

Guru Jambheshwar University of Science & Technology, Hisar

Computer Science

B.A. (Pass Course) 1st Year 1st & 2nd Semester

Scheme Of Examination

(w.e.f.the academic session 2018-19)

Sem-I

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A theory	BACS - 111	Fundamentals Of Computers	3	25	10	--	35	3 hrs
Paper B Theory	BACS - 112	Programming In C	3	25	10	--	35	3 hrs
Paper C Practical	BACS - 113	MS- Office and Programming In C	6	--	--	30	30	3 hrs

Sem-II

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A theory	BACS-121	Data Structure Using C	3	25	10	--	35	3 hrs
Paper B Theory	BACS-122	Computer Organization	3	25	10	--	35	3 hrs
Paper C Practical	BACS-123	Data Structure Using C	6	--	--	30	30	3 hrs

Guru Jambheshwar University of Science & Technology, Hisar

Computer Science

B.A. (Pass Course)2nd Year 3rd&4th Semester

Scheme Of Examination

(w.e.f.the academic session 2019-20)

Sem-III

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A theory	BACS-201	Database Management System	3	25	10	--	35	3 hrs
Paper B Theory	BACS-202	Operating System	3	25	10	--	35	3 hrs
Paper C Practical	BACS-203	Computer Lab-III	6	--	--	30	30	3 hrs

Sem-IV

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A theory	BACS-204	Software Engineering	3	25	10	--	35	3 hrs
Paper B Theory	BACS-205	Computer Network	3	25	10	--	35	3 hrs
Paper C Practical	BACS-205	Computer Lab-IV	6	--	--	30	30	3 hrs

Guru Jambheshwar University of Science & Technology, Hisar

Computer Science

B.A. (Pass Course) 3rd Year 5th& 6th Semester

Scheme Of Examination

(w.e.f.the academic session 2020-21)

Sem-V

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A theory	BACS-311	Object Oriented Programming Using C++	3	25	10	--	35	3 hrs
Paper B Theory	BACS-312	Data Analytics	3	25	10	--	35	3 hrs
Paper C Practical	BACS-313	Computer Lab-V	6	--	--	30	30	3 hrs

Sem-VI

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A theory	BACS-321	Computer Graphics	3	25	10	--	35	3 hrs
Paper B Theory	BACS-322	Python Programming	3	25	10	--	35	3 hrs
Paper C Practical	BACS-323	Computer Lab-VI	6	--	--	30	30	3 hrs

Guru Jambheshwar University of Science & Technology, Hisar

Scheme for Theory + Practical Based Subjects

Guidelines for Scheme of examination of UG Course Computer Science-B.A. Pass course (under semester system)

The Scheme of Examination of undergraduate (UG) Courses (**Theory-70 marks (Two Papers) + Practical-30 marks Based Subjects**) under Faculty of Humanities & Social Sciences run by affiliated degree colleges will be under (50+20) + 30 (External + Internal + Practical) for practical based courses. Pass percentage will be ...

For the UG courses under Faculty of Humanities & Social Sciences, the guidelines regarding scheme and paper setting will be followed as:

For the end semester examinations regarding practical subjects, nine questions are to be set by the examiner. The candidates shall attempt five questions in all. First question will be compulsory of 05 marks based on the entire syllabus. It will comprise of five short answer type questions of one mark each. Students are required to attempt any four questions out of remaining eight questions (these eight questions may be (in) up to four units depending on the subject). All remaining questions shall carry equal marks.

