P.R. GOVT. COLLEGE (A)

KAKINADA

Affiliated to Adikavi Nannaya University

Rajamahendravaram

DEPARTMENT OFCOMPUTER SCIENCE

CBCS(CLUSTER PATTERN)

BOARD OF STUDIES

2022-2023

Proceedings of the Principal, PITHAPUR RAJAH'S GOVERENMENT COLLEGE(A): Kakinada

Present: Dr.B.V.Tirupanyam,Ph.D

Rc.No.12A/A.C/BOS/2022-23, Dated: 24 Sept 2022

Sub: P.R.Government College (A), Kakinada-Board of Studies(BOS)-nomination of Members-orders Issued.

Ref: UGC Guidelines for Autonomous Colleges – 2018

ORDER:

The Principal, P.R.Govt.College(A), Kakinada is pleased to constitute Board of Studies in Computer Science and IOT(Internet Of Things) for framing the syllabi in Computer Science and Iot subjects for all semesters duly following the norms of the UGC Autonomous guidelines.

S.No	Name with Designation and Address	Designation
1	Sri. G B V Padmanadh In-Charge, Dept. of Computer Science P. R. Govt. College (A), Kakinada	Chair Person
2	t. N Nagasubramanyeswari turer in Computer Science S.D.Govt degree college for women (A) , Kakinada	University Nominee
3	i) Dr. N sridhar Lecturer in Computer Science Government Degree College, Tuni ii) Smt. G Satya Suneetha Lecturer in Computer Science A S D Govt. Degree College for Women(A), Kakinada	Subject experts
4	Sri. P. S. R. Subrahmanyam, Rtd. HOD of Mathematics, Ideal College of Arts & Science (A), Kakinada	Alumni Member
5	Sri A Sivakumar Developer TCS,Hyderabad	Industry Expert
6	Sri. R V Satyanarayana Lecturer in Computer Science P R Govt. College(A),Kakinada	member
7	Miss. G Aneetha Lecturer in Computer Science P R Govt. College(A),Kakinada	member
8	Sri Anantha teja Lecturer in Computer Science P R Govt. College(A),Kakinada	Member
9	Miss .K.Manisha Lecturer in Computer Science P R Govt. College(A),Kakinada	Faculty of the Department

10	Sharoon jyosthna	Student Member II B.SC-M.C.C.S
11	**N.Siva kumari**	Student Member II B.sc –M.P.C.S
12	V.Dora Babu	Student Member III B.Sc –M.C.Cs
13	A.S.V Pravallika	Student Member III B.sc –M.C.C.S
14	MD.Jafferen	Student Member III B.sc-M.S.C.S

The above members are requested attend the BOS meetings and share their valuable views , suggestions on the following functionaries:

a) Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stake holders and National requirement for consideration and approval of the Academic Council.

b) Suggest methodologies for innovative teaching and evaluation techniques .

c) Suggest panel of names to the Academic council for appointment of examiners.

d) Coordinate research, teaching, extension and other activities in the department of the college.

The term of the members will be Three years from the date of the nomination. The Chairman of the BOS(HoD / Lecturer In-Charge of the department) is directed to coordinate with the Principal of the college and conduct BoS meeting as and when necessary, but at least twice a year.

PRINCIPAL
P.R.GOVERNMENT COLLEGE(A) 28 Oct '24
KAKINADA

Copy to:

1. The above individuals
2. File

MEMBERS PRESENT

S.No	Name with Designation and Address	Designation
1	Sri. G B V Padmanadh In- Charge, Dept.of Computer Science P. R. Govt. College (A), Kakinada	Chairman
2	Smt. N.Naga Subramanyeswari Lecturer in Computer Science A.S.D.Govt degree college for women (A) , Kakinada	N.N.S. Eswari 31/10/22 University Nominee
3	i) Dr. N Sridhar Lecturer in Computer Science Government Degree College, Tuni ii) Smt. G Satya Suneetha Lecturer in Computer Science A .S. D .Govt. Degree College for Women(A), Kakinada	Subject experts Suneetha 31/10/22
4	Sri. D Sravan Kumar AWS admin, TCS, Hyderabad	Alumni Member
5	Sri A Sivakumar Developer TCS,Hyderabad	Industry Expert
6	Sri. R V Satyanarayana Lecturer in Computer Science P R Govt. College(A),Kakinada	R.V.Satyanarayana Member
7	Miss. G Aneetha Lecturer in Computer Science P R Govt. College(A),Kakinada	G. Aneetha Member
8	Sri. A Ananthateja Lecturer in Computer Science P R Govt. College(A),Kakinada	Member
9	Miss .K.Manisha Lecturer in Computer Science P R Govt. College(A),Kakinada	K. Manisha Member
10	Sharoon jyosthna	Student Member II B.Sc(MSCS)
11	N.Sivarkumari	Student Member II B.Sc(MPCS)
12	V.Dora Babu	Student Member III B.Sc(MCCS)
13	P.Aditya sai ganesh	Student Member III B.Sc (M.E.IOT)
14	Md .Jafferen	Student Member III B.Sc(MSCS)
15	K.Lakshmi Durga	Student Member II B.Sc(MECS)

P R GOVERNMENT COLLEGE [AUTONOMOUS] KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

BOARD OF STUDIES 2022-2023

The eightteenth meeting of Board of Studies ***COMPUTER SCIENCE*** has been conducted in the Department of Computer Science on ____ 31 OCT, 2022 to discuss the following.

AGENDA

1. Department activities for 2022-23 academic year.
2. Organizing National/State level Seminars / Workshops / Conferences / /Training programmes etc., with topics and other details
3. Plan for utilization of funds for Autonomous/CPE/other grants available for arranging guest lecturers, faculty improvement programmes, study tours, equipping laboratories, reference books & other necessary teaching-learning material.
4. Plan for organizing subject oriented community outreach programmes & allocation of necessary funds.
5. Institution of new medals/incentives/prizes etc., from alumni, philanthropists, parents, faculty etc.,
6. Any other programme that enhances the learning capacity of students and their employable & knowledge skills.
7. Suggest panel of examiners / paper setters & other experts / nominees for BOS deliberations.
8. Pedagogy implementation w.e.f admitted batch 2022-23
9. Internal Assessment weightage 40% for III Year students and 50% for I Year and II Year students
10. End Semester Examinations 2hrs .30 min and for 60 Marks, for III Year students , 2hrs 30mins for 50 marks for I Year and II Year students.
11. Conduct practical examination semester wise for three years.
12. Encounrage students to takeup certificate courses from IIT Bombay Spoken Tutorial ,Cisco and NPTEL
13. IOT syllabus for I , II and IIIyear students may be followed as framed by CCE AP
14. Any other issues with the permission of chair

RESOLUTIONS

1) The eightteenth meeting of Board of Studies ***COMPUTER SCIENCE*** has been conducted in the Department of Computer Science on __31___, oct 2022 discuss the following.
2) Department action plan 2022-23 submitted in annexure.
3) Pedagogy implementation w.e.f admitted batch 2022-23.
4) Resolved to approve panel of names for appointment of examiners/ paper setters annexed to these resolutions.
5) Resolved to conduct End Semester Examinations 2hrs .30 min and for 60 Marks, and Mid Semester Examinations 1 hr 15 min for 40 marks for III year students,
6) Resolved to conduct End Semester Examinations 2hrs .30 min and for 50 Marks, and Mid Semester Examinations 1 hr for 25 marks for I year II year students
7) Resolved to conduct practical examination semester wise for all Three years
8) Resolved to encourage students to takeup certified courses from IIT Bombay Spoken Tutorial and Cisco courses
9) Resolved to Follow IOT syllabus I , II and III Years as framed by CCE AP

PANEL OF NAMES FOR APPOINTMENT OF EXAMINERS/PAPERSETTERS

2022-23

S.NO	NAME OF THE LECTURER	NAME OF THE COLLEGE
1	Dr. N Sridhar	GDC Tuni
2	Smt. Naga Subramanyeswari	ASD Women's College ,Kakinada
3	Sri. D.Suneel	G.D.C.(A), Rajamahendravaram
4	Smt. G Satya Suneetha	ASD Women's College ,Kakinada
5	Sri RASMI RANJAN KHANSAMA	GDC TUNI
6	Dr. Ch. V. M. Hari	Dr VS Krishna G.D.C.(A), Visakhapatnnam
7	Sri. D. V. Raghava Swamy	Dr VS Krishna G.D.C.(A), Visakhapatnnam
8	Sri BODALA RAVI	GDC Tuni
9	N.NagaSubrahmanyeswari	ASD GDC(A) W, Kakinada
10	SSVAS Samba Murthy	GDC, Paderu
11	Dr Jahnavi	VS Krishna College, VIsakhapatnam

B.Sc. Computer Science

Courses for the Academic Year 2021-2022
B.Sc. PROGRAMME – COURSE STRUCTURE OF COMPUTER SCIENCE
UNDER CBCS PATTERN

S.No.	Semester	Course Code	Title of the Course (Paper)	Hrs/ Week	Max Marks (SEE)	Marks in CIA	total	Credits
1	SEM - I		Problem Solving in C	4	50	50	100	3
			Problem Solving in C Lab	2	0	50	50	2
2	SEM - II		Data Structures using C	4	50	50	100	3
			Data Structures using CLab	2	50	0	50	2
			Phase1 CSP		100		100	4
3	SEM-III		Database Management Systems	4	60	40	100	3
			Database Management Systems lab	2	--	50	50	2
4.	SEM IV		Object oriented programming using java	4	60	40	100	3
			Object oriented programming using java lab	2	50	--	50	2
			Operating Systems	4	60	40	100	3
			Operating Systems Lab	2	50		50	2
			Phase II Internship (2 months)		100		100	4
5	SEM-V	6A	WebInterface Designing Technologies	3	60	40	100	3
			WebInterface Designing lab	3	0	50	50	2
6		7A	Web Application using PHP and MYSQL	3	60	40	100	3
			Web Application using PHP and MYSQL lab	3	0	50	50	2
		6B	Internet of things	3	60	40	100	3
			Internet Of Things lab	3	0	50	50	2
		7B	Application Development using python	3	60	40	100	3
			Application Development using	3	0	50	50	2

			python lab					
		6C	Data Science	3	60	40	100	3
			Data Science lab	3	0	50	50	2
	Sem VI		Phase III Apprenticeship (6 months)		150	50	200	12
19	SEM I	Life skills 1	Basics of Computer Applications	2	50		50	2
20	SEM II	Life Skills 2	ICT	2	50		50	2

P R GOVERNMENT COLLEGE [AUTONOMOUS] KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

BOARD OF STUDIES 2022-2023

Marks Distribution for the III Year

Internal : 40 marks External: 60 marks

S.No.	Activities	Marks Allotted
1	Two Internal Mid Term Exams (Avg of two)..for 40 marks scaled down to 20	20 Marks
2	Attendance, seminars,quizz and Student Activities	20 Marks
		Total - 40 Marks

Marks Distribution for the I Year& IIYear

Internal: 50 marks External: 50 marks

S.No.	Activities	Marks Allotted
1	Two Internal Mid Term Exams (Avg of two).. for 25marks	25 Marks
2	Project/Assignments(10) seminars(5) Viva voce(10)	25 Marks
		Total - 50 Marks

Semester	Title of the Course(Paper)	Changes
SEM-I	Problem Solving in C	Unit II : Removed the GOTO statement Unit IV- Removed Arrays of Unions Variables, Arrays of Structures
	Problem Solving in C – Lab	Removed the Data Structures related programs from here.
SEM-II	Data Structures using C	Unit 1 : Removed the Array Basics in Unit II and Introduced the Operations on Arrays Unit III : Removed the Priority Queues and DeQueues Unit V : Removing the “, Spanning Trees, Shortest Path”
	Data Structures using C – Lab	Changed the questions according to the changes in syllabus.
SEM-III	DATABASE MANAGEMENT SYSTEMS	Unit 1 : Removed Cost of DBMS Unit II : Removed EER Model Unit III : Removed relational calculus Unit V : Removed Operator Precedence
	DATABASE MANAGEMENT SYSTEMS – Lab	Reduced the scope of DML queries
SEM-IV	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA	Unit I : Moved arrays to Unit II Unit II : Moved Inheritance, Polymorphism to Unit III. Unit III : Moved the Abstract classes, Interfaces, exception handling and packages to Unit IV Unit IV : Removed the Deadlocks and Daemon threads concepts. Removed Zip/Unzip, Serialization Concepts, Moveded the Threading Concepts to Unit V Unit V : Removed Applets as this is age old concept. Removed JDBC Concepts
SEM IV	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA – Lab	Removed the applet programs
SEM IV	Operating Systems	
SEM IV	Operating Systems - Lab	

I BSC

I B.Sc. – Computer Science / Semester- I (W.E.F. 2020-2021)
COURSE: PROBLEMSOLVINGINC
COURSE CODE: C1
Total Hrs. of Teaching-Learning: 60 @ 4 h / Week Total Credits: 03

Objective: Thiscourse aimsto provideexposureto problem-solvingthroughprogramming.
It introducestheconceptsoftheCProgramminglanguage.

Outcome: Uponsuccessful completionofthecourse,astudentwillbeableto:

1. Understandtheevolutionandfunctionalityofa DigitalComputer.
2. Applylogicalskillstoanalyseagivenproblem
3. Developanalgorithmforsolvingagivenproblem.
4. Understand‘C’languageconstructslikeIterativestatements,Arrayprocessing,Pointers,etc.
5. Apply‘C’languageconstructstothealgorithmsto writea‘C’languageprogram.

MODULE--I: **12hr**

a) **GeneralFundamentals:**Introductiontocomputers:Blockdiagramofacomputer,characteristicsandlimitationsofcomputers,applicationsofcomputers,typesofcomputers,computergenerations.

b) **IntroductiontoAlgorithmsandProgrammingLanguages**:Algorithm– KeyfeaturesofAlgorithms,FlowCharts,ProgrammingLanguages–Generationsof ProgrammingLanguages–StructuredProgrammingLanguage.

MODULE--II: **10hr**

a) **IntroductiontoC:**Introduction–StructureofCProgram–WritingthefirstCProgram FileusedinCProgram–CompilingandExecutingCPrograms–UsingComments Keywords–Identifiers–BasicDataTypesinC–Variables–Constants–I/OStatementsinC-OperatorsinC-ProgrammingExamples.

b) **DecisionControlandLoopingStatements:**IntroductiontoDecisionControlStatements– ConditionalBranchingStatements–IterativeStatements–NestedLoops– BreakandContinueStatement–GotoStatement

MODULE –III: **12hr**

a) **Arrays**:Introduction–DeclarationofArrays–AccessingelementsoftheArray– StoringValuesinArray–OperationsonArrays–onedimensional,twodimensionalandmulti-dimensionalarrays,characterhandlingandstrings.

