



**Dr. MGR-JANAKI COLLEGE
OF ARTS & SCIENCE FOR WOMEN**

SATHYABAMA MGR MALIGAI
11 & 13, Durgabai Deshmukh Road, RA Puram, Chennai - 28

An ISO 9001:2015 CERTIFIED INSTITUTION
Affiliated to the University of Madras



**DR.MGR JANAKI COLLEGE OF ARTS
AND SCIENCE FOR WOMEN**

DEPARTMENT OF COMPUTER SCIENCE



Dr. MGR-JANAKI COLLEGE OF ARTS & SCIENCE FOR WOMEN

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B.SC.COMPUTERSCIENCE (WITH EFFECT FROM THE ACADEMIC YEAR 2023-24)

I PREAMBLE

Bachelor of Computer Science is a 3 – Year under Graduate Programme spread over six semesters. The course is designed to achieve high degree of technical skills in Problem solving and application development. The course develops requisite professional skills and problem solving abilities for pursuing successful career in software industry and forms the required basics for pursuing higher studies in Computer Science.

II Eligibility

A passing the higher secondary Examination (Academic Stream) conducted by the Government of Tamil Nadu with Mathematics as one of the subjects.

III Programme Objectives

PO1	Scientific aptitude will be developed in Students
PO2	Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the Computer Science & humanities stream.
PO3	Students will become employable; Students will be eligible for career opportunities in education field, Industry, or will be able to opt for entrepreneurship.
PO4	Students will possess basic subject knowledge required for higher studies, professional and applied courses.
PO5	Students will be aware of and able to develop solution-oriented approach towards various Social and Environmental issues.
PO6	Ability to acquire in-depth knowledge of several branches of Computer Science and aligned areas. This Programme helps learners in building a solid foundation for higher studies in Computer Science and applications.
PO7	The skills and knowledge gained leads to proficiency in analytical reasoning, which can be utilized in modeling and solving real-life problems.
PO8	Utilize computer programming skills to solve theoretical and applied problems by critical understanding, analysis and synthesis.
PO9	Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others.
PO10	Mould the students in to responsible citizens in a rapidly changing interdependent society.



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IV Programme Specific Objectives

PSO1	Think in a critical and logical based manner
PSO2	Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve problems in mathematics or statistics and real time application related sciences.
PSO3	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
PSO4	Understand, formulate, develop programming model with logical approaches to Address issues arising in social science, business and other contexts.
PSO5	Acquire good knowledge and understanding to solve specific the critical and applied problems in advance dare as of Computer science and Industrial statistics.
PSO6	Provide students/learners sufficient knowledge and skills enabling them to undertake further studies in Computer Science or Applications or Information Technology and its allied areas on multiple disciplines linked with Computer Science.
PSO7	Equip with Computerscience technical ability, problem solving skills, creative talent and power of communication necessary for various forms of employment.
PSO8	Develop a range of generic skills helpful in employment, internships & societal activities.
PSO9	Get adequate exposure to global and local concerns that provides platform for further exploration into multi-dimensional aspects of computing sciences.
PSO10	The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured



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YEAR-ISEMESTER-I

Part	Subject Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-I	3	6
Part-II	100L1Z	English Paper-I	3	6
Part-III	125C1A	Core Course-I:Python Programming	5	4
	125C11	Core Course-II:Python Programming Practical	5	5
		Elective-II Generic/Discipline Specific(Anyone):	3	5
	125E1A 125E1B 125E1C	Mathematics I Statistics I Physics I		
Part-IV	125S1A	Skill Enhancement Course-I: Office Automation*	2	2
	100L1L	Basic Tamil-I(Other Language Students)*		
	100L1M	Advanced Tamil-I(Other Language Students)*		
	125B1A	Foundation CourseFC: Fundamentals of Computers	2	2
			23	30

*PART-IV:SEC-1/Basic Tamil/AdvancedTamil(Anyone)

1. Students who have studied Tamil upto XII STD and also have taken Tamil in Part I shall take SEC-I.
2. Students who have **not** studied Tamil upto XIISTD and have taken any Language other than Tamil in Part-I shall take **Basic Tamil** comprising minutes to complete of Two Courses(levelwillbeat6thStd.).
3. Students who have studied Tamil upto XII STD and have taken any Language other thanTamil inPart-I shall take**Advanced Tamil** comprising of Two Courses.