Scheme: [25 Paper-I+25 Paper-II+(10+10)] + 30 [External + (Internal) + Practical]
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1 st question=05 marks (05 short answer type questions of 1 mark each)

Rest four questions: 05 marks each i.e. 4 x 05=20

Total = (25+10+25+10) + 30 = 100 marks
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Components of Internal Assessment (Breakdown of 10 marks in each Paper)	
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(a)	Class Test: 2.5 marks
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(b)	Assignment: 2.5 marks
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(c)	Participation in Class Discussions: 1.5 marks
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(d)	Term Paper/written test/2 nd assignment: 2.5 marks
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(e)	Attendance: 2 marks* (Paper-I+Paper-II+Practicals)
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*Weightage of 2 marks for **Attendance** component out of 20 marks for Internal Assessment shall be available only to those students who attend **75% and more** of classroom lectures and practical. The break-up of marks for **attendance component** for theory + practical papers shall be as under:

(a) 75% and above up to 85%: 01 mark

(b) Above 85%: 02 marks

B.A.-I Computer Science (Pass Course) 1st Semester

BACS – 111: Fundamentals of Computer

Maximum Marks: 35

External Assessment: 25

Internal Assessment: 10

Time: 3 Hours

Note:

1. The question paper will consist of **nine** questions. The candidate shall attempt **five** questions in all. The Question No. 1 will be **compulsory**. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The **Compulsory Question No.1** will be short answer type questions containing **five** questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other questions will carry the 05 marks each.

UNIT I

Computer Fundamentals:

Introduction to Computers: Characteristics and Limitations of Computers, Evolution of Computers, Classification of Computers. Computer Languages. Computer Programs, Structured Programming Concepts

Basic Computer Organization:

Units of a computer, CPU, ALU, Memory Hierarchy, Registers, I/O devices. Mother Board,

UNIT II

Word Processing:

Introduction to MS-Word, Creating & Editing: Formatting Document, Page, Table; Bookmark, Mail Merge, Macros.

Spread Sheets:

Introduction to MS-Excel, Creating & Editing Worksheet, Formatting data, Formulas and Functions, Creating Charts, Pivot Tables.

Power Point Presentations:

Creating, Manipulating & Enhancing Slides, Organizational Charts, Animations & Sounds, Inserting Animated Pictures.

UNIT III

Operating Systems:

Introduction to Operating System: Functions of Operating System, Services; Properties: Batch Processing, Multitasking, Multiprogramming, Interactivity, Distributed environment, Spooling;

Types of Operating System:

Single user and Multiuser, Batch OS, Multiprogramming OS, Multitasking OS, Real-Time OS, Time-Sharing OS, Distributed OS, Network OS.

UNIT IV

Internet Basics:

History of Internet, Web Browsers, Web Servers, Hypertext Transfer Protocol, Internet Protocols Addressing, Internet Connection Types, How Internet Works, ISPs, Search Engines, Emails and Its Working, Internet Security, Uses of Internet, Computer Networks and their advantages, Types of Computer Network, Network Topologies, Basics of Transmission Media. Cloud Computing Basics: Overview, Applications, Intranets and the Cloud. Benefits, Limitations and Security Concerns.

Text/ Reference Books

1. Satish Jain, Kratika, M. Geetha, “MS Office”, BPB Publications, 2010.
2. ITL Education Solutio, “Introduction to Computer Science”, Pearson Education, 2nd Edition 2012.
3. P. K. Sinha, “Computer Fundamentals”, 6th edition, 2003.
4. Tony Feldman, “Introduction to Digital Media”, Routledge; 1 edition, 1996.
5. Bartee, Thomas C, “Digital Computer Fundamentals”, McGraw-Hill Inc., 6th Edition, 1984.

B.A.-I Computer Science (Pass Course) 1st Semester

BACS – 112: Programming in ‘C’

Maximum Marks: 35

External Assessment: 25

Internal Assessment: 10

Time: 3 Hours

Note:

1. The question paper will consist of **nine** questions. The candidate shall attempt **five** questions in all. The Question No. 1 will be **compulsory**. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The **Compulsory Question No.1** will be short answer type questions containing **five** questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other questions will carry the 05 marks each.