MODULE—IV: **18hr**

a) **Functions**:Introduction –usingfunctions–Functiondeclaration/prototype – Functiondefinition–functioncall–returnstatement–Passingparameters–Scopeofvariables– StorageClasses–Recursivefunctions.

b) **Structure,Union,andEnumeratedDataTypes:**Introduction – NestedStructures– ArraysofStructures–StructuresandFunctions–Union–ArraysofUnionsVariables– UnionsinsideStructures–EnumeratedDataTypes.

MODULE—V: **18hr**

a) **Pointers:**UnderstandingComputerMemory–IntroductiontoPointers– declaringPointerVariables–PointerExpressionsandPointerArithmetic–NullPointers-PassingArgumentstoFunctionsusingPointer–PointerandArrays– MemoryAllocationinCPrograms–MemoryUsage–DynamicMemoryAllocation– DrawbacksofPointers

b) **Files:**IntroductiontoFiles–UsingFilesinC–ReadingDatafromFiles–WritingDatatoFiles– DetectingtheEnd-of-file– ErrorHandlingduringFileOperations– AcceptingCommandLineArguments.

Reference Books:

1. EBalagurusamy–ProgramminginANSIC–TataMcGraw-Hillpublications.
2. BrainW Kernighan and DennisMRitchie -The‘C’Programminglanguage” -

Pearsonpublications.

3. AshokN Kamthane:ProgrammingwithANSIandTurboC, PearsonEditionPublications.
4. YashavantKanetkar- Let Us‘C’–BPBPublications.
5.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. **Measurable**

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. **General**

1. Group Discussion

2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),

2. Closed-book and open-book tests,

3. Programming exercises,

4. Practical assignments and laboratory reports,

5. Observation of practical skills,

6. Individual and group project reports.

7. Efficient delivery using seminar presentations,

8. Viva voce interviews.

9. Computerized adaptive testing, literature surveys and evaluations,

10. Peers and self-assessment, outputs form individual and collaborative work

Practical Paper - I:
COURSE NAME:PROBLEM SOLVING IN C Lab
Course Code: C1L

Practical/Laboratory-I
DATA STRUCTURE USING IN C **Marks:50**

1. Writeaprogramtocheckwhetherthegivennumberis Armstrongornot.
2. Writeaprogramtofindthesumofindividualdigitsofapositiveinteger.
3. Writeaprogramtogeneratethefirstntermsof theFibonaccisequence.
4. Writeaprogramtofindboththelargestandsmallestnumberinalistofintegervalues
5. Write a program to demonstrate refection of parameters in swapping of two integer values using **Call by Value** &**Call by Address**
6. Writeaprogramthat usesfunctionstoaddtwomatrices.
7. Writeaprogramtocalculatefactorialofgivenintegervalue usingrecursivefunctions
8. Writeaprogramformultiplicationoftwo NXNmatrices.
9. Writeaprogramtoperformvariousstringoperations.
10. Writeaprogramtosearchanelementinagivenlistofvalues.
11. Writeaprogramtosortagivenlistofintegersin ascendingorder.
12. Write a program to calculate the salaries of all employees using ***Employee(ID,Name,Designation,BasicPay,DA,HRA,GrossSalary,Deduction,NetSalary)***structure.
    a. DAis30%of Basic Pay
    b. HRAis15%ofBasic Pay
    c. Deductionis10%of(Basic Pay+DA)
    d. Gross Salary= Basic Pay+DA+HRA
    e. Net Salary= Gross Salary- Deduction
13. Writeaprogramtoillustratepointerarithmetic.

14. Write a program to read the data character by character from a file.
15. Write a program to create ***Book(ISBN,Title,Author,Price,Pages,Publisher)*** structure and store book details in a file and perform the following operations
    a. Add book details
    b. Search a book details for a given ISBN and display book details, if available
    c. Update a book details using ISBN
    d. Delete book details for a given ISBN and display list of remaining Books

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT FOR THE YEAR 2022-2023
I B.SC (CS) 2022-2025 BATCH

COMPUTER SCIENCE COURSE: PROBLEMSOLVINGINC

COURSE CODE:C1

Time : 2.30 Hrs. **SEMESTER-I** **Max. Marks: 50**

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	**7**	**5**	**35**	**4**	**5**	**20**
2	Section-B Essay Questions	**6**	**10**	**60**	**3**	**10**	**30**
TOTAL		**13**		**95**	**TOTAL MARKS**		**50**

Percentage of choice given = $\frac{95 - 50}{95} \times 100 = \frac{45}{95} \times 100 = 47.36\%$

P.R.GOVT.COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPERS FOR THE YEAR 2022-2023
I B.Sc (CS) 2022-2025 BATCH
COMPUTER SCIENCE COURSE: PROBLEMSOLVINGINC

Time: 2.30 Hrs. **SEMESTER-I** **Max. Marks: 50**

SECTION-A

Answer any FOUR Questions **(4x5=20M)**

1. Write the characteristics of computers?
2. Explain the generations of computers?
3. Explain various data types in C?
4. Explain Control statements?
5. Explain about String handling functions?
6. Distinguish between Structures and Unions.
7. Write about File operations in C?

SECTION-B

Answer All Questions **(3x10=30M)**

8. a) Explain the Logical Organization of a Digital Computer with the help of Block Diagram?

   (Or)

   b) Write about the classification of computer in detail?

9. a) Explain various Conditional Control Statements in 'C' with examples?

   (Or)

   b) Explain the difference different types Array?

10. a) Explain different types of Functions in C?

    (Or)

    b) Explain about different types of Pointers in C?

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT FOR THE YEAR 2022-2023
I B.SC (CS) 2022-2025 BATCH
Computer Science Course: PROBLEMSOLVINGINC
COURSE CODE:C1

Time : 2.30 Hrs. **SEMESTER-I** **Max. Marks: 50**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
MODULE -I	2	2	30
MODULE -II	1	2	20
MODULE -III	1	1	15
MODULE–IV,V	2	2	30
Total No. of questions	6	8	
Total Marks Including choice			95

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
I B.SC (CS) 2022-2025 BATCH
SEMESTER-I
COURSE CODE: C1
COURSE NAME :PROBLEMSOLVINGINC

MODULE--I

Essay Questions:

1. Explain the Logical Organization of a Digital Computer with the help of Block Diagram?
2. Write about the classification of computer in detail?
3. How many Generations of Computers are there till date? Explain in each Generation in detail.

Short Answer Question:

1. Write the characteristics of Computer?
2. Explain the Generations of Computer?
3. Explain Applications of Computer?
4. Explain Programming Languages?
5. Explain about Algorithms, and Flow chart?

MODULE-II

Essay Questions:

1. Explain various Operators in C with example.
2. Explain various Conditional Control Statements in C with example.
3. Explain various Conditional Looping statements in C with example?

Short Answer Question:

1. Write the importance of C language
2. Explain about various constants in C.
3. Explain various data types in C.
4. Explain Structure of C language?
5. Explain Control Statements in C?

MODULE-III

Essay Questions

1. Explain different types of Arrays in C?
2. Explain various String handling Functions in C.
3. Explain multi- dimensionalarrays in C?

Short Answer Question

1. Explain two dimensional arrays to functions.
2. Explain how to pass arrays to functions.
3. Write any three String handling functions in C

MODULE-IV

Essay Questions

1. Explain different types of Functions in C?
2. What is Structure? Give declaration of structures. Explain structure within structure.
3. What is Union? Explain in detail.
4. Explain the Storage classes in c?

Short Answer Question

1. Write the difference between structure and union?
2. Write about Storage classes in C.
3. Write about Structure arrays give example?

MODULE-V

Essay Questions

1. Explain about Pointersin detail?
2. Explain about basic File operators in C?
3. Explain about pointer to functions with an example?
4. Explain about different types of Pointers in C?

Short Answer Question

1. Write about Pointers to arrays in C?
2. What is Dynamic Memory allocation?
3. Explain Read and Write data to file?

I B.Sc. – Computer Science / Semester- II (W.E.F. 2020-2021)

Course: DATASTRUCTURES USINGC

Course Code:C2

Total Hrs. of Teaching-Learning: 60 @ 4 h / Week Total Credits: 03

Objectives –

Tointroducethefundamentalconceptofdatastructuresandtoemphasizetheimportanceofvariousdata structuresindevelopingandimplementingefficientalgorithms.

Outcomes: Uponsuccessful completionofthecourse,astudentwillbeableto:

1. UnderstandavailableDataStructuresfordatastorageandprocessing.
2. Comprehend DataStructureandtheirreal-timeapplications-Stack,Queue,LinkedList,TreesandGraph
3. ChooseasuitableDataStructuresforanapplication
4. DevelopabilitytoimplementdifferentSortingandSearchmethods
5. Haveknowledgeon DataStructuresbasicoperationslikeinsert,delete,search, updateandtraversal
6. Designanddevelopprogramsusingvariousdatastructures
7. Implementtheapplicationsofalgorithmsforsorting,patternmatchingetc

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MODULE I: 12Hrs

a) **IntroductiontoDataStructures:**IntroductiontotheTheoryofDataStructures,DataRepresentation,AbstractDataTypes,DataTypes,PrimitiveDataTypes,DataStructureandStructuredType,AtomicType,DifferencebetweenAbstractDataTypes,DataTypes,andDataStructures,RefinementStages

b) **PrinciplesofProgrammingandAnalysisofAlgorithms:**SoftwareEngineering,ProgramDesign,Algorithms,DifferentApproachestoDesigninganAlgorithm,Complexity,Big‘O’Notation,AlgorithmAnalysis,StructuredApproachtoProgramming,Recursion,TipsandTechniques for WritingPrograms in ‘C’

MODULE II: 12Hrs

a) **Arrays:**IntroductiontoLinearandNon-LinearDataStructures,One-DimensionalArrays,ArrayOperations,Two-Dimensionalarrays,MultidimensionalArrays,PointersandArrays,anOverviewofPointers

b) **LinkedLists:**IntroductiontoListsandLinkedLists,DynamicMemoryAllocation,BasicLinkedListOperations,DoublyLinkedList,CircularLinkedList,AtomicLinkedList,LinkedListinArrays, Linked ListversusArrays

MODULE -III: HRS: 10

a) **Stacks:**IntroductiontoStacks,StackasanAbstractDataType,RepresentationofStacksthroughArrays,RepresentationofStacksthroughLinkedLists,ApplicationsofStacks,StacksandRecursion

b) **Queues:**Introduction,QueueasanAbstractdataType,RepresentationofQueues,CircularQueues,DoubleEndedQueues-Deques,PriorityQueues,ApplicationofQueues

MODULE -IV: HRS: 12

a) **Binary Trees:**IntroductiontoNon-LinearDataStructures,IntroductionBinaryTrees,TypesofTrees,BasicDefinitionofBinaryTrees,PropertiesofBinaryTrees,RepresentationofBinary Trees,OperationsonaBinarySearchTree,Binary TreeTraversal,CountingNumberofBinaryTrees,ApplicationsofBinaryTree

MODULE -V: **HRS: 12**

a) **Searchingandsorting:**Sorting– AnIntroduction,BubbleSort,InsertionSort,MergeSort,Quick sort Searching– AnIntroduction,Linearor SequentialSearch, BinarySearch,IndexedSequentialSearch.

b) **Graphs:**IntroductiontoGraphs,TermsAssociatedwithGraphs,SequentialRepresentationof Graphs,LinkedRepresentationofGraphs,TraversalofGraphs,SpanningTrees,Applicationof Graphs.

Prescribed Books:

1. "DataStructuresusingC", ISRDgroupSecond Edition,TMH
2. "DataStructuresthroughC",YashavantKanetkar,BPBPublications
3. "DataStructuresUsingC"BalagurusamyE.TMH

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. **Measurable**

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. **General**

1. Group Discussion

2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work

I B.Sc. – Computer Science / Semesters- II / Paper-II Syllabus
Practical Paper - II:
COURSE NAME:DATA STRUCTURE USING IN C
Course Code: C2

Practical/Laboratory-II
DATA STRUCTURE USING IN CMarks:50

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array

a. Add an element at the begging of an array

b. Insert an element at given index of array

c. Update a element using a values and index

d. Delete an existing element

2. Write a program using stacks to convert a given

a. postfix expression to prefix

b. prefix expression to postfix

c. infix expression to postfix

3. Write Programs to implement the Stack operations using an array

4. Write Programs to implement the Stack operations using Liked List.

5. Write Programs to implement the Queue operations using an array.

6. Write Programs to implement the Queue operations using Liked List.

7. Write a program for arithmetic expression evaluation.

8. Write a program for Binary Search Tree Traversals

9. Write a program to implement dequeue using a doubly linked list.

10. Write a program to search an item in a given list using the following Searching Algorithms

a. Linear Search

b. Binary Search.

11. Write a program for implementation of the following Sorting Algorithms

a. Bubble Sort

b. Insertion Sort

c. Quick Sort

12. Write a program for polynomial addition using single linked list

13. Write a program to find out shortest path between given Source Node and Destination Node in a given graph using Dijkstrar's algorithm.

14. Write a program to implement Depth First Search graph traversals algorithm

15. Write a program to implement Breadth First Search graph traversals algorithm

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT FOR THE YEAR 2022-2023
I B.SC (CS) 2022-2025 BATCH

Course: DATASTRUCTURES USINGC

Time : 2.30 Hrs. **SEMESTER-II** **Max. Marks:50**

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	**7**	**5**	**35**	**4**	**5**	**20**
2	Section-B Essay Questions	**6**	**10**	**60**	**3**	**10**	**30**
TOTAL		**13**		**95**	**TOTAL MARKS**		**50**

Percentage of choice given = $\frac{95-50}{95} \times 100 = \frac{45}{95} \times 100 = 47.36\%$

P.R.GOVT.COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPERS FOR THE YEAR 2022-2023
I B.Sc (CS) 2022-2025 BATCH
Computer Science Course: DATASTRUCTURES USINGC

Time: 2.30 Hrs. **SEMESTER-II** **Max. Marks: 50**

SECTION – A

Answer any FOUR Questions **4 x 5 = 20M**

1. Explain the Primitive Data Structures?
2. Explain about ADT?
3. Explain types of arrays?
4. Explain about Queue?
5. Explain about Tree implementations and applications.
6. Explain Minimal Spanning Trees?
7. Explain Insertion Sort.

