y OF COM	PUTATION										
CO Des	cription	DESIGN FINITE AUT	OMATA FOR	<b>REGULAR LANGU</b>	AGES.									
LO Deso	cription	<b>Construct Transition M</b>	atrix & Transi	ition Graph for DFA	and NFA	L								
				SCHEME OF	STUDY									
S. No.		Learning Content	Teaching – Learning Method	Description of T Process	-L Te H	ach rs.	Pra /Tut	act. Hrs.	L	.Rs Re	equir	ed		Remarks
1	• Ir T D F	troduction to Finite ransition Graph, Transit eterministic and Nonc inite Automata.	Automata, on Matrix, eterministic	Teacher will explain the contents and provide handout to students. Teacher will conduc quiz to make studer practice their knowledge.	t nts	)8		0	Hand Cont	louts , ents	/ Bool	(s / E-	NIL	
				SCHEME OF ASS	SESSMEN	Т								
S. No.	Metho	od of Assessment	Description o	fAssessment	Maximu Marks	ım S		Res	ource	s Req	uirec		Ext	ternal / Internal
1	END	SEM THEORY	Question	n Answer	10				Test	Pape	r			External
	·		ADDITIONAL I	NSTRUCTIONS FOR	THE HOD	)/ FA	CULTY	( (IF A	NY)					

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COURS	SE NAME	THE	ORY	OF COM	IPUTATION									
CO Des	cription	DESIGN FINITE A	UTOM	IATA FOR	R REGULAR LANG	GUAGES.								
LO Des	cription	Differentiate Finite	Autom	ata with O	utput and without (	Output.								
					SCHEME O	F STUDY								
S. No.	Lea	rning Content	Tea Lea M	ching – arning ethod	Description of Process	f T-L	Teac h Hrs.	Pract. /Tut Hrs.	L	.Rs R	equir	ed		Remarks
1	• Equivalence of DFA & NFA, Minimizatio of Finite Automata Mealy & Moor Machines with it Transition Matrix an Transition Stat Diagram		Traditi Lectur + Hano	ional e method dout	Teacher will explain contents and provid handout to student	n the de rs.	10	0	Hanc Cont	louts ents	/ Bool	ks / E-	NIL	
					SCHEME OF A	SSESSME	NT							
S. No.	Metho	d of Assessment	De	escription	of Assessment	Maxin Mar	num ks	Res	source	s Req	uired		Ext	ternal / Internal
1	PROGR I	ESSIVE TEST-	C	Question A	nswer + Quiz	10			Test	Pape	r			Internal
	I		ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)											

				SCHEM	E FOR LEAF	RNING	Branch	Code	Course	Code	CO Code	LO Code	Л
KGPV	י (טוףוט)	oma wing ) Bh	opai	(	OUTCOME		C 0	4			1	4	Format No. 4
COURS	E NAME	TH	EORY	OF COMPL	TATION								
CO Des	cription	<b>DESIGN FINITE</b>	AUTOM	ATA FOR RI	EGULAR LANC	GUAGES.							
LO Des	cription	Convert Finite Aut	tomata t	o Regular Exp	pression.								
					SCHEME C	OF STUDY							
S. No.	Lear	rning Content	Teachir M	ng –Learning lethod	Description o Process	of T-L Te	each Hrs.	Pract. /Tut Hrs.	LR	s Requ	ired		Remarks
1	<ul> <li>R</li> <li>E</li> <li>Id</li> <li>R</li> <li>E</li> <li>E</li> <li>R</li> <li>E</li> <li>R</li> <li>E</li> <li>R</li> <li>to</li> </ul>	Regular Expressions, dentities of Regular Expression. Finite Automata and Regular Expression: DFA to Regular Expression, Regular Expression o NFA.	Tradition method ·	al Lecture + Handout	Teacher will ex the contents ar provide handou students.	plain 1d ut to	10	0	Hanc / E-C	douts / I	Books	NIL	
	1				SCHEME OF A	SSESSMEN	IT	1					
S. No.	Metho	od of Assessment	De	scription of A	ssessment	Maximu	m Marks	Resc	ources	Requir	ed	Ex	ternal / Internal
1	END SE	M THEORY				1	0		Test P	aper			External
			AD	DITIONAL INS	TRUCTIONS FO	R THE HOD	)/ FACULT	Y (IF ANY)					