UNIT – 1

Introduction to C Programming:

History of C, Character Set, Identifiers and Keywords, Constants, Types of C Constants, Rules for Constructing Integer, Real and character Constants, Variables, Data Types, rules for constructing variables. Input/output: Unformatted & formatted I/O function, Input functions: scanf(), getch(), getche(), getchar(), gets(); output functions: printf(), putch(), putchar(), puts().

Operators and Expressions:

Arithmetic, relational, logical, bitwise, unary, assignment, conditional operators and special operators, Type Conversion in Assignments, Hierarchy of Operations, Structure of a C program.

UNIT – 2

Decision Control Structure:

Decision making Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder.

Loop Control Structure:

While and do-while, for loop and Nested for loop,

Case Control Structure:

Decision using switch; goto, break and continue statements.

Functions:

Library functions and user defined functions, Global and Local variables, Function Declaration, Calling and definition of function, Methods of parameter passing to functions, recursion, Storage Classes in C.

UNIT – 3

Arrays:

Introduction, Array declaration, Accessing values in an array, Initializing values in an array, Single and Two Dimensional Arrays, Initializing a 2-Dimensional Array, Passing array elements to a function: Call by value and call by reference, Arrays of characters, Insertion and deletion operations, Searching the elements in an array, Using matrices in arrays, Passing an Entire Array to a Function.

Pointers:

Pointer declaration, Address operator “&”, Indirection operator “*”, Pointer and arrays, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers.

Dynamic Memory Allocation:

malloc(), calloc(), realloc(), free() functions.

UNIT – 4

String Manipulation in C:

Declaring and Initializing string variables, Reading and writing strings, String Handling functions (strlen(), strcpy(), strcmp(), strcat(), strrev()).

Structures and Unions:

Declaration of structures, Structure Initialization, Accessing structure members, Arrays of structure, Nested structures, Structure with pointers, Union.

Files in C:

Introduction, Opening and Closing files, Basic I/O operation on files.

Text/ Reference Books:

1. Yashvant Kanetkar, “Let Us C”, 15th Edition, BPB Publications, 2016.
2. Salaria, R.S. : Test Your Skills in C, Salaria Publications, New Delhi.
3. E. Balaguruswami : Programming with C Language, Tata McGraw Hill, New Delhi.
4. Byron S. Gottfried : Programming in C, McGraw Hills Publishers, New York.
5. M.T. Somashekara : Programming in C, Prentice Hall of India.

B.A.-I Computer Science (Pass Course) 1st Semester
BACS – 113: Computer Lab-I (4 Hours per week)
Based on Fundamentals of Computer and Programming in ‘C’

Maximum Marks: 30

Time: 3 Hours

List of Experiments:

Section- A (Fundamentals of Computer)

1. Create an admission form in MS-Word. You need to use Text-Boxes, Shapes, Colors, formatting options, table and horizontal lines.
2. Send a birthday invitation to your 100 friends using Mail-Merge.
3. Study and use various functions like Sum, Average, Maximum, and Minimum in MS-Excel.
4. Fill 50 students' records in MS-Excel sheet1. The fields must be Roll No., Name, Father Name, Course Joined, Marks obtained in three subjects. Create a marks-sheet in sheet2.
5. Create 10 slides in MS-PowerPoint related to internet advantages and disadvantages in daily life. Add animations to these all slides.

Section-B (Programming in ‘C’)

1. Program to convert a given decimal number into its binary equivalent using bitwise operators.
2. Program to accept a positive integer and find the sum of the digits in it.
3. Find The Roots of Quadratic Equation using if else statement.
4. Program to generate prime numbers.
5. Program to multiply two matrices.
6. Program to find GCD and LCM using non-recursive function.
7. Program to generate terms of Fibonacci series using recursive function.
8. Program to read a string and check whether it is a palindrome or not (using library functions).
9. Program to create a file called emp.txt and store information about a person, in terms of his name, age and salary.
10. Program to add two complex numbers using structure to store a complex number.

Note: In addition to the above experiments, the teacher may add more programs on the behalf of the theory syllabus.