SECTION – B

Answer all the Questions **3 x 10 =30 M**

8. A. What are the goals of Data structure? Write note on linear and Non Linear data structure with examples.

OR

B. What is Array? Explain about types of Arrays with syntax and suitable examples

9. A.What is a Linked list? Explain linked list in array.

OR

B. What is a stack? Explain the algorithm to create and delete items in stack.

10. A. What is Binary tree? Explain Binary tree traversal

OR

B. Explain Merge sort algorithm with an example?

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT FOR THE YEAR 2022-2023
I B.SC (CS) 2022-2025 BATCH

Course: DATASTRUCTURES USINGC

Course Code:C2

Time : 2.30 Hrs. **SEMESTER-II** **Max. Marks: 60**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
MODULE -I	1	2	20
MODULE -II	2	1	25
MODULE -III	1	1	15
MODULE– IV,V	2	3	35
Total No. of questions	6	7	
Total Marks Including choice			95

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT FOR THE YEAR 2022-2023
I B.SC (CS) 2022-2025 BATCH

Course: DATASTRUCTURES USINGC

Question Bank(W.E.F.2020-2021)

Course Code:C2

Subject: Data Structures Using C **Max.Marks:60**

MODULE I

Short Answer Questions

1. Explain asymptotic notation
2. Explain recursion in detail

Essay Questions:

1. What are the goals of data structure? Write note on linear and Non Linear data structure with examples.
2. Explain tips and techniques for writing programs in c

MODULE II

Short Answer Questions

1. Explain Multi dimensional arrays
2. Explain Dynamic memory allocation
3. Write the advantages and disadvantages of array and linked list.
4. Explain basic linked list operations

Essay Questions:

1. Explain double linked list implementation in C
2. Explain circular list implementation in C

Module III

Short Answer Questions

1. Explain Stack ADT
2. Explain Queue ADT
3. Explain Priority Queues?
4. Explain applications of queues?

Essay Questions:

1. What is a stack?Explain the algorithm to insert and delete items in a stack.
2. What is a queue?Explain the algorithm to create and delete items in aqueue.
3. Explain the applications of stack?

Module IV

Short Answer Questions

1. Explain about representation of a Binary Tree?
2. Explain Properties of a BinaryTrees?
3. Briefly explain Binary Tree Traversals?
4. Explain Operations on a BST?

Essay Questions:

1. Explain applications of Binary Tree?
2. Write an algorithm for delete operation on a BST?
3. Explain BST Traversals?

Module V

Short Answer Questions

1. Explain about Binary Searching.
2. Explain Insertion Sort.
3. Explain about Bubble Sort
4. Explain about Binary Search

Essay Questions:

1. Explain Merge sort algorithm with an example?
2. What is a Graph? Explain representations of a Graph
3. Briefly explain linear and binary search algorithms?

P.R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
I BSC (CS) 2022– 2025 BATCH
COURSE NAME: DATA STRUCTURES USING IN C
Course Code: C2
I B.Sc (CS) SEMESTER-II

SCHEME OF VALUATION (W.E.F. 2020-2021)

Time: **2** Hrs Marks: 100

Practical/Laboratory – II

1. Internal Practicals 50 Marks
2. External Practicals 50 Marks

Life Skills – 1

P R GOVT COLLEGE (A):: KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
BASIC COMPUTER APPLICATIONS(BCA)

SEMESTER-I (W.E.F 2020-21)

I B.A/B.Sc/B.Com (Common for All Degree)

I - Semester
(30 Hours of Teaching)

Objectives:

This course aims at providing exposure to students in skill development towards basic office applications.

Course Learning Outcomes:

After successful completion of the course, student will be able to:

1. Demonstrate basic understanding of computer hardware andsoftware.
2. Apply skills and concepts for basic use of acomputer.
3. Identify appropriate tool of MS office to prepare basic documents, charts, spreadsheets andpresentations.
4. Create personal, academic and business documents using MSoffice.
5. Create spreadsheets, charts andpresentations.
6. Analyze data using charts and spreadsheets.

Unit-I: (08 hrs)

Basics of Computers: Definition of a Computer - Characteristics of computers, Applications of Computers – Block Diagram of a Digital Computer – I/O Devices, hardware, software human ware, application software, system software, Memories - Primary, Auxiliary and CacheMemory.

MS Windows : Desktop, Recyclebin, My Computer, Documents, Pictures, Music,Videos,Task Bar, Control Panel.

Unit-II: (08 hrs)

MS-Word : Features of MS-Word - MS-Word Window Components - Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Mail Merge.

Unit-III: (10 hrs)

MS-Excel : Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Inserting Rows/Columns –Changing column widths and row heights, Formulae, Referencing cells , Changing font sizes and colors, Insertion of Charts, Auto fill, Sort.

MS-PowerPoint: Features of PowerPoint – Creating a Presentation - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures -Inserting Other Objects, Audio, Video - Resizing and scaling of an Object – Slide Transition – Custom Animation.

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

1. Assignments (in writing and doing forms on the aspects of syllabus content andoutside
    a. the syllabus content. Shall be individual andchallenging)
2. Student seminars (on topics of the syllabus and related aspects (individualactivity))
3. Quiz, GroupDiscussion
4. Solving MCQ's availableonline.
5. Suggested student hands onactivities:
    - Create two folders, Rename the folder, create two files each using notepad and paint, move the files from one folder to another folder, delete a file you have created, copy and paste text withinnotepad.
    - Create a letter head for your college with watermark, your resume, visiting card, brochure for your college activity, organization chart for your college, any advertisement, Prepare your Class timetable.
    - Prepare your mark sheet, Prepare your class time table, Prepare a salary bill for an organization, Sort the bill as per the alphabetical order of the names, Get online weather data and analyze it with variouscharts.
    - Create a PowerPoint presentation for a studentseminar.

REFERENCE BOOKS:

1. Working in Microsoft Office – Ron Mansfield -TMH.
2. MS Office 2007 in a Nutshell –Sanjay Saxena – Vikas PublishingHouse.
3. Excel 2020 in easy steps-Michael Price – TMHpublications

P.R. GOVT COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPER (W.E.F. 2020-21)
I B.A/B.Sc/B.Com (Common for All Degree)

SEMESTER –I

Sub: BASIC COMPUTER APPLICATIONS (BCA) **Paper: I**
Time: 2 hrs **Marks: 50**

SECTION – A

Answer any FOUR questions the following **4 x 5= 20 M**

1. Write about characteristics of Computer.
2. Explain Primary and Secondary memory devices.
3. Explain Desktop and Recycle bin.
4. Explain feature of MS-Word.
5. Explain header and Footer in MS-Word.
6. Explain feature of MS-Excel.
7. How to inserting Rows and Columns in MS-Excel
8. Explain features of MS-Power point.

SECTION – B

Answer any THREE questions the following **3 x 10= 30 M**

9. Draw and explain block diagram of Computer in details.
10. Explain various input and output devices.
11. Describe the features of MS Windows.
12. What is Mail-Merge? Explain Mail-Merge concept in MS-Word.
13. Explain the procedure how to create worksheets in MS Excel.
14. Explain Types of Views in MS-Power point.

* * *

P.R. GOVT COLLEGE (AUTONOMOUS), KAKINADA
QUESTION BANK (W.E.F. 2020-21)
I B.A/B.Sc/B.Com (Common for All Degree)

BASIC COMPUTER APPLICATIONS(BCA)

SEMESTER-I

QUESTION BANK

-UINT-I

Short Answer Questions:

1. Write about characteristics of Computer?
2. Explain various Applications of Computers?

Essay Answer Questions:

3. Discuss block diagram of Computer in details?
4. Explain various input and output devices?

UINT-II

Short Answer Questions:

1. Explain Primary and Secondary memory devices?
2. Explain Desktop and Recycle bin?

Essay Answer Questions:

3. Explain How to Creating Table in MS-Word?
4. What is Mail-Merge? Explain Mail-Merge concept in MS-Word?.

UINT-III

Short Answer Questions:

1. Explain feature of MS-Powerpoint?
2. How to inserting Rows and Columns in MS-Excel ?

Essay Answer Questions:

3. Explain the procedure how to create worksheets in MS Excel?
4. Explain how to create a presentation in MS Powerpoint?

* * *

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT (W.E.F. 2020-21)
I B.A/B.Sc/B.Com (Common for All Students)

BASIC COMPUTER APPLICATIONS(BCA)

SEMESTER -I

SUBJECT:BCA **Time: 2 Hrs**
PAPER- I **Marks: 50**

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	**8**	**5**	**40**	**4**	**5**	**20**
2	Section-B Essay Questions	**5**	**10**	**60**	**3**	**10**	**30**
TOTAL MARKS				**100**	**TOTAL MARKS**		**50**

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

MODEL BLUE PRINT (W.E.F. 2019-20)

I B.A/B.Sc/B.Com (Common for All Degree)

BASIC COMPUTER APPLICATIONS(BCA)

SEMESTER- I

SUBJECT:BCA Time: 2 Hrs

PAPER- I Marks :50

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
UNIT-I	2	3	35
UNIT-II	2	3	35
UNIT-III	2	2	30
Total No. of questions	6	8	
Total Marks Including choice			100

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

B.Sc./B.Com/B.A

Syllabus under CBCS w.e.f.2020-21

INFORMATION & COMMUNICATION TECHNOLOGY

Semester	Course Code	Course Title	Hours	Credits
II	**Life skill Course**	**INFORMATION & COMMUNICATION TECHNOLOGY**	**30**	**2**

Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course outcomes: After completion of the course, student will be able to;

1. Understand the literature of social networks and their properties.
2. Explain which network is suitable for whom.
3. Develop skills to use various social networking sites like twitter, flickr, etc.
4. Learn few GOI digital initiatives in higher education.
5. Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.
6. Get acquainted with internet threats and security mechanisms.

SYLLABUS:

UNIT-I: (08 hrs)

Fundamentals of Internet: What is Internet?, Internet applications,Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser – Types of Browsers,Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp .

UNIT-II:(08 hrs)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, MessageComposition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III:(10 hrs)

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-acharya, e-Yantra and NPTEL).

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

1. Assignments(in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
Quiz andGroup Discussion
3. Slip Test
4. Try to solve MCQ's available online.
5. Suggested student hands on activities :
a. Create your accounts for the above social networking sites and explore them, establish a video conference using Skype.
b. Create an Email account for yourself- Send an email with two attachments to another friend. Group the email addresses use address folder.
c. Register for one online course through any of the online learning platforms like NPTEL, SWAYAM, Alison, Codecademy, Coursera. Create a registration form for your college campus placement through Google forms.

Reference Books :

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e – byRaymond Greenlaw and Ellen Hepp, Publishers : TMH
2. Internet technology and Web design, ISRD group, TMH.
3. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

MODEL BLUE PRINT (W.E.F. 2020-2021)

B.Sc./B.Com/B.A

INFORMATION & COMMUNICATION TECHNOLOGY

SEMESTER-III

Time: 2 Hrs
PAPER- II **Marks: 50**

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	8	5	40	4	5	20
2	Section-B Essay Questions	6	10	60	3	10	30
TOTAL MARKS				100	TOTAL MARKS		50

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

MODEL BLUE PRINT (W.E.F. 2020-2021)

B.Sc./B.Com/B.A

INFORMATION & COMMUNICATION TECHNOLOGY

SEMESTER-III

Time: 2 Hrs **Marks: 50**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
UNIT-I	2	3	35
UNIT-II	2	3	35
UNIT -III	2	2	30
Total No. of questions	6	8	100

P.R.COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPER (W.E.F 2020-21)
B.Sc./B.Com/B.A

INFORMATION & COMMUNICATION TECHNOLOGY

SEMESTER-II

Sub: ICT **Paper: II**

Time: 2 hrs **Marks: 50**

SECTION – A

Answer any FOUR questions the following **4 x 5= 20 M**

1. Discuss briefly about advantages and disadvantages of Internet.
2. Explain about browsers.
3. What is URL? What are the Components of URL?
4. Explain about Email Addresses, Domain Names.
5. Explain about Google spread sheets.
6. Explain about Google forms.
7. What is a Computer Virus? Explain types of viruses.
8. What is Internet security?

SECTION – B

Answer any THREE questions the following **3 x 10= 30 M**

9. What is a Browser? Explain the different types of Browsers?
10. Explain about Social Networking sites with examples.
11. Define E-Mail. What are the advantages and disadvantages of E-mail?
12. Explain the Procedure for composing and sending an E-mail.
13. Discuss about Firewalls, Cryptography, Digital signatures.
14. Explain GOI digital initiatives in higher education.

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

QUESTION BANK (W.E.F. 2020-2021)

B.Sc./B.Com/B.A

INFORMATION & COMMUNICATION TECHNOLOGY

SEMESTER-II

QUESTION BANK

UNIT -I

Short Answer Questions:

1. Discuss briefly about advantages and disadvantages of Internet.
2. Explain about browsers.
3. What is URL? What are the Components of URL?
4. Explain about YouTube, WhatsApp.

Essay Answer Questions:

5. What is Internet? Explain about Internet applications.
6. What is a Browser? Explain the different types of Browsers?
7. Explain about Social Networking sites with examples.

UNIT-II

Short Answer Questions:

1. What are the advantages of E-mail?
2. Explain about Email Addresses, Domain Names.
3. Explain about Google spread sheets.
4. Explain about Google forms.

Essay Answer Questions:

5. Define E-Mail. What are the advantages and disadvantages of E-mail?
6. Explain the Procedure for composing and sending an E-mail.
7. Explain about G-Suite.

UNIT-III

Short Answer Questions:

1. What is a Computer Virus? Explain types of viruses.
2. What is Internet security?
3. Explain aboutE-mail threats.

Essay Answer Questions:

4. Discuss about Firewalls, Cryptography, Digital signatures.
5. Explain GOI digital initiatives in higher education.

II BSC

PR GOVT COLLEGE (A):: KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. (CS)-SEMESTER-III
Data Base Management System

Course Objective:

Design & develop database for large volumes & varieties of data with optimized data processing techniques.