YEAR-I SEMESTER-II

Part	Subject Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-II	3	6
Part-II	100L2Z	English Paper-II	3	6
Part-III	125C2A	Core Course-III: Introduction to Computer Architecture And Microprocessor	5	4
	125C21	Core Course-IV: Introduction to Computer Architecture And Microprocessor Practical	5	5
	125E2A 125E2B 125E2C	Elective-II Generic /Discipline Specific (Any one):Mathematics II/ Statistics II/Physics II	3	5
Part-IV	125S2A	Skill Enhancement Course-II: Quantitative aptitude	2	2
	100L2L	Basic Tamil-II(Other Language Students)*		
	100L2M	Advanced Tamil-II(Other Language Students)*		
	125S2B	Skill Enhancement Course-III: Problem solving Techniques	2	2
			23	30



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YEAR-II SEMESTER-III

Part	Subject Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-III	3	6
Part-II	200L3Z	English Paper-III	3	6
Part-III	225C3A	CoreCourse-V: Java Programming	5	4
	225C31	CoreCourse-VI: Java Programming Practical	5	5
	225E3A 225E3B 225E3C	Elective-III Generic/Discipline Specific(Anyone): Mathematics I/ Statistics I/ Physics I	3	5
	225S31	Skill Enhancement Course-IV:(Entrepreneurial Based): Web Page Design Practical	1	1
Part-IV	225S32	Skill Enhancement Course-V: Desktop publishing Practical	2	2
	----	Environmental Science		1
			22	30

YEAR-II SEMESTER-IV

Part	Subject Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-IV	3	6
Part-II	200L4Z	English Paper-IV	3	6
Part-III	225C4A	CoreCourse-VII: Data Structures and Algorithms	5	4
	225C41	CoreCourse-VIII: Data Structures and Algorithms Practical	5	4
	225E4A 225E4B 225E4C	Elective-IV Generic/Discipline Specific(Anyone): Mathematics II/ Statistics II/ Physics II	3	5
	225S4A	Skill Enhancement Course-VII: Emotional Intelligence	2	2
Part-IV	225S4B	Skill Enhancement Course-VII: Technical Writing	2	2
	225V4A	Environmental Science	2	1
			25	30



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YEAR- III SEMESTER-V

Part	Subject Code	List of Courses	Credit	Hours
Part-III	325C5A	Core-IX: Operating System	4	5
	325C51	Core-X: Operating System Practical	4	5
	325C5B	Core-XI: Relational Database Management System	4	5
	325C52	Core-XII: Relational Database Management System Practical	4	5
	325E5A 325E5B 325E5C	Elective Course-V: Computer Network/ Mobile Ad-hoc work/Data Mining and Warehousing	3	4
	325E5D 325E5E 325E5F	Elective Course-VI: Software Engineering / Software Testing /Digital Image Processing	3	4
Part-IV	325V5A	Value Education	2	2
	325V5B	Internship/Industrial Training(During summer vacationat The end of IV semester)	2	--
			26	30

YEAR- III SEMESTER-VI

Part	Subject Code	List of Courses	Credit	Hours
Part-III	325C6A	Core Paper-XIII: Programming in ASP.NET	4	6
	325C61	Core Paper-XIV: Programming in ASP.NET Practical	4	5
	325C6B	Core Paper-XV: Project with Vivavoce	4	5
	325E6A 325E6B 325E6C	Elective-VII: Artificial intelligence/ Introduction To Data Science/Internet of Things and its Applications	3	5
	325E6D 325E6E 325E6F	Elective-VIII: Cloud Computing/ Big Data Analytics/Block Chain Technology	3	5
	Part-IV	325V6A	Professional Competency Skill Course: Advanced Excel	2
325V6B		Extension Activity	1	--
			21	30



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B.SC COMPUTERSCIENCE (WITH EFFECT FROM THE ACADEMIC YEAR 2020-21)

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II COURSE OBJECTIVES

- Acquisition of Knowledge and understanding of system, various programming languages and tools required for effective computation based problem solving.
- Utilize emerging technological tools learn, adapt and successfully write effective procedural coding meeting the needs of technical and societal challenges
- Attain sufficient knowledge related to computer domains, possesses technical, soft and hard skills and apply them effectively in team work
- Empower the students with competencies in creative thinking and problem solving, inter-personal communication and managerial skills.