B.A.-I Computer Science (Pass Course) IInd Semester
BACS – 121: Data Structure using ‘C’

Maximum Marks: 35

External Assessment: 25

Internal Assessment: 10

Time: 3 Hours

Note:

1. The question paper will consist of **nine** questions. The candidate shall attempt **five** questions in all. The Question No. 1 will be **compulsory**. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The **Compulsory Question No.1** will be short answer type questions containing **five** questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other questions will carry the 05 marks each.

UNIT – 1

Data Structure Basics:

Introduction to Complexity, Introduction to Data Structures, Classification of data structure, Abstract data type; Data Structure Operations, Applications of Data Structure.

Arrays:

Definition of array, Single and Multi-dimensional Arrays, Representation of single and 2-dimensional arrays and their address calculation, basic operations on single dimensional arrays, Algorithm for insertion and deletion operations; Sparse Matrices and its representation.

Stacks:

Definition of stack, Operations on stack, Algorithms for push and pop operations using array. Stack Applications: Prefix, Infix and Postfix expressions, Conversion of Infix expressions to Postfix expression using stack; Recursion.

UNIT – 2

Queues:

Introduction to Queue. Operations on Queues, Circular queue, Algorithm for insertion and deletion in simple queue and circular queue using array. De-queue, Priority Queues.

Linked Lists:

Introduction, Array vs Linked list; Singly, Doubly and Circular linked Lists and representation of linked lists in memory. Implementation of Stack and simple Queue as single Linked List.

UNIT -3

Trees:

Introduction to Tree as a data structure, Basic Terminology; Binary Trees, Traversal of binary trees: In-order, Pre-order & post-order. Binary tree non recursive traversal algorithms. Binary Search Tree, (Creation, and Traversals of Binary Search Trees)

Graphs:

Introduction, Memory Representation, Graph Traversal (DFS and BFS)

UNIT - 4**Searching:**

Binary and Linear Search

Sorting:

Bubble sort, Insertion sort, Selection sort, Merge Sort, Quick sort. Comparison of various Searching and Sorting algorithms.

Text/ Reference Books:

1. Ellis Horowitz & Sartaj Sahni, "Fundamentals of Data structures in C", 2nd Edition, Silicon Press, 2007.
2. R. B. Patel, "Expert Data Structures with C", 3rd Edition, Khanna Book Publishing, 2014.
3. A. M. Tenenbaum, Langsam, "Data Structures using 'C'," Pearson Education, 2009.
4. Lipschultz L. Seymour, 2001 : Data Structure, Schaum Outline Series, TMH, New Delhi.
5. Salaria, R. S. : Data Structures & Algorithm Using C, Khanna Book Publishing Co. (P.) Ltd., New Delhi.
6. Salaria, R. S., Test Your Skills in Data Structures, Khanna Book Publishing Co. (P.) Ltd., New Delhi.
7. Sofat Sanjeev, Data Structure with C and C++, Khanna Book Publishing Co. Patel, R.B., Expert Data Structure in C, Khanna Book Publishing Co.

B.A.-I Computer Science (Pass Course) IInd Semester
BACS – 122: Computer Organization

Maximum Marks: 35

External Assessment: 25

Internal Assessment: 10

Time: 3 Hours

Note:

1. The question paper will consist of **nine** questions. The candidate shall attempt **five** questions in all. The Question No. 1 will be **compulsory**. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The **Compulsory Question No.1** will be short answer type questions containing **five** questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other questions will carry the 05 marks each.

UNIT – 1

Data Representation:

Number Systems: Decimal, Binary, Octal, Hexadecimal, Conversion from one number system to other; Binary arithmetic operations, Representation of Negative Numbers: 1's complement and 2's complement; fixed and floating point representation, character representation (BCD, EBCDIC and ASCII Code), BCD number system; Weighted Codes, Self Complementing Code, Excess-3 code, Gray and Cyclic code.