Course Outcomes:

On completing the subject, students will be able to:

- Explain the basic concepts of databases, data models, database architecture and development steps.
- Design and implement properly structured databases that match the standards based under realistic constraints.
- Comprehend how to use Structured Query Language (SQL) to define and manipulate database information
- Write Relational Algebra and Relational Calculus queries
- Apply various Normalization techniques to improve database design.

UNIT I

Overview of Database Management System: Introduction, file-based system, Drawbacks of file-Based System, Data and information, Database, Database management System, Objectives of DBMS, Evaluation of Database management System, Classification of Database Management Systems, DBMS Approach, advantages of DBMS, data models, Components and Interfaces of Database Management System. Database Architecture, Situations where DBMS is not necessary.

UNIT II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, aggregation and composition, entity clusters, connection types, advantages of ER modeling.

UNIT III

Relational Model: Introduction, CODD Rules, relational data model, concept of key,

relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC).

Schema Refinement (Normalization): Purpose of Normalization or schema refinement,concept of functional dependency, normal forms based on functional dependency (1NF, 2NF and3 NF), Boyce-Codd normal form (BCNF)

UNIT IV

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Table Truncation, Imposition of Constraints, Join Operation, Set Operation, View, Sub Query, Embedded SQL.

UNIT V

PL/SQL: Introduction, Shortcoming in SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL Program, Iterative Control, Cursors, Steps to create a Cursors, Procedure, Function, Packages, Exceptions Handling, Database Triggers, Types of Triggers.

Additional Inputs:

Transaction management and Concurrency control: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, database recovery management.

Reference Books

1. "Database System Concepts" by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010,9780073523323
2. "Database Management Systems" by Raghu Ramakrishnan, McGrawhill,2002,
3. Fundamentals of Relational Database Management Systems by S. Sumathi,S. Esakkirajan, Springer Publications
4. "An Introduction to Database Systems" by Bipin CDesai
5. "Principles of Database Systems" by J. D.Ullman
6. "Fundamentals of Database Systems" by R. Elmasri and S.Navathe

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT (W.E.F. 2020-2021)
II B.Sc. (CS) SEMESTER-IV

SUBJECT: DATABASE MANAGEMENT SYSTEMS **Time: 2½ Hrs.**
PAPER- IV **Marks: 50**

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	**7**	**5**	**35**	**4**	**5**	**20**
2	Section-B Essay Questions	**6**	**10**	**60**	**3**	**10**	**30**
TOTAL MARKS				**95**	**TOTAL MARKS**		**50**

Percentage of choice given = $\frac{95-50}{95} \times 100 = \frac{45}{95} \times 100 = 47.36\%$

PR GOVT COLLEGE (A):: KAKINADA

DEPARTMENT OF COMPUTER SCIENCE
II B.Sc.(CS)-SEMESTER-III
Data Base Management System

Time: $2^{1/2}$Hrs **Max. Marks:50**

SECTION –I

Answer Any Four Questions **4 x 5 = 20M**

1. Explain roles and responsibilities of DBA?
2. Write about attribute classification in ER Model
3. What is week entity? Explain with suitable example.
4. Compare and contrast relational algebra and relational calculus.
5. Explain aggregate functions in SQL
6. Explain join operations in SQL
7. Explain conditional statements in PL/SQL

SECTION - II

Answer ALL questions **3 x 30M =30M**

8. a) What is data model? Explain different data models in DBMS.

   (OR)

   b) Explain components and interfaces of DBMS

9. a) What is E-R diagram? What are the building blocks of E-R diagram?

   (OR)

   b) Explain Codd's relational database rules

10. a) Explain about different joins in sql?

    (OR)

    b) Explain about PL/SQL block structure in detail?

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT (W.E.F. 2020-2021)
II B.SC (CS) SEMESTER-III
SUBJECT: Database Management Systems

Time: 2½ Hrs **Marks: 60**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
Module-1	2	1	25
Module-2	1	2	20
Module-3	1	1	15
Module-4	1	2	20
Module-5	1	1	15
Total No. of questions	6	7	
Total Marks Including choice			95

PR GOVT COLLEGE (A):: KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. (CS)-SEMESTER-III
Data Base Management System

QUESTION BANK

LONG ANSWER QUESTIONS:

UNIT-I

1. Explain about characteristics of file-based system? Write about drawbacks of file-based systems?
2. What is data model? Explain different data models in DBMS.
3. Explain about advantages and disadvantages of DBMS?
4. Explain about of classification of DBMS?
5. Explain about components and interfaces of DBMS?
6. Explain the three-level architecture of data base system?

UNIT-II

1. What do you mean by E-R-Model? Explain the degree of relationship in E-R-Model?
2. Write about generalization, specialization in E-R-Model?
3. What is E-R Diagram? What are the building blocks of E-R Diagram?

UNIT-III

1. Explain about Codd's relational data base rules?
2. Explain about relational operators in relational algebra?
3. What is integrity constraint? Explain different types of constrains in relational model?

UNIT-IV

4. Explain DDL, DML, and DCL in SQL?
1. Write about different joins in SQL?
2. Explain about views in SQL in detail?

UNIT-V

1. Explain about PL/SQL block structure in detail.
2. Explain about loop control structures in PL/SQL.
3. What is meant by a cursor? Explain implicit and explicit cursors with examples.

SHORT ANSWERS:

UNIT-I

1. Write about objectives of DBMS?

2. Write about roles and responsibilities of DBA?
3. Write about data Independence?

UNIT-II

1. write about attribute classification in E-R model?
2. What is week entity? Explain with suitable example.

UNIT-III

1. Explain about relation model?
2. What is Normalization? when it is used in RDBMS?
3. What is meant by a key? What are different types of keys available in relational model?

UNIT-IV

1. Explain different data types in SQL?
2. Write about select statement with example?
3. Write about aggregate function in SQL?

UNIT-V

1. Write about trigger?
2. Explain basic loops in PL/SQL.
3. Explain conditional statements in PL/SQL

PR GOVT COLLEGE (A):: KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. (CS)-SEMESTER-III
DATABASE MANAGEMENT SYSTEMSLAB

1. Draw ER diagrams for train services in a railway station

2. Draw ER diagram for hospital administration

3. Creation of college database and establish relationships between tables

4. Write a view to extract details from two or more tables

5. Write a stored procedure to process students results

6. Write a program to demonstrate a function

7. Write a program to demonstrate blocks, cursors & database triggers.

8. Write a program to demonstrate Joins

9. Write a program to demonstrate sub queries

10. Write a program to demonstrate of Aggregate functions

11. Creation of Reports based on different queries

12. Usage of file locking table locking, facilities in applications.

P R GOVT COLLEGE(A), KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

II B.Sc (CS) - Semester- IV (W.E.F. 2020-2021)

OBJECT ORIENTED PROGRAMMING USING JAVA

Total Hrs. of Teaching-Learning: 60 @ 4 h / Week **Total Credits: 03**

Objectives:

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object oriented programming concepts in Java.

Course Learning Outcomes: At the end of this course student will:

1. Understand the benefits of a well-structured program

2. Understand different computer programming paradigms

3. Understand underlying principles of Object-Oriented Programming in Java

4. Develop problem-solving and programming skills using OOP concepts

5. Develop the ability to solve real-world problems through software development in high-level programming language like Java

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UNIT – I

Introduction to Java: Features of Java, The Java virtual Machine, Parts of Java

Naming Conventions and Data Types: Naming Conventions in Java, Data Types in Java, Literals

Operators in Java: Operators, Priority of Operators

Control Statements in Java: if... else Statement, do... while Statement, while Loop, for Loop, switch Statement, break Statement, continue Statement, return Statement

Input and Output: Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String. format()

Arrays: Types of Arrays, Three Dimensional Arrays (3D array), arrayname.length, Command Line Arguments

UNIT – II

Strings: Creating Strings, String Class Methods, String Comparison, Immutability of Strings **Introduction to OOPs:** Problems in Procedure Oriented Approach, Features of Object- Oriented Programming System (OOPS)

Classes and Objects: Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors

Methods in Java: Method Header or Method Prototype, Method Body, Understanding Methods, Static Methods, Static Block, The keyword „this", Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods

Inheritance: Inheritance, The keyword „super", The Protected Specifier, Types of Inheritance

Additional Topics: wrapper classes, autoboxing ,unboxing

UNIT – III

Polymorphism: Polymorphism with Variables, Polymorphism using Methods, Polymorphism with Static Methods, Polymorphism with Private Methods, Polymorphism with Final Methods, final Class

Type Casting: Types of Data Types, Casting Primitive Data Types, Casting Referenced Data Types, The Object Class

Abstract Classes: Abstract Method and Abstract Class

Interfaces: Interface, Multiple Inheritance using Interfaces

Packages: Package, Different Types of Packages, The JAR Files, Interfaces in a Package, Creating Sub Package in a Package, Access Specifiers in Java, Creating API Document

UNIT – IV

Exception Handling: Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions, Re – throwing an Exception

Threads: Single Tasking, Multi Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Single Tasking Using a Thread, Multi Tasking Using Threads, Multiple Threads Acting on Single Object, Thread Class Methods, Deadlock of Threads,

Thread Communication, Thread Priorities, thread Group, Daemon Threads, Applications of Threads, Thread Life Cycle

UNIT – V

Streams: Stream, Creating a File using FileOutputStream, Reading Data from a File uingFileInputStream, Creating a File using FileWriter, Reading a File using FileReader, Zipping and Unzipping Files, Serialization of Objects, Counting Number of Characters in a File, File Copy, File Class

Java Database Connectivity: Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, , Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements, Using jdbc–odbc Bridge Driver to Connect to Oracle Database, , Retrieving Data from MS Access Database, Stored Procedures and CallableStatements, Types of Result Sets.

Prescribed Book:

1. E .Balaguru swamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.

Reference Books:

1. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TMH.

2. Deitel &Deitel. Java TM: How to Program, PHI (2007)

3. Java Programming: From Problem Analysis to Program Design- D.S Mallik

4. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)

5. Java complete reference.

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT (W.E.F. 2020-2021)
II B.Sc (CS) SEMESTER-IV

SUBJECT:OBJECT ORIENTED PROGRAMMING USING JAVA Time: 2½ Hrs
PAPER- IV Marks: 50

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	**7**	**5**	**35**	**4**	**5**	**20**
2	Section-B Essay Questions	**6**	**10**	**60**	**3**	**10**	**30**
TOTAL MARKS				**95**	**TOTAL MARKS**		**50**

Percentage of choice given = $\frac{95 - 50}{95} \times 100 = \frac{45}{95} \times 100 = 47.36\%$

P.R.GOVT.COLLEGE (AUTONOMOUS), KAKINADA

MODEL PAPER (W.E.F. 2020-2021)

II B.Sc (CS)

SUBJECT: OBJECT ORIENTED PROGRAMMING USING JAVA Time: 2½ Hrs

PAPER-IV Marks: 50

SEMESTER-IV

Section –A

Answer any Four questions 4 x 5 =20M

1. What are the Data types supported by Java?
2. Explain about Constructers in Java?
3. Explain types of Inheritance in Java?
4. Explain about Abstract Method and Abstract Classes?
5. Explain about File Input Stream and File Output Stream?
6. Explain about Thread priority?
7. Explain about JDBC?

Section –B

Answer All the questions 3x 30 = 30M

8. Explain the features of Java?

(OR)

. What is an Operator? Explain the Types of Operators in Java.

9. Explain about Object Oriented Principles?

(OR)

. Explain how Multiple Inheritance is implemented in Java?

10. Explain different types of jdbc drivers?

(OR)

Explain the Life cycle of Thread?

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT (W.E.F. 2020-2021)
II B.SC (CS)
SEMESTER-IV

SUBJECT:OBJECT ORIENTED PROGRAMMING USING JAVA **Time: 2½ Hrs**
PAPER : IV **Marks: 50**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
Module-1	2	1	25
Module-2	1	2	20
Module-3	1	1	15
Module-4	1	2	20
Module-5	1	1	15
Total No. of questions	6	7	
Total Marks Including choice			95

P R GOVERNMENT (AUTONOMOUS) COLLEGE, KAKINADA

QUESTION BANK (W.E.F. 2020-2021)

II B.Sc (CS)

SEMESTER-IV

OBJECT ORIENTED PROGRAMMING USING JAVA

QUESTION BANK

Module I

Short Questions: (5M)

1. What are the Data types supported by Java?
2. Explain about Java Virtual Machine?
3. Explain about Command Line Arguments?
4. Explain structure of a Java program?

Essay Questions: (10M)

5. Explain the features of Java?
6. What is an Operator? Explain types of Operators?
7. Explain about Control structures in Java?

Module II

Short Questions: (5M)

1. Explain about Constructors?
2. Explain types of inheritance?
3. Explain primitive data types in java?

Essay Questions: (10M)

4. Explain about object oriented principles?
5. Explain about access specifies in java?
6. Explain classes and methods in Java with examples?

Module III

Short Questions: (5M)

1. Explain about abstract methods and abstract classes?
2. Explain final classes and final methods?
3. Explain about types of errors?

Essay Questions: (10M)

4. Explain how multiple inheritance is implemented in java?
5. Explain how exceptional handling in done in java?
6. What is a package? Explain the process of creating and using packages?

Module IV

Short Questions: (5M)

1. Explain about access specifiers in java?
2. Explain thread priority?
3. Give applications of Threads?

Essay Questions: (10M).

1. Explain the lifecycle of thread?
2. Explain the process of creating and accessing packages?

Module V

Short Questions: (5M)

1. Explain about JDBC?
2. Explain FileInputStream and FileOutputStream classes?
3. Explain about serialization of objects?

Essay Questions: (10M)

1. Explain different types of jdbc drivers?
2. Explain the stages in JDBC program?
3. Explain about File Reader and File writer classes?

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

PRACTICALS (W.E.F. 2020—2021)
II B.Sc (CS) SEMESTER-IV

PRACTICAL SYLLABUS

OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Hours: 30 credits: 2

1. Write a program to read ***Student Name, Reg.No, Marks [5]*** and calculate ***Total***, ***Percentage, Result***. Display all the details of students

2. Write a program to perform the following String Operations

a. Read a string

b. Find out whether there is a given substring or not

c. Compare existing string by another string and display status

d. Replace existing string character with another character

e. Count number of works in a string

3. Java program to implements Addition and Multiplication of two N X N matrices.

4. Java program to demonstrate the use of Constructor.

5. Java program on Method Overloading and Method Overriding.

6. Java program on packages.

7. Java program for implementing Interfaces

8. Java program on Multiple Inheritance.

9. Java program on Multithreading

10. Java program to demonstrate the exception handlings

11. Javaprogram to demonstrate applets

12. Write a program to create ***Book (ISBN, Title, Author, Price, Pages, Publisher)***structure and store book details in a file and perform the following operations

a. Add book details

b. Search a book details for a given ISBN and display book details, if available

c. Update a book details using ISBN

d. Delete book details for a given ISBN and display list of remaining Books

PR GOVT COLLEGE (A):: KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc (CS)-SEMESTER-IV
OPERATING SYSTEM (PAPER-V)

Objectives:

This course aims to introduce the structure and organization of a file system. It emphasizes various functions of an operating system like memory management, process management, device management, etc.

Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Know Computer system resources and the role of operating system in resource management with algorithms
2. Understand Operating System Architectural design and its services.
3. Gain knowledge of various types of operating systems including Unix and Android.
4. Understand various process management concepts including scheduling, synchronization, and deadlocks.
5. Have a basic knowledge about multithreading.
6. Comprehend different approaches for memory management.
7. Understand and identify potential threats to operating systems and the security features design to guard against them.
8. Specify objectives of modern operating systems and describe how operating systems have evolved over time.
9. Describe the functions of a contemporary operating system

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling, Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, and Methods for Inter-process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer. Case studies: linux,windows

UNIT IV

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies– Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT V

File and I/O Management, OS security : Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Security Policy Mechanism, Protection, Authentication and Internal Access Authorization

Introduction to Android Operating System, Android Development Framework, Android Application Architecture, Android Process Management and File System,

REFERENCE BOOKS:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne (7^{th}Edition) Wiley India Edition.
2. Operating Systems: Internals and Design Principles by Stallings (Pearson)
3. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)
4. Online Resources for UNIT V

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ‟s available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva-Voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations.
10. Peers and self-assessment, outputs from individual and collaborative work.

Operating Systems Lab

Objectives:

• To use linux operating system for study of operating system concepts.
• To write the code to implement and modify various concepts in operating systems

Outcomes:

• The course objectives ensure the development of students applied skills in operating systems related areas.
• Students will gain knowledge in writing software routines modules or implementing various concepts of operating system.

List of Experiments:

1.Usage of following commands
Ls,pwd,tty,cat,who,who am I,rm, mkdir,rmdir,touch,cd.
2. Usage of following commands
Cal,cat(append),cat(concatenate),mv,cp,man,date.
3. Usage of following commands
Chmod,grep,tput(clear,highlight),bc.
4. Write a shell script to check if the number entered at the command line is Prime or not
5. Write a shell script to modify "cal" command to display calendars of the specified months.
6. Write a shell script to modify "cal" command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message "entered login name is invalid"
8. Write a shell script to display date in the mm/dd/yy format.
9. To implement the FCFS Algorithm.
10. To implement the shortest job First Algorithm.
11. To implement the priority algorithm.
12. To implement the round robin Algorithm.
13. To implement the FIFO page replacement algorithm

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT FOR THE YEAR 2022-2023
II B.SC (CS) 2022-2025 BATCH
SEMESTER-IV

SUBJECT:OPERATING SYSTEMS PAPER: V

Time : 2 ½ Hrs Max. Marks: 50

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Short Questions	**7**	**5**	**35**	**4**	**5**	**20**
2	Section-B Essay Questions	**6**	**10**	**60**	**3**	**10**	**30**
TOTAL		**15**		**95**	**TOTAL MARKS**		**50**

Percentage of choice given = $\frac{95 - 50}{95} \times 100 = \frac{45}{95} \times 100 = 47.36\%$

PR GOVT COLLEGE (A):: KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc(CS)-SEMESTER-IV
Paper-IV: Operating Systems

Time:2 ½ Hrs **Max. Marks: 50**

SECTION - I

Answer Any FOUR questions **4 x 5M= 20 M**

1. Explain Real Time System and Time sharing Operating System?
2. WriteaboutResourceAbstraction?
3. WriteabouttheProcessandtheProcessstate?
4. ExplainThreadingissues?
5. Write about somenecessaryandsufficientconditionsforDeadlock?
6. Explainabout Virtualmemory?
7. WriteaboutfileOperations?

SECTION - III

Answer ALL questions **3 x 10M = 30M**

8. a) WhatisOperatingSystem?ExplainfunctionsofOperatingSystem.
   (Or)
   b) Explain the various types of Operating System?

9. a) Explain about Process Scheduling Algorithms in detail?
   (Or)
   b) ExplainSystem ViewoftheProcessand Resource?

10. a) Explain about Deadlock Detection and recovery?
    (Or)
    b) . Explain about classical ProcessSynchronization problems?

11. a) Explain about Segmentation and Memory Allocation Strategies?
    (Or)
    b) ExplainAndroidDevelopmentFramework.

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA

MODEL BLUE PRINT FOR MODULE_WISE FOR THE YEAR 2022-2023

II B.SC (CS) 2022-2025 BATCH

Computer Science Course: Operating Systems

Time: 2.30 Hrs. **SEMESTER-IV** **Max. Marks: 50**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted to the chapter
MODULE -I	2	2	30
MODULE -II	2	2	30
MODULE -III	2	1	25
MODULE – IV,V	2	2	30
Total No. of questions	8	7	
Total Marks Including choice			115

P.R. GOVT. COLLEGE (A), KAKINADA
II B.Sc (CS) (W.E.F 2020-2021)
SEMESTER – IV

QUESTION BANK

Subject: Operating Systems Paper: V

MODULE-I

Essay Questions:

1. What is Operating system? Explain function of Operating System.
2. Explain various types of Operating Systems?
3. Explain about Multiprogramming System?

Short Questions:

4. Explain Resource Abstraction?
5. Explain about Process Control?
6. Explain Operation in Operating system?

MODULE-II

Essay Questions:

1. Explain about Process Scheduling Algorithms in detail?
2. Explain about System view of the Process and Resources?
3. Explain about System Call in detail?

Short Questions:

4. Explain CPU Scheduling?
5. What is Thread? Explain Threading Issues in OS?
6. What is Process? Explain Process State diagram in OS?
7. Explain about Preemptive Scheduling Algorithm?

MODULE-III

Essay Questions:

1. Explain about Deadlock Detection and recovery?
2. Explain about Classical Process Synchronization problem?
3. Explain about Deadlock concept in detail?

Short Questions:

4. Explain about Procedure-Consumer problem?
5. Explain about Reader-Writer problem?
6. Explain about Semaphores?

MODULE-IV

Essay Questions:

1. Explain about Paging in Memory Management?
2. Explain about Segmentation and Memory Allocation Strategies?
3. Explain about Virtual Memory in detail?

Short Questions:

4. What is Virtual memory and explain its advantages?
5. Explain about Segmentation?
6. Write about Fixed and Variable Partitions?

MODULE-V

Essay Questions:

1. Explain about File Access Methods?
2. Explain Android Development Framework?
3. Explain Android Application Architecture?

Short Questions:

4. Write about File Operations?
5. Explain about File System in Android?
6. Explain about Security policy Mechanism in file system?

III BSC

P.R.GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (SEMESTER-V)

Course 6A: Web Interface Designing Technologies (W.E.F 2022 – 23)
(Skill Enhancement Course (Elective), Credits: 05)

I. Learning Outcomes:

Students after successful completion of the course will be able to:

1. Understand and appreciate the web architecture and services.
2. Gain knowledge about various components of a website.
3. Demonstrate skills regarding creation of a static website and an interface to dynamic website.
4. Learn how to install word press and gain the knowledge of installing various plug in to use in their websites.

II. Syllabus :*(Total Hours: 90 including Teaching, Lab, and Field training, Uni tests etc.)*

Unit-I (10 hours)

HTML: Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, styles, colours, HTML formatting, Quotations, Comments, images, tables, lists, blocks, filepaths, layout, symbols, HTML responsive.

Unit– II (10 hours)

HTML forms: HTML form elements, input types, input attributes, HTML 5, HTML graphics, HTML media –video, audio.

CSS: CSS home, introduction, syntax, colours, background, borders, margins, padding,height/width, text, fonts, icons, tables, lists, position, over flow, float, CSS combinations,pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters.

Unit– III (10 hours)

Client side Validation: Introduction to JavaScript - What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript-Data and objects in JavaScript, regular expressions, exception handling. DHTML with JavaScript**-** Data validation, opening a new window, messages and confirmations, the status bar, different frames, rolloverbuttons,movingimages.

Unit– IV(10 hours)

Word press: Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.

Unit– V (10 hours)

Working with themes-parent and child themes, using featured images, configuring settings, user and user roles and profiles, adding external links, extending word press with plug-ins. Customizing the site, changing the appearance of site using css, protecting word press web site

from hackers.

III. References

1. Chris Bates,Web Programming Building Internet Applications, Second Edition, Wiley(2007)
2. Paul S.Wang SandaS.Katila, an Introduction to Web Design plus Programming,Thomson (2007).
3. Head First HTML and CSS,Elisabeth Robson, EricFreeman,O'ReillyMediaInc.
4. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R.Brooks.Springer, 2007
5. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
6. Word press for Beginners, Dr.Andy Williams.
7. Professional wordpress,BradWilliams,Daviddamstra,Hanstern.
8. Web resources:
    a. http://www.codecademy.com/tracks/web
    b. http://www.w3schools.com
    c. https://www.w3schools.in/wordpress-tutorial/
    d. http://www.homeandlearn.co.uk

IV. Co-Curricular Activities

a) **Mandatory:***(Training of students by teacher in field related skills:(lab: 10+field: 05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for not less than 15 hours on identifying the case study to build a website, designing the format, structure, menus, submenus etc for a web site and finally to build a website.

2. **For Student**: Students shall (individually) search online and visit any of the agencies like hotels, hospitals, super bazaars, organizations, etc. where there is a need for a website andidentifyanyonecasestudyandsubmitahand-writtenFieldwork/Projectwork/Projectwork/Projectwork/ProjectworkReportnotexceeding 10pages.Example:Choosingafirmor business to develop a website, identifying various business entities to be included in the website, identifying menu bar and content to be placed in their websites.

3. Max marks for Fieldwork/Project work/Project work/ Project work/Project work/ Project work Report: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work: *Title page, student details, index page, details of place visited, observations, findings and acknowledgements*.

5. Uni tests(IE).

b) Suggested Co-Curricular Activities

1. Builda website with10 pages for the case study identified.
2. Training of students by related industrial experts.
3. Assignments
4. Seminars, Group discussions, Quiz, Debates etc.(on related topics).
5. Presentation by students on best websites.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (SEMESTER-V)

Course6A:Web Interface Designing Technologies (W.E.F 2022 – 23)

MODEL PAPER BLUE PRINT

Blue Print

Chapter Name	Short Questions 5 Marks	Essay Questions 10 Marks	Marks allotted to the chapter
UNIT -I	1	2	25
UNIT -II	2	2	30
UNIT -III	1	2	25
UNIT -IV	1	1	15
UNIT -V	1	1	15
Total No. of questions	7	8	
Total Marks Including choice			110

P.R.GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE

MODEL QUESTION PAPER

Web Interface Designing Technologies (W.E.F 2022 – 23)

SEMESTER – V

Time: 21/2 Hrs **Max Marks: 60 M**

SECTION – I

Answer any **Four** of the following: 4**X5=20 M**

1. Explain anchor tag and image tag with examples?
2. Explain heading and formatting tags in HTML?
3. Discuss box layout in CSS?
4. Write any five string functions in JavaScript?
5. Write any five mathematical functions in JavaScript?
6. What is theme? How to apply themes in Word press?
7. Explain installing and configuring Word press?

SECTION –II

Answer any **Five** of the following: **4X10=40 M**

1. Explain List tags with examples?

   (OR)

   Explain FORM tag with various input elements along with examples?
2. Explain Table tag with examples?

   (OR)

   Explain CSS rules with examples?
3. Explain various types of CSS with examples?

   (OR)

   What is Widget? Explain how to add widgets in Word press?
4. Explain messaging in Java Script?

   (OR)

   Explain data time functions in Java Script with examples.

P.R.GOVERNMENT COLLEGE (A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (W.E.F 2022 – 23)

Course6A:Web Interface Designing Technologies

PRACTICAL SYLLABUS

I. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

1. Create a basic website with the help of HTML and CSS.
2. Acquire the skill of installing word press and various plugins of Wordpress.
3. Create a static website with the help of Wordpress.
4. Create an interface for a dynamic website.
5. Apply various themes for their websites using Wordpress.

II. Practical(Laboratory)Syllabus:*(30hrs.)*

HTML and CSS:

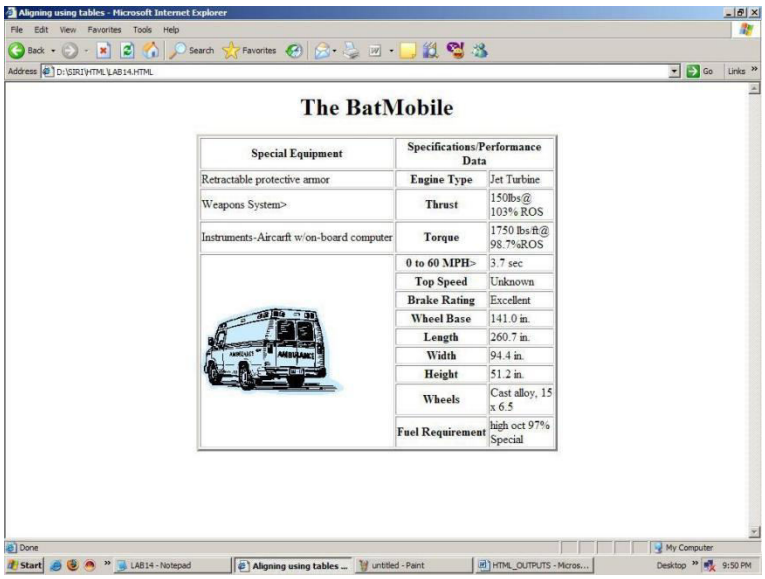
1. Create an HTML document with the following formatting options:
   (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e)Font(Type,SizeandColor),(f)Background(Coloredbackground/Imageinbackground),(g)Paragraph,(h)LineBreak,(i)Horizontal Rule,(j) Pretag

2. Create an HTML document which consists of:

   (a) Ordered List(b)Unordered List(c)Nested List (d)Image

3. Create a Table with four rows and five columns. Place an image in one column.
4. Using “table” tag, align the images as follows:

5. Create a menu form using html.
6. Style the menu buttons using css.
7. Create a form using HTML which has the following types of controls:
   (a) Text Box(b)Option/radio buttons(c) Checkboxes (d)Reset and Submit buttons
8. Design the page as follows:
   Create a webpage containing your biodata (assume the form and fields).