			امم	SCHEME	FOR LEAR	NING	Br	ranch	Code	C	ourse Co	ode	CO Code	LO Code	Л
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COURS	E NAME	THE	ORY	OF COMPUT	ATION										
CO Deso	cription	DESIGN FINITE AU	UTOM	IATA FOR REG	ULAR LANG	UAGES.									
LO Desc	ription	Explain the Concept	s of Re	egular Grammar	•										
					SCHEME O	F STUDY									
S. No.	Le	arning Content	Теас	hing –Learning Method	Descriptio Proc	on of T-L ess	Tea ch Hrs	Pi Ti	ract. / ıt Hrs.		LRs F	Requii	red		Remarks
1	<ul> <li>R</li> <li>R</li> <li>L</li> <li>L</li> <li>P</li> <li>R</li> <li>C</li> <li>R</li> </ul>	Regular Language, Regular Grammar, Left Linear and Right Linear Grammar, Cumping Lemma for Regular Languages, Closure Properties of Regular Languages.	Trad meth	itional Lecture nod + Handout	Teacher will the contents provide han students. Teacher will quiz to make practice the knowledge	explain s and dout to conduct e students ir	07		0	Hai E-C	ndou Conte	ts / Bo nts	ooks /	NIL	
				S	SCHEME OF A	SSESSMENT	<b>-</b>								
S. No.	Metho	od of Assessment	De	escription of Ass	essment	Maximu Marks	ım S		Reso	ource	es Re	quire	d	Ext	ernal / Internal
1	END	SEM THEORY		Question Ans	wer	10				Test	Рар	er			External
,			AD	DITIONAL INSTR	RUCTIONS FO	R THE HOD	/ FACl	ULT	(IF AN	IY)					

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COURSI	E NAME	THE	ORY C	OF COMPL	J <b>TATION</b>								
CO Deso	cription	DESIGN PUSHDOV	VN AUT	FOMATA FO	OR CONTEXT FF	REE LA	NGUA	GES.					
LO Desc	ription	Explain the basics of	f Contex	t Free Gram	mars.								
		·			SCHEME OF	STUDY							
S. No.		Learning Content		Teaching -Learning Method	Description of Process	f T-L	Teach Hrs.	Pract. /Tut Hrs.	LRs	Requi	red		Remarks
1	• Ir G L R C C F D D A	ntroduction to frammar, Context anguage, Relation E egular Languages fontext Free Lat closure properties of ree Language, L perivation and Rig perivation, Derivation T mbiguity.	Type-2 Free Between and nguage, Context eftmost ghtmost ree and	Traditional Lecture method + Handout	Teacher will expla the contents and provide handout students. Teacher will cond quiz to make stud practice their knowledge	ain to luct dents	10	0	Handou E-Conte	uts / Bo ents	oks /	NIL	
				1	SCHEME OF AS	SESSME	INT	1					
S. No.	Metho	od of Assessment	Des	cription of A	ssessment	Maxin Mar	num ks	Re	sources	Requir	ed		External / Internal
1	END	SEM THEORY		Question A	nswer	10			Test P	aper			External
			ADD	ITIONAL INS	STRUCTIONS FOR	THE HO	DD/ FAC	ULTY (IF AN	IY)				

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COURS	E NAME	THE	ORY	OF COMPU	U <b>TATION</b>									
CO Dese	cription	DESIGN PUSHDOV	VN A	UTOMATA F	OR CONTEXT I	F <mark>REE</mark> L	ANGUA	GES	•					
LO Desc	ription	Determine Simplifie	d Con	itext Free Gran	nmar.									
		, 			SCHEME C	F STUD	γ							
S. No.	L	earning Content		Teaching – Learning Method	Description o Process	of T-L	Teach H	rs.	Pract. /Tut Hrs.	LRs	s Requi	ired		Remarks
1	<ul> <li>Simplification of Contex Free Grammars, Eliminat Useless Productions, Nu Productions &amp; Un Productions, Norma Forms: Chomsky Norma Form and Greibac Normal Forms.</li> </ul>		ext ate full fnit nal nal ach	Traditional ∟ecture method + Handout	Teacher will exp the contents an provide handou students. Teacher will con quiz to make students praction their knowledge	olain nd ut to nduct ce e	09		0	Hand Book Conte	louts / ːs / E- ents		NIL	
					SCHEME OF A	SSESSN	/IENT							
S. No.	Metho	od of Assessment	D	escription of A	Assessment	Maxir	num Mar	ks	Resou	irces R	equire	d	Ex	ternal / Internal
1	PROG	RESSIVE TEST-II		Question A	nswer		10		Т	est Pa	per			Internal
			A	DDITIONAL IN	STRUCTIONS FO	R THE H	HOD/ FAC	ULT	Y (IF ANY)				1	