UNIT – 2

Boolean Algebra:

Introduction, Definition, Postulates of Boolean Algebra, Fundamental Theorems of Boolean Algebra; Duality Principle, Demorgan's Theorems, Boolean Expressions and Truth Tables, Standard SOP and POS forms, Canonical representation of Boolean expressions, Simplification of Boolean Expressions using theorems of Boolean algebra, Minimization Techniques for Boolean Expressions using Karnaugh Map.

Logic Gates:

AND, OR, NOT, NOR, NAND & XOR Gates and their Truth tables.

UNIT – 3

Combinational Circuits:

Half Adder & Full Adder, Half Subtractor & Full Subtractor, Adder & Subtractor, decoders, multiplexors. Realization of Boolean expressions using decoders and multiplexor.

Sequential Circuits:

Flip-Flops, Types- RS, T, D, JK and Master-Slave JK flip flop, Triggering of Flip Flops; Flip Flop conversions, Shift Registers, Synchronous and Asynchronous Counters.

UNIT – 4

Basic Computer Organization and Design:

Register Organization, Bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt.

Programming the Basic Computer:

Instruction formats, addressing modes, instruction codes.

Input-output Organization:

Peripheral devices, I/O interface, Modes of data transfer, Direct Memory Access.

Text/ Reference Books:

1. William H.Gothman, “Digital Electronics-An Introduction to Theory and Practice” 2nd Edition, Prentice Hall of India Pvt. Ltd., 2009.
2. Mano, M. Morris,“Digital Logic and Computer Design”, Prentice Hall of India Pvt.Ltd., 2000.
3. W.Stallings,“Computer Organization & Architecture”, Pearson Education, 7th Edition, New Delhi, 2006.
4. N. Carter,“Computer Architecture”, Schaums Outline Series, Tata McGraw Hill, New Delhi, 2006.

B.A.-I Computer Science (Pass Course) IInd Semester
BACS – 123: Computer Lab-II (4 Hours per week)
Based on Data Structure using 'C'

Maximum Marks: 30

Time: 3 Hours

List of Experiments:

1. Program to convert a given infix expression to postfix.
2. Program to insert/delete an element in/from an array at a given location.
3. Program to implement Stack using structure
4. Program to implement Single Queue using structure
5. Program to insert, delete and display the linked list (Beginning, End and given position)
6. Program to generate BST and traverse recursively (infix).
7. Program to generate BST and traverse recursively (prefix).
8. Program to generate BST and traverse recursively (postfix).
9. Program for Binary Search.
10. Program for sorting an array using any sorting technique

Note: In addition to the above experiments, the teacher may add more programs on the behalf of the theory syllabus.

Guru Jambheshwar University of Science & Technology, Hisar

Scheme for Theory+Practical Based Subjects

Guidelines for Scheme of examination of UG Course

Computer Science-B.A.Pass course (under semester system)

The Scheme of Examination of undergraduate(UG) Courses (**Theory-70marks (Two Papers)+Practical-30marksBasedSubjects**) under Faculty of Humanities & Social Sciences run by affiliated degree colleges will be under (50+20)+30 (External+Internal+Practical) for practical based courses. Pass percentage will be...

For the UG courses under Faculty of Humanities & Social Sciences, the guidelines regarding scheme and paper setting will be followed as:

For the end semester examinations regarding practical subjects, nine questions are to be set by the examiner. The candidates shall attempt five questions in all. First question will be compulsory of 05 marks based on the entire syllabus. It will comprise of five short answer type questions of one mark each. Students are required to attempt any four questions out of remaining eight questions (these eight questions may be (in) up to four units depending on the subject). All remaining questions shall carry equal marks.