III GRADUATE ATTRIBUTES

- Computational Knowledge
- Problem analysis & Solving
- Design & Development of Solutions
- Modern tool usage
- Communication skills
- Innovation & Entrepreneurship
- Societal & environmental concern

IV COURSE OUTCOMES

After Completion of the course, the students are expected to

- Understand the basic principles and concepts of Computer Science and integrate the knowledge gained in Computer Science domain with practical needs of the society and be an ethically and socially responsible Computer Science Professional
- Explore emerging technologies in diverse areas of Computer Science and inculcate skills for successful career, entrepreneurship and higher studies
- Apply the concepts of Computer and practices via emerging technologies and Software development tools



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COURSE STRUCTURE:

COURSE CONTENT	I SEMESTER						
	COURSE NAME	Ins.Hrs	CREDITS	MAX.MARKS			
				Ext.	Int.	Total	
PART I	Tamil/Other languages –I	6	3	75	25	100	
PART II	BP2-ENG01-Communicative English I	3	3	50	50	100	
PART III	BCE-CSC01-Problem Solving using Python@	6	4	75	25	100	
	BCE-CSC02-Core Practical-I-Problem Solving using Python Lab@	5	3	60	40	100	
	BMA-CSA01-Allied I: Mathematics-I@	6	5	75	25	100	
PART IV	Basic Tamil/ Advanced Tamil/NMEI*	-	2	75	25	100	
	BP4-EPSC01-English for Physical Science I	4	4	50	50	100	
Total Credits			24				
II SEMESTER							
PART I	Tamil/Other languages –II	6	3	75	25	100	
PART II	BP2-ENG02-Communicative English II	3	3	50	50	100	
PART III	BCE-CSC03-Computer Organization@	6	4	75	25	100	
	BCE-DSC04-Core Practical-II-Computer Organization Lab	5	3	60	40	100	
	BMA-CSA02-Allied II: Mathematics II@	6	5	75	25	100	
PART IV	Basic Tamil/Advanced Tamil/NME-II*	-	2	75	25	100	
	BP4-EPSC02-English for Physical Science II	4	4	50	50	100	
Total Credits			23				
III SEMESTER							
PART I	Tamil/Other languages –III	6	3	75	25	100	
PART II	BP2-ENG03-Language Through Literature-I	6	3	50	50	100	
PART III	BCE-CSC05-Java and Data Structures@	6	4	75	25	100	
	BCE-CSC06-Core Practical-III-Data Structures using Java Lab@	3	3	60	40	100	
	BPS-CSA01-Allied III-Physics-I(Theory)@	6	3	75	25	100	
	BPS-CSAP1-Allied Physics- I(Practical)	3	2	Examination will be held in IV Sem.			
	(OR)						
	BST-CSA01-Allied III-Statistics I@	9	5	75	25	100	
PART IV	Soft Skill	-	3	50	50	100	
	Environmental Studies	-	Examination will be holding Semester IV				
Total Credits			21				



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IV SEMESTER						
PART I	Tamil/Other languages-IV	6	3	75	25	100
PART II	BP2-ENG04-Language Through Literature-II	6	3	50	50	100
PART III	BCE-CSC07-Web Technology@	6	4	75	25	100
	BCE-CSC08-Core Practical-IV-Web Technology Lab@	3	3	60	40	100
	BPS-CSA02-Allied IV-Physics-II(Theory)@	6	3	75	25	100
	BPS-CSAP1-Allied Physics-I&II(Practical)	3	2	60	40	100
	(OR)					
	BST-CSA02-Allied IV-Statistics II@	9	5	75	25	100
PART IV	Soft Skill	-	3	50	50	100
	Environmental Studies	-	2	75	25	100
	Total Credits		23			
V SEMESTER						
COURSE CONTENT	COURSE NAME	Ins.Hrs	CREDITS	MAX.MARKS		
				Ext.	Int.	Total
PART III	BCE-CSC09-Computer Network@	6	4	75	25	100
	BCE-CSC10-Operating System@	6	5	75	25	100
	BCE-CSC11-Relational Database Management System@	6	4	75	25	100
	BCE-CSC12-Core Practical-V-Operating System Lab@	3	3	60	40	100
	BCE-CSC13-Core Practical-VI-PL/SQL Lab@	3	3	60	40	100
	Elective I-Choose anyone from the list	5	5	75	25	100
PART IV	Value Education	2	2	75	25	100
	Total Credits		26			
VI SEMESTER						
PART III	BCE-CSC14-Software Engineering@	6	4	75	25	100
	BCE-CSC15-Introduction to Data Science@	6	5	75	25	100
	BCE-DSC16-Introduction to Cloud Computing	6	4	75	25	100
	BCE-DSC17-Core Practical-VII- CASE Tools and Testing Tools Lab	3	3	60	40	100
	Elective II-Choose anyone from the list	5	5	75	25	100
	BCE-CSC18-Core Practical-VIII-Mini Project@		5	60	40	100
PART V	Extension Activities		1			
	Total Credits		27			
	Total credits(Core,Elective,SBS)		143			