9. Write a html program including style sheets.
10. Write a html program to layers of information in webpage.

Wordpress:

11. Installation and configuration of word press.
12. Create a site and add a

theme.

13. Create a child theme

14. Add an external video link with size640X 360.
15. Create a user and assign a role to him.
16. Create a login page to word press using custom links

P.R.GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (W.E.F 2022 – 23)

Course 6A:Web Interface Designing Technologies

Question Bank

Short Questions (5 Marks)

UNIT-I

1. What is the difference between web applications and desktop applications?
2. Explain about heading tags and paragraph tag in HTML?
3. Write about structure of HTML with example?
4. How to add images to a web page using hyperlinks with example?

UNIT-II

1. Differentiate between HTML and HTML 5?
2. Explain about pseudo classes in CSS?
3. Explain about text formatting using CSS?
4. Differentiate between Check boxes and Radio button with example?

UNIT-III

1. Explain Data object in Java Script?
2. Explain Mathematical functions in Java Script?
3. What are the function? Explain how to create and called function.
4. Explain alert( ) ,confirm ( ) and prompt( ) methods of window objects?

UNIT-IV

1. Explain about Admin panel in Word press?
2. Differentiate between Post and pages?
3. Explain how to create a New blog Post in Word press?
4. Explain how to formatting headings, bullets and numbering in Word press?

UNIT-V

1. Explain about Parent and Child themes?
2. How to add external linking in Word press?
3. Explain about changing appearance of site using CSS?
4. Explain about user roles and profiles in Word press?

Essay Questions (10 Marks)

UNIT-I

1. Explain different Formatting tags in HTML?

2. Explain about types of List tag in HTML with example program?
3. Explain about Table related tags and attributes with example program?
4. Explain about Frames in detail with example program?

UNIT-II

1. Explain briefly about Forms with example program?
2. Explain about HTML APL'S?
3. What is CSS? Explain its types with examples.
4. Explain briefly about HTML Media?

UNIT-III

1. Explain about different Operators in Java Script?
2. Explain briefly about Data Validation in DHTML?
3. Explain about Exception handling with example?
4. Explain about Rollover buttons with example?

UNIT-IV

1. Explain features of Word Press?
2. Explain working with Media in Word Press?
3. Explain in detail about servers like wamp, bitnami?
4. Explain about working with Widgets and Menus?

UNIT-V

1. Explain briefly about themes?
2. Explain in detail about extending Word press with plug-ins?
3. Explain in detail about Protecting Word press web site from hackers?

P.R.GOVERNMENT COLLEGE(A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23) SEMESTER-V

Course 7A: Web Applications Development using PHP & MYSQL
(Skill Enhancement Course (Elective), Credits: 05)

I. Learning Outcomes:

Students after successful completion of the course will be able to:

1. Write simple programs in PHP.
2. Understand and how to use regular expressions, handle exceptions, and validate data using PHP.
3. Apply In-Built functions and Create User defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms.
5. Write programs to create dynamic and interactive web based applications using PHP and MYS QL.
6. Know how to use PHP with a MySQL database and can write database driven web pages.

II. Syllabus: (Total Hours: 90 including Teaching, Lab, and Field training, Unit tests etc.)

Unit-1: (10 hours)

The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments.

Unit-2: (10 hours)

Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Inheritance,**Working with Strings, Dates and Time**: Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

Unit-3: (10 hours)

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, and Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

Unit-4: (10 hours)

Working with Files and Directories: Including Files with inclue(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File

Unit-5: (10 hours)

Interacting with MySQL using PHP: Creating Databases and Table in MySQL,MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. Creating an Online Address Book: Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism.

III. References

1.Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).

2.Steven Holzner , PHP: The Complete Reference, McGraw-Hill

3.Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014

4.Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

5.Web resources:

e.http://www.codecademy.com/tracks/php

f.http://www.w3schools.com/PHP

g.http://www.tutorialpoint.com

IV.Co-Curricular Activities:

a)Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05) :

1.For Teacher: Field related training of students by the teacher in laboratory/field for not less than 15 hours on demonstrating various interactive and dynamic websites available online, addressing the students on identifying the case study to build an interactive and database driven website, forms to be used in website, database to be maintained, reports to be produced, etc.

2.For Student: Students shall (individually) search online and visit any of the agencies like malls, hotels, super bazaars, etc. where there is a need for an interactive and database driven website and submit a hand-written Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages. Example: Choosing a firm or business to develop a website, identifying forms to be placed in the websites, back end databases to be maintained and reports to be generated and placed in the websites.

3.Max marks for Fieldwork/Project work/Project work/Project work/Project work/Project work Report: 05.

4.Suggested Format for Fieldwork/Project work/Project work/Project work/Project work: Title page, student details, index page, details of place or websites visited, structure of the website and acknowledgements.

5.Unit tests.

b)Suggested Co-Curricular Activities

1.Arrange expert lectures by IT experts working professionally in the area of web content development

2.Assignments (in writing or implementing contents related to syllabus or outside the syllabus. Shall be individual and challenging)

3.Seminars, Group discussions, Quiz, Debates etc. (on related topics).

4.Preparation by students on best websites.

5.Arrange a webpage development competition among small groups of students.

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DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (SEMESTER-V)

MODEL PAPER BLUE PRINT

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Chapter Name	Short Questions 5 Marks	Essay Questions 10 Marks	Marks allotted to the chapter
UNIT -I	2	2	30
UNIT -II	1	2	25
UNIT -III	1	2	25
UNIT -IV	2	1	20
UNIT -V	1	1	15
Total No. of questions	7	8	
Total Marks Including choice			115

P.R.GOVERNMENT COLLEGE(A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (W.E.F 2022 – 23)

Course 7A: Web Applications Development using PHP & MYSQL– PRACTICAL SYLLABUS

V. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

1. Write, debug and implement the Programs by applying concepts and error handling techniques of PHP.
2. Create an interactive and dynamic website.
3. Create a website with reports generated from a database.
4. Write programs to create an interactive website for e-commerce sites like online shopping, etc.

VI. Practical (Laboratory) Syllabus: (30 hrs.)

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
9. Write PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add new Rows in a Table.
12. Write a PHP application to modify the Rows in a Table.
13. Write a PHP application to delete the Rows from a Table.
14. Write a PHP application to fetch the Rows in a Table.
15. Develop an PHP application to implement the user registration.
16. Write a PHP script to connect MySQL server from your website.
17. Write a program to read customer information like cust-no, cust-name, item- purchased, and mob-no, from customer table and display all these information in table format on output screen.
18. Write a program to edit name of customer to "Kiran" with cust-no =1, and to delete record with cust-no=3.
19. Write a program to read employee information like emp-no, emp-name, designation and salary from EMP table and display all this information using table format in your website.

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III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23
MODEL QUESTION PAPER

Course 7A: Web Applications Development using PHP & MYSQL
SEMESTER – V

Time: 2 1/2 Hrs **Max Marks: 60 M**

SECTION – I

Answer any **Four** of the following: 4**X5=20 M**

1. List data types in PHP
2. Discuss repetition statements in PHP.
3. Discuss String functions in PHP.
4. Discuss array related functions in PHP
5. Demonstrate a simple FORM data submission in PHP.
6. Explain MySQL database related commands
7. Explain joins in MySQL

SECTION –II

Answer ALL of the following: **4X10=40 M**

1. Demonstrate variable scopes in PHP.
   (OR)
   Define function? Demonstrate function with example in PHP.

2. Discuss various types of arrays in PHP with examples.
   (OR)
   Discuss Date Time functions in PHP.

3. Discuss about session usage in PHP.
   (OR)
   Explain in detail about cookies and cookie related function in PHP.

4. Explain file creation and reading in PHP.
   (OR)
   Write PHP script to list data from database table

PHP Question Bank

UNIT – I

Short Answer Questions (5Marks):

1. List data types in PHP
2. What are the differences between PHP constants and variables?
3. Explain switch statement with example in PHP

Essay questions (10 Marks):

4. Demonstrate variable scopes in PHP.
5. Define function? Demonstrate function with example in PHP.
6. what is operator? Explain different types of operators in PHP
7. Explain Iterative/loop statements in PHP.

UNIT – II

Short Answer Questions (5Marks):

1. How are objects created in PHP explain using example?
2. Explain any five Date and Time Functions in PHP
3. Explain any five array related functions in PHP.

Essay questions (10 Marks):

4. What is an array? Explain different types of arrays in PHP
5. Discuss String functions in PHP.
6. What is inheritance? Explain inheritance in PHP.

UNIT – III

Short Answer Questions (5Marks):

1. How do we combine HTML and PHP code?
2. What is session? Explain briefly.
3. How to redirect user to another page in PHP?

Essay questions (10 Marks):

4. Explain how we can send a mail on form submission in PHP?
5. What are cookies? Explain how can you create, access, and delete a cookie in PHP with the help of an example?

6. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.

UNIT – IV

Short Answer Questions (5Marks):

1. Explain PHP fopen() function in detail.
2. Explain file opening modes in PHP.
3. Explain include() function in PHP

Essay questions (10 Marks):

4. Explain file creation and writing data to it with the help of an example PHP script.
5. Explain how can we upload files to server in PHP

UNIT – V

Short Answer Questions (5Marks):

1. What are the advantages of using MySQLi over MySQL?
2. Explain joins in MySQL
3. Write a program to connect PHP with MySQL.

Essay questions (10 Marks):

4. Explain following MySQL commands with example queries

   i) Select ii) Delete iii) Update and iv) insert

5. Write a PHP script to insert records in student table with in the Course database having fields – **student id, student name, student age** through Form and display records in table format.
6. Write a PHP script to update MySQL data using PHP?

P.R.GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc COMPUTER SCIENCE (W.E.F 2022 – 23)
Course6B:INTERNET OF THINGS
(Skill Enhancement Course(Elective),Credits:05)

I. LearningOutcomes: Studentsaftersuccessfulcompletionofthecoursewillbeableto:

1. Appreciate the technology for IoT
2. Understand various concepts ,terminologies and architectureof IoT systems.
3. Understand various applications of IoT
4. Learn how to use various sensors andactuatorsfordesignofIoT.
5. Learnhowtoconnectvariousthingsto Internet.
6. LearntheskillstodevelopsimpleIOTDevices.

II. **Syllabus:***(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

Unit-I (10 hours)

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures,Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, AboutThings in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT andM2M.

ApplicationsofIoT: HomeAutomation,SmartCities,Energy,RetailManagement,Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT designEthics,IoT in Environmental Protection.

Unit-II (10 hours)

SensorsNetworks:Definition,TypesofSensors,TypesofActuators,ExamplesandWorking,IoTDevelopmentBoards:ArduinoIDEandBoardTypes,RaspberriPiDevelopment Kit, RFID Principles and components, Wireless Sensor Networks: History andContext,Thenode, Connectingnodes, NetworkingNodes, WSN andIoT.

Unit-III (10 hours)

WirelessTechnologiesforIoT:WPANTechnologiesforIoT:IEEE802.15.4,Zigbee,HART,NFC, Z-Wave,BLE,BacnetAnd Modbus.

IPBasedProtocolsforIoTIPv6,6LowPAN,LoRA,RPL,REST,AMPQ,CoAP,MQTT.Edgeconnectivityandprotocols.

Unit-IV(10 hours)

Arduino Simulation Environment: Arduino Uno Architecture, Setting up the IDE, WritingArduino Software,Arduino Libraries,Basics of Embedded C programming for Arduino,InterfacingLED,pushbuttonandbuzzerwithArduino,InterfacingArduino withLCD.

Sensor&ActuatorswithArduino:OverviewofSensorsworking,AnalogandDigitalSensors,Interfacingof Temperature,Humidity,Motion,LightandGasSensorswithArduino,Interfacing of Actuators with Arduino,Interfacing of Relay Switch and ServoMotorwith Arduino.

Unit-V(10 hours)

Developing IOT's:Implementation of IoT with Arduino, Connecting and using various IoTCloud Based Platforms such as Blynk, Thingspeak, AWS IoT, Google Cloud IoT Core etc.CloudComputing, FogComputing, PrivacyandSecurityIssues inIoT.

III. References

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti,UniversitiesPress, 2015, ISBN: 9788173719547
2. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1stEdition, VPT, 2014
3. DanielMinoli,—"BuildingtheInternetofThingswithIPv6andMIPv6:TheEvolving WorldofM2MCommunications",ISBN:978-1-118-47347-4,WillyPublications
4. PethuruRajandAnupamaC.Raman,"TheInternetofThings:EnablingTechnologies,Platforms,and UseCases", CRCPress
5. Opensourcesoftware/learningwebsites
    a. https://github.com/connectIOT/iottoolkit
    b. https://www.arduino.cc/
    c. https://onlinecourses.nptel.ac.in/noc17_cs22/course
    d. http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html
    e. Contiki(OpensourceIoToperatingsystem)
    f. Ardudroid(opensourceIoTproject)
    g. https://blynk.io(Mobileapp)
    h. IoTToolkit (smartobjectAPIgatewayservicereferenceimplementation)

IV. Co-CurricularActivities:

a) **Mandatory:***(Trainingofstudents byteacher in fieldrelatedskills:(lab: 10+field: 05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on identifying the case study for the IoT,design an IoT solution,buildphysicalIoT device,connect itto amobileapp anddeploytheIoTdevice.

2. **For Student**: Students shall (individually) search online and visit any of the places likeaquaculture farms, agencies using IOT devices, etc to identify problems for IoT solution andsubmitahand-writtenFieldwork/Projectwork/Projectwork/Projectwork/ProjectworkReport not exceeding 10 pages. Example: Choosing a Problem for IoT solution (agriculture,aquaculture, smart home appliances, testing moisture levels, oxygen levels, etc), reasons whyIoTsolutionisfeasibleforthesaidproblem,materialrequired,Designandarchitectureforth eproposedIoTdevice,methodofimplementationandhowtoconnect the devicetomobile.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Titlepage,studentdetails,indexpage,detailsofwebsitessearched,placevisited,observations, findings, proposed IOT problem, and design of the IOT device, implementationandacknowledgements*.
5. Unittests(IE).

b) SuggestedCo-CurricularActivities

1. Trainingof students byrelated industrial experts.
2. Assignments
3. Preparation and presentation of power-point slides, which include videos, animations,pictures,graphics,etc bythe students.
4. Seminars,Groupdiscussions,Quiz,Debatesetc.(onrelatedtopics).
5. Fieldvisitsto identifytheproblems forIoTsolutions.