Scheme: [25 Paper-I+25 Paper-II+(10+10)]+30[External+(Internal)+Practical]

1st question=05marks (05 short answer type questions of 1 mark each)

Rest four questions : 05 marks each i.e. 4x05=20

Total=(25+10+25+10)+30=100 marks

Components of Internal Assessment(Breakdown of 10 marks in each Paper)

- | | |
|-----|---|
| (a) | Class Test: 2.5 marks |
| (b) | Assignment: 2.5 marks |
| (c) | Participation in Class Discussions: 1.5 marks |
| (d) | Term Paper/ written test/ 2 nd assignment: 2.5 marks |
| (e) | Attendance: 2 marks* (Paper-I+Paper-II+Practicals) |

*Weightage of 2 marks for **Attendance** component out of 20 marks for Internal Assessment shall be available only to those students who attend **75% and more** of class room lectures and practical. The break-up of marks for **attendance component** for theory+practical papers shall be as under:

- (a) 75% and above upto 85% : 01 mark
- (b) Above 85% : 02 marks

Guru Jambheshwar University of Science & Technology, Hisar

Computer Science

B.A. (Pass Course) IInd Year 3rd & 4th Semester

Scheme of Examination

(w.e.f. the academic session 2019-20)

3rd Semester

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A Theory	BACS 201	Data Base Management System	3	25	10	--	35	3 hrs
Paper B Theory	BACS 202	Operating System	3	25	10	--	35	3 hrs
Paper C Practical	BACS (P) 203	Computer Lab-III	6	--	--	30	30	3 hrs

4th Semester

Paper No.	Paper Code	Nomenclature of Paper	Periods per Week	External Marks	Internal Marks	Practical	Total Marks	Time
Paper A Theory	BACS 204	Software Engineering	3	25	10	--	35	3 hrs
Paper B Theory	BACS 205	Computer Networks	3	25	10	--	35	3 hrs
Paper C Practical	BACS (P) 206	Computer Lab-IV	6	--	--	30	30	3 hrs

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Computer Science

B.A. (Pass Course) IInd Year 3rd Semester

PAPER-A (THEORY) BACS 201 : DATA BASE MANAGEMENT SYSTEM

(w.e.f. the academic session 2019-20)

Maximum Marks: 35

External Marks :25

Internal Marks: 10

Time: 3 hours

Note:

1. The question paper will consist of *nine* questions. The candidate shall attempt *five* questions in all. The Question No. 1 will be compulsory. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The Compulsory Question No.1 of 05 marks will be short answer type questions containing five questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other question will carry the 05 marks each.

UNIT - I

Basic Concepts: A Historical perspective, File Systems vs. DBMS, Characteristics of the Data Base Approach, Abstraction and Data Integration, Database users, Advantages and Disadvantages of DBMS, DBMS architecture, Data Models, Schemas and Instances, Data Independence.

UNIT-II

Entity Relationship (ER) Model: Basic Concepts-Entity, Attributes, Types of Attributes, Entity set and Keys; Relationships-Relationship set, Degree of Relationship, Mapping Cardinalities. ER diagram representation-Representation of Entity, Attributes and Relationship. Binary Representation and Cardinality, Participation Constraints.

UNIT – III

Relational Model : Relational model concepts (Tables, Tuple, Relation instance, Relation schema, Relation key, Attribute domain), Constraints- Key constraints, Domain constraints, Referential integrity constraints; Relational algebra, Basic operations: Select, Project, Union, Set difference, Cartesian product, Rename.

UNIT - IV

Relational Database design: Mapping ER model to relational database, functional dependencies, Lossless decomposition, Desirable properties of decomposition, Normal forms (1 NF, 2 NF, 3 NF and BCNF).

SQL: Why SQL, Data Types; DDL-Create, Alter and Drop table Commands. DML-SELECT/ FROM/ WHERE, INSERT INTO/ VALUES, UPDATE /SET/ WHERE, DELETE Commands. UNION [ALL], INTERSECTION and MINUS Operators.