***NME: Choose Anyone From the Other Department**



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Elective I	
BCE-DSE1A	Artificial Intelligence and Expert System
BCE-DSE1B	Graphics and Visualization
BCE-DSE1C	Network Security
Elective II	
BCE-DSE2A	Mobile Computing
BCE-CSE2B	IOT and its Applications@
BCE-DSE2C	Block Chain Technology

LEARNING OUTCOME:

Course Name	Course Code	Course Outcome	LINK
SEMESTER – I			
Problem Solving using Python	BCE-CSC01	To Understand the principles of Python and acquire skills in programming in python	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC01.pdf?823808158
		To develop the emerging applications of relevant field using Python Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.	
		Able to develop simple turtle graphics programs in Python	
Core Practical-I - Problem Solving using Python Lab	BCE-CSC02	Understand the numeric or real life application problems and solve them.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC02.pdf?1630075696
		Apply a solution clearly and accurately in a program using Python.	
		Apply the best features available in Python to solve the situational problems.	
Python Programming	125C1A	Develop and execute simple Python programs CO2: CO3: CO4: CO5:	https://egovernance.unom.ac.in/ugsyllabus2324/pdf/125C1A.pdf?727507138
		Write simple Python programs using conditionals and looping for solving problems	
		Decompose a Python program into functions	
		Represent compound data using Python lists, tuples, dictionaries etc.	
		Read and write data from/to files in Python programs	
Python Programming	125C11	To understand the problem solving	https://egovernance.unom.ac.in



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Practical		approaches	n/ugsyllabus2324/pdf/125C11.pdf?1964823819
		To learn the basic programming constructs in Python	
		To practice various computing strategies for Python-based solutions to real world problems	
		To use Python data structures - lists, tuples, dictionaries.	
		To do input/output with files in Python.	
SEMESTER – II			
Computer Organization	BCE-CSC03	Describe the major components of a computer system and state their function and purpose.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC03.pdf?425647867
		Describe the microstructure of a processor	
		Demonstrate the ability to program a microprocessor in assembly language.	
		Classify and describe the operation DMA and peripheral Interfaces.	
Core Practical-II - Computer Organization Lab	BCE-DSC04	Implement the arithmetic operations in assembly language programming	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-DSC04.pdf?1954497225
		Understand the programming logic of 8085 in various aspects	
SEMESTER - III			
Java and Data Structures	BCE-CSC05	Students will be able to develop Java Standalone applications and Applets.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC05.pdf?1192662297
		Choose the appropriate data structure for modeling a given problem.	
Core Practical-III - Data Structures using Java Lab	BCE-CSC06	Write functions to implement linear and non-linear data structure operations.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC06.pdf?854073270
		Suggest appropriate linear and non-linear data structure operations for solving a given problem.	
SEMESTER - IV			
Web technology	BCE-CSC07	Understand the general concepts of PHP scripting language for the development of Internet websites.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC07.pdf?1312678124
		Understand the basic functions of MySQL database program and XML concepts	
		Learn the relationship between the client side and the server side scripts.	



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Core Practical-IV - Web Technology Lab	BCE-CSC08	On the completion of this laboratory course the students ought to Obtain knowledge and develop application programs using Python.	
		Create dynamic Web applications such as content management, user registration, and ecommerce using PHP and to understand the ability to post and publish a PHP website.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC08.pdf?1549247339
		Develop a MySQL database and establish connectivity using MySQL.	
SEMESTER - V			
Computer Network	BCE-CSC09	Analyze different network models	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC09.pdf?10890150
		Describe, analyze and compare a number of data link, network and transport layer	
		Analysing key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI	
Operating System	BCE-CSC10	Understand the structure and functions of Operating System	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC10.pdf?1347533989
		Compare the performance of Scheduling Algorithms	
		Analyze resource management techniques	
Relational Database Management System	BCE-CSC11	Describe basic concepts of database system	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC11.pdf?853796195
		Design a Data model and Schemas in RDBMS	
		Competent in use of SQL	
Core Practical-V - Operating System Lab	BCE-CSC12	Analyze functional dependencies for designing robust Database	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC12.pdf?1357559538
		Understand the process management policies and scheduling process by CPU.	
		Analyze the memory management and its allocation policies.	
Core Practical-VI - PL/SQL Lab	BCE-CSC13	To evaluate the requirement for process synchronization.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC13.pdf?2108690785
		Implement the DDL , DML Commands and Constraints	
		Create, Update and query on the database.	
		Design and Implement simple project with Front End and Back End.	