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)
MODEL QUESTION PAPER

Course 6B: InternetofThings
SEMESTER – V

Time: 21/2 Hrs **Max Marks: 60 M**

SECTION – I

Answer any **Four** of the following: 4**X5=20 M**

1. What is the Internet of Things (IoT)? Explain the characteristics of IoT
2. What are the advantages of IoT?
3. Write short notes on Arduino function libraries.
4. Write a shot note on RFID.
5. What are the wireless sensor networks?
6. What are Wireless technologies for the IoT?
7. Explain AWS IOT

SECTION –II

Answer ALL of the following: **4X10=40 M**

1. Explain about design objectives of IoT architecture?(OR)

   Explain various types of Sensors.

2. Explain about Wireless Technologies for the IoT(OR)

   What are the difference between Real Time and Local Analytics?

3. Explain about Data Handling and Analytics.(OR)

   Explain various IoT Applications.

4. Explain the Legal challenges in IoT.(OR)

   Explain various Identifiers in IoT? Explain about Frameworks in IoT?

P.R.GOVERNMENT COLLEGE(A),KAKINADA

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III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

Course6B:InternetofThings
PRACTICALSYLLABUS

V. LearningOutcomes:

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto:

1. Acquiretheskillsto designasmallIoTdevice.
2. Connectvarioussensors, actuators,etctoArduinoboard.
3. Connectthethingsto Internet
4. Designasmallmobile apptocontrol thesensors.
5. Deployasimple IoTdevice.

VI. Practical(Laboratory)Syllabus:*(30hrs)*

1. UnderstandingArduinoUNOBoardandComponents
2. InstallingandworkwithArduino IDE
3. BlinkingLEDsketchwithArduino
4. Simulationof4-WayTrafficLightwithArduino
5. UsingPulse Width Modulation
6. LEDFadeSketchand ButtonSketch
7. Analog InputSketch(BarGraphwith LEDs andPotentiometre)
8. DigitalRead Serial Sketch (Workingwith DHT/IR/Gas or AnyotherSensor)
9. WorkingwithAdafruitLibrariesinArduino
10. SpinningaDC Motorand Motor SpeedControl Sketch
11. WorkingwithShields
12. Design APP usingBlinkApporThingspeakAPIandconnectitLEDbulb.
13. Design APP UsingBlynk AppandConnecttoTemperature,magneticSensors.

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III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

Course7B: APPLICATION DEVELOPMENT USING PYTHON
(Skill Enhancement Course (Elective),Credits:05)

I. **LearningOutcomes:** Students after successful completionofthecoursewillbeableto:

1. Understandandappreciatetheweb architectureandservices.
2. ExaminePythonsyntaxandsemanticsandbefluentintheuseofPythonflowcontrolandfunctions.
3. DemonstrateproficiencyinhandlingStringsandFileSystems.
4. Create,runandmanipulatePythonProgramsusingcoredatastructureslikeLists,Dictionariesand useRegularExpressions.
5. Interpretthe conceptsofObject-OrientedProgrammingasusedinPython.
6. ApplyconceptsofPythonprogramminginvariousfieldsrelatedtoIOT,WebServicesand Databases in Python.

II. **Syllabus:***(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

Unit-I (10 hours)

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types, InternalTypes,StandardTypeOperators,StandardTypeBuilt-inFunctions,CategorizingtheStandardTypes, Unsupported Types

Numbers-
IntroductiontoNumbers,Integers,FloatingPointRealNumbers,ComplexNumbers,Operators,Built-in Functions, RelatedModules

Sequences-Strings, Lists,andTuples,MappingandSetTypes

Unit– II (10 hours)

Files: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-inAttributes, Standard Files, Command-line Arguments, File System, File Execution, PersistentStorageModules, Related Modules

Exceptions: ExceptionsinPython,DetectingandHandlingExceptions,ContextManagement, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions,Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and thesysModule, Related Modules

Modules: ModulesandFiles,Namespaces,ImportingModules,ImportingModuleAttributes, ModuleBuilt-in Functions,Packages,Other Features ofModules

Unit– III (10 hours)

RegularExpressions: Introduction,SpecialSymbolsandCharacters,ResandPythonMultithr eaded Programming: Introduction, Threads and Processes, Python, Threads, and theGlobalInterpreter Lock,Thread Module,ThreadingModule, RelatedModules

Unit– IV(10 hours)

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of OtherGUIs,Related Modulesand Other GUIs

Web Programming: Introduction, Wed Surfing with Python, Creating Simple Web Clients,AdvancedWebClients,CGI-HelpingServersProcessClientData,BuildingCGIApplication,Advanced CGI, Web (HTTP) Servers

Unit– V(10 hours)

DatabaseProgramming: Introduction,PythonDatabaseApplicationProgrammer'sInterfac e (DBAPI), ObjectRelational Managers(ORMs), Related Modules

III. References

1. **C**orePython Programming,WesleyJ. Chun,Second Edition, Pearson.
2. ThinkPython,AllenDowney,GreenTeaPress.
3. IntroductiontoPython, KennethA. Lambert,Cengage.
4. PythonProgramming:A ModernApproach,VamsiKurama,Pearson.
5. LearningPython,Mark Lutz,O'Really.
6. Websourcessuggestedbytheteacherconcernedandthecollegelibrarianincludingre adingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:***(Trainingofstudentsbyteacherinfieldrelatedskills:(lab: 10+field:05)*

1. **For Teacher**: Training of students by the teacher in laboratory/field for not less than 15hourson field related skills likebuildinganIOTdevicewith thehelp of Python.

2. **For Student**: Students shall (individually) identity the method to link their IOT projectdone in Paper 7A with Python and submit a hand-written Fieldwork/Project work/Projectwork/Project work/Project work Report not exceeding 10 pages. It should include a briefreport on the selected case study of IOT device, algorithm and Python program to operate theIOTdevice.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, design of the IOT device, implementation of Pythonprogramto connect theIOT device,findingsand acknowledgements*.

5. Unittests(IE).

b) SuggestedCo-CurricularActivities

1. Trainingof students byrelated industrial experts.

2. Assignments

3. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).

4. Presentationbystudentsonbest websites.

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DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (SEMESTER-V)

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Chapter Name	Short Questions 5 Marks	Essay Questions 10 Marks	Marks allotted to the chapter
UNIT -I	2	2	30
UNIT -II	1	2	25
UNIT -III	1	2	25
UNIT -IV	2	1	20
UNIT -V	1	1	15
Total No. of questions	7	8	
Total Marks Including choice			115

P.R.GOVERNMENT COLLEGE(A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

MODEL QUESTION PAPER

Course 7B: ApplicationDevelopmentUsingPython
SEMESTER – V

Time: 21/2Hrs **Max Marks: 60 M**

SECTION-I

I. Answer any FOUR questions (5 X 4 = 20 marks)

1. Explain different features of pyhton programming language.
2. Explain the structure of a python program.
3. Explain the concept of constructor.
4. Explain the structure to create and access a package.
5. Create simple web client in Python.
6. Write short note on List and Tuples.
7. Explain loops in python

SECTION-II

II. Answer ALL questions (4 X 10 = 40 marks)

1. Explain different data types in python.(OR)
   Explain control statements with examples.
2. Explain the structure of a function with one example.(OR)
   Explain class concept with one example.
3. Explain the concept of Thread creation in Python with example.(OR)
   Explain different types of inheritance.
4. Explain in detail about ORM in Python.(OR)
   Explain about Exception handling in Python.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

Course7B: ApplicationDevelopmentUsingPython–
PRACTICALSYLLABUS

V. **LearningOutcomes:**

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto:

1. ImplementsimpleprogramsinPython

2. Implementprogramsrelatedtovariousdatastructureslikelists,dictionaries,etc.

3. Implementprogramsrelatedtofiles.

4. Implement applicationsrelatedtodatabases,Webservicesand IOT.

VI. **Practical(Laboratory)Syllabus**:*(30hrs.*)

1. Write a menu driven program to convert the given temperature from Fahrenheit toCelsiusand viceversadependingupon user'schoice.

2. Write a python program to calculate total marks, percentage and grade of a student.Marks obtained in each of the three subjects are to be input by the user. Assign gradesaccordingto thefollowingcriteria:

   GradeA:Percentage>=80

   Grade B: Percentage>=70 and <80Grade C: Percentage>=60 and <70Grade D: Percentage>=40 and <60GradeE: Percentage<40

3. Writeapython programtodisplaythefirst ntermsofFibonacciseries.

4. Writeapythonprogramtocalculatethesumandproductoftwo compatible matrices.

5. Write a function that takes a character and returns True if it is a vowel and Falseotherwise.

6. Writeamenu-drivenprogramtocreatemathematical3Dobjects

I. curve

II. sphere

III. cone

IV. arrow

V. ring

VI. Cylinder.

7. Writeapython programto readn integersanddisplaythemas ahistogram.
8. Writeapythonprogram todisplaysine,cosine, polynomialandexponentialcurves.
9. Write a python program to plot a graph of people with pulse rate p vs. height h. ThevaluesofP and H aretobeentered bythe user.
10. Write a python program to calculate the mass m in a chemical reaction. The mass m(in gms) disintegrates according to the formula m=60/ (t+2), where t is the time inhours.Sketch agraph fort vs. m, wheret>=0.
11. A population of 1000 bacteria is introduced into a nutrient medium. The population pgrowsas follows:

    P(t) =(15000(1+t))/ (15+*e)*

12. Where the time t is measured in hours. WAP to determine the size of the population atgiventimet andplot agraph forP vs tforthe specified timeinterval.
13. Input initial velocity and acceleration, and plot the following graphs depictingequationsof motion:

    I. velocitywrt time (v=u+at)

    II. distancewrttime(s=u*t+0.5*a*t*t)

    III. distancewrt velocity(s=(v*v-u*u)/2*a)

14. Write a program that takes two lists and returns True if they have at least one commonmember.
15. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and5th elements.
16. Writeaprogramtoimplementexceptionhandling.

17. Trytoconfigurethewidgetwithvariousoptionslike:bg=”green”,family=”times”,size=20.
18. WriteaPython programto readlast 5linesofafile.
19. Design asimpledatabase applicationthatstorestherecordsandretrievethe same
20. Design adatabaseapplicationtosearchthespecifiedrecordfromthedatabase.
21. Designadatabaseapplicationtothatallowstheusertoadd,deleteandmodifytherecords.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

Course6C:DATA SCIENCE
(SkillEnhancementCourse(Elective),Credits:05)

I. **LearningOutcomes:**Studentsaftersuccessfulcompletionofthecoursewillbeableto:

1. Developrelevantprogrammingabilities.
2. Demonstrateproficiencywithstatisticalanalysisofdata.
3. Developtheabilityto build and assess data-basedmodels.
4. Demonstrateskillindata management
5. Apply data science concepts and methods to solve problems in real-world contextsandwill communicate thesesolutions effectively

II. **Syllabus:**(*(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

UNIT-I (10hours)

Introduction: The Ascendance of Data, What is Data Science? , Finding key Connectors,Data Scientists You May Know, Salaries and Experience, Paid Accounts, Topics of Interest,Onward.

Python: Getting Python, The Zen of Python, Whitespace Formatting, Modules, Arithmetic,Functions, Strings, Exceptions, Lists, Tuples, Dictionaries, Sets, Control Flow, Truthiness,Sorting, List Comprehensions, Generators and Iterators, Randomness, Object – OrientingProgramming, Functional Tools, enumerate, zip and Argument Unpacking, args and kwargs,Welcometo DataSciencester!

VisualizingData:matplotlib,Barcharts, Linecharts,Scatterplots.

LinearAlgebra: Vectors,Matrices

UNIT-II(10 hours)

Statistics: Describing a Single Set of Data, Correlation, Simpson's Paradox, some OtherCorrelationCaveats, Correlation and Causation.

Probability: DependenceandIndependence,ConditionalProbability,Bayes'sTheorem,Random Variables, Continuous Distributions, The Normal Distribution, The Central LimitTheorem.

HypothesisandInference: StatisticalHypothesisTesting,Example:FlippingaCoin,Confidence Intervals,P-hacking,Example:RunninganA/BTest,BayesianInference.

Gradient Descent: The Idea behind Gradient Descent, Estimating the Gradient, Using theGradient,ChoosingtheRightStepSize,PuttingItAllTogether,Stochastic GradientDescent.

UNIT-III(10 hours)

Getting Data: stdin and stdout, Reading Files – The Basics of Text Files, Delimited Files,Scraping the Web -HTML and the parsing Thereof, Example: O'Reilly Books About Data,UsingAPIs –JSON(and XML),Using anUnauthenticated API,FindingAPIs.

WorkingwithData:ExploringYourData,ExploringOne-DimensionalData,TwoDimensionsManyDimensions,CleaningandMunging,Manipulating Data,Rescaling,DimensionalityReduction.

MachineLearning: Modeling,WhatIsMachineLearning?Overfittingandunderfitting,Correctness,TheBias-VarianceTrade-off, FeatureExtractionand Selection

UNIT-IV(10 hours)

K-Nearest Neighbors: The Model, Example: Favorite Languages, TheCurseofDimensionality.

NaiveBayes:AReallyDumbSpamFilter,AMoreSophisticatedSpamFilter,Implementation,TestingOurModel.

SimpleLinearRegression: TheModel,UsingGradientDescent,MaximumLikelihoodEstimation.

MultipleRegression: TheModel,FurtherAssumptionsoftheLeastSquaresModel,FittingtheModel,InterpretingtheModel, Goodness ofFit.

UNIT-V(10hours)

Logistic Regression: The Problem, The Logistic Function, Applying the Model, Goodness ofFitSupport Vector Machines.

DecisionTrees: WhatIsaDecisionTree?Entropy,TheEntropyofaPartition,CreatingaDecision Tree, Putting ItAll Together,Random Forests.

NeuralNetworks: Perceptron,Feed-ForwardNeuralNetworksAndBackpropagation,Example:DefeatingaCAPTCHA.

Clustering: TheIdea,TheModel,Example:Meetups,Choosingk,Example:ClusteringColors,Bottom-up Hierarchical Clustering.