Suggested Readings:

1. Elmasri & Navathe: Fundamentals of Database systems, 3rd Edition, Addison Wesley, New Delhi.
2. Ivan Bayross : SQL, PL/SQL-The Program Language of ORACLE, BPB Publication, New Delhi.
3. Korth & Silberschatz : Database System Concept, 4th Edition, McGraw Hill International Edition.
4. C.J.Date : An Introduction to Data bases Systems 7th Edition, Addison Wesley, New Delhi.

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Computer Science

B.A. (Pass Course) IInd Year 3rd Semester

PAPER-B (THEORY) BACS 202 : OPERATING SYSTEM

(w.e.f. the academic session 2019-20)

Maximum Marks: 35

External Marks :25

Internal Marks: 10

Time: 3 hours

Note:

1. The question paper will consist of *nine* questions. The candidate shall attempt *five* questions in all. The Question No. 1 will be compulsory. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The Compulsory Question No.1 of 05 marks will be short answer type questions containing five questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other question will carry the 05 marks each.

UNIT - I

Structure of Operating Systems: Layers-MS-DOS Layer Structure, Traditional UNIX System Structure; Running Multiple Operating Systems, Running a Virtual Operating System, Operating System Modes, System Boot.

Process Management: Introduction to Process, Attributes of a process, Process States, Operations on the Process, Process Schedulers, CPU Scheduling, Scheduling Algorithms, Purpose of a Scheduling algorithms, Introduction to FCFS, Shortest Job First (SJF), Shortest Job First (SJF), Round Robin Scheduling Algorithms.

UNIT - II

Memory Management: Fixed and Dynamic partition, Physical and Logical Address Space, Page Table, Mapping from page table to main memory, Page Table Entry, Size of the page table, Finding Optimal Page Size. Virtual Memory Concepts, Advantages and disadvantage of Virtual Memory. Segmentation, Translation of Logical address into physical address by segment table, Advantages and disadvantage of Segmentation. Paging VS Segmentation.

UNIT - III

File Management: Attributes of File, Operations on File; File Access Methods-Sequential, Direct and Indexed Access; Directory Structure, File Systems, File System Structure- different layers; Master Boot Record, Directory Implementation-Linear List and Hash Table; Disk space Allocation Methods-Contiguous Allocation and FAT.

UNIT - IV

Shell introduction and Shell Scripting: What is shell and various type of shell, Various editors present in Linux/Unix; Different modes of operation in vi editor; Shell script, Writing and executing the shell script, Shell variable (user defined and system variables); System calls, Pipes and Filters, Decision making in Shell Scripts (If else, switch), Loops in shell, Utility programs (cut, paste, join, tr , uniq utilities), Pattern matching utility (grep)

Suggested Readings:

1. A. Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 9 Edition, John Wiley Publications 2015 India Edition.
2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
3. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education, 1997.
4. W. Stallings, Operating Systems, Internals & Design Principles , 5th Edition, Prentice.Hall of India. 2008.
5. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

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Computer Science

B.A. (Pass Course) IInd Year 3rd Semester

PAPER-C (PRACTICAL) BACS(P) 203 :COMPUTER LAB-III

(w.e.f. the academic session 2019-20)

Maximum Marks: 30

Time: 3 hours

A. List of Experiments Using SQL:

1. Create a database and write the commands to carry out the following operation :
 - a. Alter table
 - b. Describe table
 - c. Drop table
2. Create a database and write the programs to carry out the following operation :
 - a. Add a record in the database
 - b. Delete a record in the database
 - c. Modify the record in the database
 - d. Generate queries
 - e. Generate the report
 - f. List all the records of database in ascending order
3. Create a database and write the programs to carry out the following constraints:
 - a. Key constraints
 - b. Domain constraints
 - c. Referential integrity constraints
4. Create a database and write the commands to carry out the following set operation on the database:
 - a. Union
 - b. Intersect
 - c. Minus

B. List of Experiments Operating System Lab:

1. Study of Unix/Linux vi editor.
2. Shell Script To Display Logged in Users, Your UserName and Date / Time.
3. Shell script program to check whether given file is a directory or not.
4. Study of Unix/Linux Utility Programs (cut, paste, join, tr , uniq utilities, grep).
5. Program in C to report behaviour of Linux kernel including kernel version, CPU type and model.
(CPU information)
6. Program in C to Copy a file using UNIX-system calls.
7. Program in C to implement FCFS Scheduling.