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ELECTIVE - I			
Artificial Intelligence and Expert System	BCE-DSE1A	Gain a working knowledge of the foundations of and modern applications in, artificial intelligence heuristic search, knowledge representation and logic.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-DSE1A.pdf?2081028277
Graphics and Visualization	BCE-DSE1B	Know the principles of Display devices	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-DSE1B.pdf?1240683474
		Understand various algorithms to scan, convert and basic geometrical primitives, transformations, Area filling and clipping.	
		Capture the significances of viewing and projections.	
		Define the fundamentals of 2D, 3D and color models	
Network Security	BCE-DSE1C	Compare various Cryptographic Techniques Design Secure applications	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-DSE1C.pdf?402766318
SEMESTER - VI			
Software Engineering	BCE-CSC14	The students should be able to specify software requirements, design the software using tools	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC14.pdf?1171968384
		To write test cases using different testing techniques	
Introduction to Data Science	BCE-CSC15	To describe what Data Science is, what Statistical Inference means, identify probability distributions, fit a model to data and use tools for basic analysis and communication	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC15.pdf?1481009195
Introduction to Cloud Computing	BCE-DSC16	To explain and apply levels of services of Cloud	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC16.pdf?1806962940
		To describe the security aspects in cloud	
Core Practical-VII - CASE Tools and Testing tools Lab	BCE-DSC17	Students must be able to analyze and design the problem at hand.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-DSC17.pdf?1714891596
		Students should be able to use UML tools for the designing the software and test the correctness and soundness of their software through testing tools.	
ELECTIVE - I			
Mobile Computing	BCE-DSE2A	Explain the basics of mobile telecommunication system.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-DSE2A.pdf?1208107023
		Choose the required functionality at each layer for given application.	



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		Use simulator tools and design Ad hoc networks and develop a mobile application	
IOT and its Applications	BCE-CSE2B	Use of Devices, Gateways and Data Management in IoT.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSE2B.pdf?1983030592
		Design IoT applications in different domain and be able to analyze their performance Implement basic IoT applications on embedded platform	
Block Chain Technology	BCE-DSE2C	State the basic concepts of block chain	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSE2C.pdf?1253438571
		Paraphrase the list of consensus and Demonstrate and Interpret working of Hyper ledger Fabric	
		Implement SDK composer tool and explain the Digital identity for government	
Core Practical-VIII - Mini Project	BCE-CSC18	The student should gain a thorough knowledge in the problem, he/she has selected and the language / software, he/she is using.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC18.pdf?815394084



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ASSESSMENT PATTERN

CORE PAPERS, ELECTIVE PAPERS AND EXTRA DISCIPLINARY PAPERS

INTERNAL ASSESSMENT: 25 Marks
EXTERNAL ASSESSMENT: 75 Marks

TOTAL: 100 Marks

INTERNAL ASSESSMENT PATTERN

Attendance (5 Marks)			Seminar	Assignment	Test	Total
90-100	80-90	70-80	(5 Marks)	(5 Marks)	(10 Marks)	25

EXTERNAL ASSESSMENT

End Semester External University Examination: 75 MARKS

Duration 3 Hours

- Part -A-(10X2=20) Answer any 10 out of 12 Questions 1-12
- Part -B-(5X5=25) Answer any 5 out of 7 Questions 13-19
- Part -C-(3X10=30) Answer any 3 out of 5 Questions 20-24
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QUESTION PAPER PATTERN

Subject Name	Marks	Total
Language, English, Core, Allied and NME Papers	PART- A: 10 out of 12 = 10 x 2 = 20 marks	75
	PART- B: 5 out of 7 = 5 x 5 = 25 marks	
	PART- C: 3 out of 5 = 3 x 10 = 30 marks	