III. References

1. DataSciencefrom Scratch byJoel GrusO'ReillyMedia
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy,andIPython", O'Reilly,2nd Edition, 2018.
3. JakeVanderPlas,"PythonDataScienceHandbook:EssentialToolsforWorkingwithData",O'Reilly, 2017.
4. Webresources:
    a. https://www.edx.org/course/analyzing-data-with-python
    b.http://math.ecnu.edu.cn/~lfzhou/seminar/[Joel_Grus]_Data_Science_from_Scratch_First_Princ.pdf
5. 9.Other web sources suggested by the teacher concerned and the college librarianincludingreadingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:** *(Trainingofstudentsbyteacher infieldrelatedskills:(lab:10+field:05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on identifying, analyzing and presenting the data and then to predict thefutureinstances.

2. **For Student**: Students shall (individually) search online and visit any of the agencies likeStatisticalcell,weatherforecastingcenters,pollutioncontrolboards,manufacturingindustries, agriculture departments, etc. to observe the manual process going on to collect thedata, maintain the data, present the data and to predict the data for future instances and submita hand-written Fieldwork/Project work/Project work/Project work/Project work Report notexceeding10 pages.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, details of place visited, observations, findings andacknowledgements*.

5. Unittests.

b) SuggestedCo-CurricularActivities

1. Trainingof students byrelated industrial experts.

2. Assignments

3. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).

4. Presentationbystudents inrelatedtopics.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE (SEMESTER-V)

MODEL PAPER BLUE PRINT

Blue Print

Chapter Name	Short Questions 5 Marks	Essay Questions 10 Marks	Marks allotted to the chapter
UNIT -I	2	2	30
UNIT -II	1	2	25
UNIT -III	1	2	25
UNIT -IV	2	1	20
UNIT -V	1	1	15
Total No. of questions	7	8	
Total Marks Including choice			115

P.R.GOVERNMENT COLLEGE(A),KAKINADA

DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

MODEL QUESTION PAPER

Course 6C: Data Science
SEMESTER – V

Time: 21/2 Hrs **Max Marks: 60 M**

SECTION – I

Answer any **Four** of the following: 4**X5=20 M**

1. Write short note on List, Tuple, Dictionary
2. Explain about Normal Distribution.
3. Differentiate Overfitting and Underfitting
4. Write KNN algorithm
5. Explain Clustering and its applications.
6. Discuss Logistic regression
7. Explain classification

SECTION –II

Answer ALL of the following: **4X10=40 M**

1. Explain Data visualization in Python with example.(OR)
   Explain Bayes Theory with an example.
2. Discuss Multiple Regression.(OR)
   Explain Decision Tree with an example.
3. Justify the need for Dimensionality Reduction.(OR)
   What is Feature Selection? How to perform Feature Selection.
4. What is the process of Statistical hypothesis testing.(OR)
   What is Gradient descent? How to estimate Gradient descent?

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III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

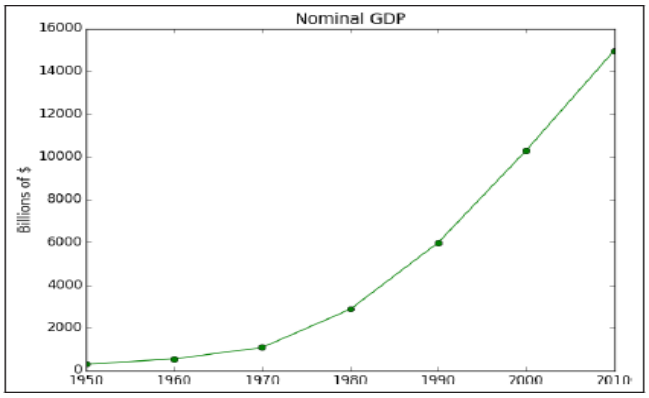
Course6C:DataScience –PRACTICAL SYLLABUS

V. **Learning Outcomes:** On successful completion of this practical course, student shall beable to:

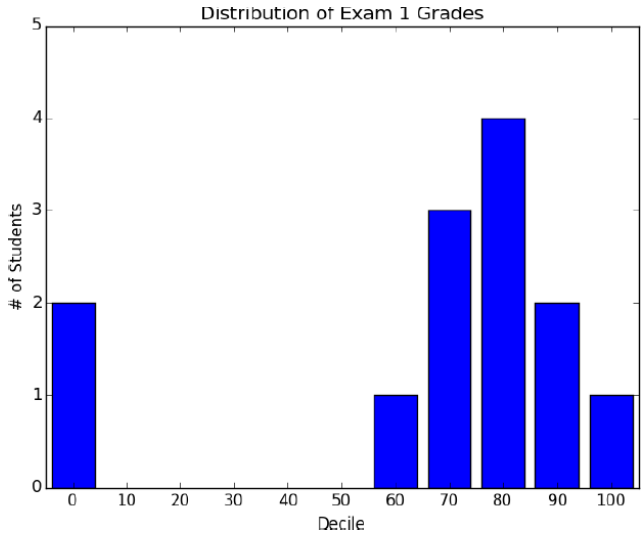
1. Applydatasciencesolutions to real world problems.
2. Implement the programs to get the required data, process it and present the outputsusingPython language.
3. ExecutestatisticalanalyseswithOpensourcePythonsoftware.

VI. **Practical(Laboratory)Syllabus**:*(30hrs.*)

1. WriteaPythonprogramtocreatealinechartforvaluesofyearandGDPasgivenbelow



2. Write a Python program to create a bar chart to display number of students secureddifferentgradingasgiven below



3. Write a Python program to create a time series chart by taking one year month wisestockdata in aCSV file

4. WriteaPythonprogram toplot distributioncurve

5. Import a CSV file and perform various Statistical and Comparison operations onrows/columns. Writeapythonprogramto plotagraphofpeoplewithpulseratepvs.heighth. Thevalues ofPand Hareto be enteredbythe user.

6. Import rainfall data of some location with the help of packages available in R Studioandplot achart ofyour choice.

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III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

Course7C:Python forDataScience
(SkillEnhancementCourse(Elective),Credits:05)

I. **LearningOutcomes:**Studentsaftersuccessfulcompletionofthecoursewillbeableto:

1. Identify the need for data science and solve basic problems using Python built-in datatypesandtheirmethods.
2. Design anapplicationwithuser-definedmodulesandpackagesusingOOPconcept
3. Employefficient storage and dataoperations usingNumPyarrays.
4. Applypowerful datamanipulations usingPandas.
5. Dodatapre-processingandvisualization usingPandas

II. **Syllabus:***(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

Unit-I (10hours)

IntroductiontoDataScience-WhyPython?-EssentialPythonlibraries-PythonIntroduction-Features, Identifiers, Reserved words, Indentation, Comments, Built-in Datatypes and their Methods: Strings, List, Tuples, Dictionary, Set - Type Conversion-Operators.Decision Making- Looping- Loop Control statement- Math and Random number functions.Userdefined functions-functionarguments&its types.

UNIT–II(10 hours)

User defined Modules and Packages in Python- Files: File manipulations, File and Directoryrelatedmethods –PythonException Handling.

OOPsConcepts-ClassandObjects,Constructors–Datahiding-DataAbstraction-Inheritance.

UNIT–III(10 hours)

NumPyBasics:ArraysandVectorizedComputation-TheNumPyn-darray-Creatingn-darrays- Data Types for n-darrays- Arithmetic with NumPy Arrays- Basic Indexing andSlicing-BooleanIndexing-TransposingArraysand SwappingAxes.

UniversalFunctions:FastElement-WiseArrayFunctions-MathematicalandStatisticalMethods-Sorting-Uniqueand Other SetLogic.

UNIT–IV(10 hours)

IntroductiontopandasDataStructures:Series,DataFrameandEssentialFunctionality:Dropping Entries- Indexing, Selection, and Filtering- Function Application and Mapping-Sortingand Ranking.

SummarizingandComputingDescriptiveStatistics-UniqueValues,ValueCounts,andMembership. Readingand WritingData inText Format.

UNIT–V(10hours)

Data Cleaning and Preparation: Handling Missing Data - Data Transformation: RemovingDuplicates, Transforming Data Using a Function or Mapping, Replacing Values, DetectingandFilteringOutliers-StringManipulation: VectorizedStringFunctions inpandas.

Plotting with pandas: Line Plots, Bar Plots, Histograms and Density Plots, Scatter or PointPlots.

III. References

1. Y.DanielLiang,"IntroductiontoProgrammingusingPython",Pearson,2012.
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy,andIPython", O'Reilly,2nd Edition, 2018.
3. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working withData",O'Reilly, 2017.
4. WesleyJ.Chun,"CorePythonProgramming",PrenticeHall,2006.
5. MarkLutz,"LearningPython",O'Reilly,4thEdition,2009.
6. Webresources:
    a. https://www.edx.org/course/python-basics-for-data-science
    b. https://www.edx.org/course/analyzing-data-with-python
    c. https://www.coursera.org/learn/python-plotting?specialization=data-science-python
    d. https://www.programmer-books.com/introducing-data-science-pdf/
    e. https://www.cs.uky.edu/~keen/115/Haltermanpythonbook.pdf

7. Otherwebsourcessuggestedbytheteacher concernedandthecollegelibrarianincludingreadingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:** *(Trainingofstudentsbyteacher infieldrelatedskills:(lab:10+field:05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on collecting the data, analyzing the data and presenting the data usingPythonlanguagewith some real timedata.

2. **For Student**: Students shall (individually) visit any of the agencies like Agriculture dept,statistical cell, irrigation department, Ground water department, CPO office, Rural WaterSupply andSanitationdepartmentetcorsearchonlinetogetrealtimedatalikeAidsdatabase, weather forecasting database, social networking data, etc and identify any onedatabase, implement and present the necessary charts in Python language and submita hand-writtenFieldwork/Projectwork/Projectwork/Projectwork/ProjectworkReportnotexceeding 10pages.Example:Identifyingadatabase,getthedata,presentthedatainrequiredcharts and to predict the futureinstancesif possible.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work Report:05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, and details of place visited, observations, method ofdata collection, database identified, and implementation in Python language, other findingsandacknowledgements*.

5. Unittests(IE).

b) SuggestedCo-CurricularActivities

2. Trainingof students byrelated industrial experts.

3. Assignments

4. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).

5. Presentationbystudents onthe topicswithin andoutsidethesyllabus.

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III B.Sc COMPUTER SCIENCE (SEMESTER-V)

MODEL PAPER BLUE PRINT

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Chapter Name	Short Questions 5 Marks	Essay Questions 10 Marks	Marks allotted to the chapter
UNIT -I	1	2	25
UNIT -II	2	1	20
UNIT -III	1	2	25
UNIT -IV	2	1	20
UNIT -V	1	2	25
Total No. of questions	7	8	
Total Marks Including choice			115

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DEPARTMENT OF COMPUTER SCIENCE

III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

MODEL QUESTION PAPER

Course7C: Python for Data Science
SEMESTER – V

Time: 21/2 Hrs **Max Marks: 60 M**

SECTION – I

Answer any **Four** of the following: 4**X5=20 M**

1. How to slice and transpose arrays
2. Create a python class and object
3. List file and Directory related methods.
4. Explain List and Directory.
5. Explain String manipulations in Python.
6. Discuss Sorting and Ranking in python?
7. Explain control structures in python

SECTION –II

Answer ALL of the following: **4X10=40 M**

1. Explain in detail about Looping control statements in Python.(OR)
   How to create user defined packages in Python.
2. How to handle exceptions in python?(OR)
   How to handle n-d arrays in Python.
3. Discuss various Data cleaning methods.(OR)
   Explain various Mathematical and statistical function in Python.
4. Explain about Selecting, Indexing and Filtering?.(OR)
   Explain various visualization using Panda.

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III B.Sc COMPUTER SCIENCE(W.E.F 2022 – 23)

Course7C:PythonforDataScience –PRACTICALSYLLABUS

V. **Learning Outcomes:**On successful completion of this practical course, student shall beable to:

1. ImplementsimpleprogramsinPython.
2. Implementprogramsrelatedtovariousstructureslikearrays,lists,Data frames,etc.
3. Implementprogramsrelatedtofiles.
4. Implementapplicationsrelatedto datascience.

VI. **Practical(Laboratory)Syllabus**:*(30hrs.*)

1. Perform Creation, indexing, slicing, concatenation and repetition operations onPythonbuilt-in datatypes: Strings,List, Tuples, Dictionary, Set
2. Apply Python built-in data types: Strings, List, Tuples, Dictionary, Set and theirmethodsto solveanygiven problem.
3. Handlenumericaloperationsusingmathandrandomnumber functions
4. Createuser-definedfunctionswithdifferenttypes offunctionarguments.
5. Createpackagesandimportmodulesfrompackages.
6. Perform File manipulations- open, close, read, write, append and copy from onefiletoanother.
7. Writeaprogram forHandleExceptions usingPython Built-in Exceptions
8. Write a program to implement OOP concepts like Data hiding and DataAbstraction.
9. Create NumPy arrays from Python Data Structures, Intrinsic NumPy objects andRandomFunctions.

10. Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining andSplitting.

11. Computation on NumPy arrays using Universal Functions and Mathematicalmethods.

12. Loadanimage fileanddocropandflipoperationusingNumPyIndexing.

13. CreatePandasSeriesandDataFrame fromvariousinputs.

14. Import anyCSVfiletoPandasDataFrameandperformthefollowing:

    (a) Visualizethefirstandlast10records

    (b) Gettheshape,index andcolumndetails

    (c) Select/Deletethe records(rows)/columnsbasedonconditions.

    (d) Performrankingand sortingoperations.

    (e) Dorequiredstatisticaloperationsonthe givencolumns.

    (f) Findthecountanduniquenessofthe given categoricalvalues.

    (g) Renamesingle/multiplecolumns

15. ImportanyCSVfiletoPandas DataFrameandperformthefollowing:

    (a) Handle missingdatabydetectinganddropping/ fillingmissingvalues.

    (b) Transformdatausingapply()and map() method.

    (c) Detectand filteroutliers.

    (d) PerformVectorizedStringoperationsonPandasSeries.

    (e) Visualize data using Line Plots, Bar Plots, Histograms, Density PlotsandScatter Plots.

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UNIT –II	1	2	25
UNIT –III	1	2	25
UNIT –IV	2	1	15
UNIT –V	1	1	15
Total No. of questions	7	8	
Total Marks Including choice			115