RGPV	(Diplo	oma Wing ) Bh	opal	SCHEM	E FOR LEAF	RNING	]	Branch Code	Course C	ode CO Code	LO Code	Format No. 4
RGPV COURSI CO Desc LO Desc S. No. 1	(Diplo E NAME cription cription Lear	oma Wing ) Bh         THI         DESIGN PUSHDO         Illustrate PDA for         ning Content         vefinition of ushdown Automa         a, Deterministic         ushdown Automa         a, Deterministic	Opal EORY ( OWN AU Context Teachin M Tradition method +	DF COMPU TOMATA FO Free Languag g –Learning ethod al Lecture Handout	DUTCOME TATION OR CONTEXT Ses. SCHEME C Description of Process Teacher will ex the contents ar provide handou students.	FREE L DF STUD of T-L plain nd ut to	Y Teach Hrs.	0   4     AGES.     Pract.     /Tut Hrs.     0	LRs R Handouts Contents	equired / Books / E-	Sode 3 NIL	Format No. <b>4</b>
	r -t N P -t co gi co P le	a, fondeterministic ushdown Automa a, PDA prresponding to iven CFG, CFG prresponding to a DA, The pumping emma for CFL.										
I					SCHEME OF A	SSESSIV	IENT	1	1			
S. No.	Metho	od of Assessment	De	scription of A	ssessment	Maxi Ma	mum Irks	R	esources R	equired		External / Internal
1	END	SEM THEORY		Question A	nswer	1	0		Test Pa	per		External
			ADI	DITIONAL INS	TRUCTIONS FO	R THE H	IOD/ FA	CULTY (IF A	NY)			1

RGPV (Diploma Wing ) Bhopal			SCHEME FOR LEARNING			i C	Branch Code	Co	ourse Co	ode	CO Code 3	LO Code 1	Format No. <b>4</b>	
COURSE NAME THE			EORY OF COMPUTATION											
CO Description EXPLAIN TURING MACHINE AND COMPLEXITY THEORY.														
LO Description Illustrate Turing Machine, Representations and its Types.														
					SCHEME C	OF STUD	Y							
S. No.	Learning Content		tent Teaching –Learning Method		Description of T-L Process		Teach Hrs.	Pract. /Tut Hrs.	LRs Required			ed	Remarks	
1	• Ir T T M R D M N N T	<ul> <li>Introduction to Turing Machine, Turing Machine's Model, Representation and Design of Turing Machine, Types: Multitape TM, Nondeterministic TM, Universal TM.</li> </ul>		al Lecture - Handout	Teacher will explain the contents and provide handout to students.		12	0	Handouts / Books / E- Contents			ks / E-	NIL	
					SCHEME OF A	ASSESSIV	IENT							
S. No.	Metho	d of Assessment Description of As			ssessment Maximu Marks		mum Irks	R	esources Required					External / Internal
1	END SE	M THEORY	Question Answer/quiz			10		Test Paper					External	
			ADI	DITIONAL INS	TRUCTIONS FO	OR THE H	IOD/ FA	CULTY (IF A	NY)					

RGPV (Diploma Wing ) Bhopa			SCHEME FOR LEARNING OUTCOME				Branch Code		Course Code		LO Code	A	
						C	0 4			3	2	Format No. 4	
COURS	COURSE NAME THEORY OF COMPUTATION												
CO Des	cription	EXPLAIN TURING MA	ACHINE AND COMPLEXITY THEORY.										
LO Des	cription	Explain Polynomial and	Non Polynomial Class Problems.										
SCHEME OF STUDY													
S. No.	Lo	earning Content	Teaching – Learning Method	Description o Process	of T-L	Teac h Hrs.	Pract. /Tut Hrs.	LRs Required				Remarks	
1	• Ir C T P C C P	ntroduction to omplexity Problems, ypes: Polynomial Class - class Problems, Non- olynomial Class- NP lass Problems, NP omplete & NP Hard roblems.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge		7	0	Handouts / Books / E- Contents			NIL	NIL	
		/		SCHEME OF A	SSESSME	NT	1						
S. No.	Met	hod of Assessment	f Assessment Maximu Marks		num ks	n Resources Required					External / Internal		
1	END SE	M THEORY	Question Answer		10	10			t Pap	er		External	
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													