Guru Jambheshwar University of Science & Technology, Hisar

Computer Science

B.A. (Pass Course) IInd Year 4th Semester

PAPER-A (THEORY) BACS 204 : SOFTWARE ENGINEERING

(w.e.f. the academic session 2019-20)

Maximum Marks: 35

External Marks :25

Internal Marks: 10

Time: 3 hours

Note:

1. The question paper will consist of *nine* questions. The candidate shall attempt *five* questions in all. The Question No. 1 will be compulsory. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The Compulsory Question No.1 of 05 marks will be short answer type questions containing five questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other question will carry the 05 marks each.

UNIT – I

Introduction: Program vs. Software, Software Engineering paradigms, Software Crisis – problem and causes.

Phases in Software development: Requirement, Analysis, Software Design, Coding, Testing, Maintenance.

Software Development Process Models: Waterfall, Prototype, Evolutionary and Spiral models.

UNIT – II

Software Requirement Analysis and Specifications: Feasibility Study Software Requirements, Need for SRS, Characteristics of an SRS, Components of an SRS, Structure of a requirements document, validation and metrics. Problem Analysis, Data Flow Diagram, Data Dictionary, Decision table, Decision trees

UNIT – III

Software Project Planning: Process Planning, Effort estimation, COCOMO model, Project scheduling and Staffing, team structure, Software configuration management, Quality assurance plans, Risk Management, Project monitoring plans.

Software Implementation and Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics.

Unit IV

Testing : Testing fundamentals, Error, Fault, and Failure, Test Oracle, Test Case and Test Criteria, Psychology of testing, Black Box Testing, Equivalence Class Partitioning, Boundary value analysis, Cause effect graphing, White box testing , Control flow based criteria, level of testing, Unit testing, Integration testing, System testing, Validation testing, alpha, beta, and Acceptance testing.

Suggested Readings:

1. Pressman R. S., “Software Engineering – A Practitioner’s Approach”, Tata McGraw Hill.
2. Jalote P., “An Integrated approach to Software Engineering”, Narosa.
3. Sommerville, “Software Engineering”, Pearson Education.
4. Fairley R., “Software Engineering Concepts”, Tata McGraw Hill.

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Computer Science

B.A. (Pass Course) IInd Year 4th Semester

PAPER-B (THEORY) BACS 205 :COMPUTER NETWORKS

(w.e.f. the academic session 2019-20)

Maximum Marks: 35

External Marks :25

Internal Marks: 10

Time: 3 hours

Note:

1. The question paper will consist of *nine* questions. The candidate shall attempt *five* questions in all. The Question No. 1 will be compulsory. The Candidate shall attempt four more questions selecting at least one from each Unit. The paper will carry 35 marks out of which 10 marks will be earmarked for internal assessment.
2. The Compulsory Question No.1 of 05 marks will be short answer type questions containing five questions of equal marks (i.e., 1 mark each) spread over the whole syllabus. Other question will carry the 05 marks each.

UNIT – I

Introduction to Computer Communications and Networking Technologies, Uses of Computer Networks, Network Devices, Nodes, and Hosts, Types of Computer Networks and their Topologies, OSI Reference Model, TCP/IP Reference Model.

UNIT – II

Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing.

UNIT - III

Data Link Layer: Framing, Flow Control, Error Control, Error Detection and Correction, Sliding Window Protocols, Media Access Control, Random Access Protocols, Token Passing Protocols, Token Ring, Ethernet, gigabit Ethernet, token ring, FDDI, Bluetooth and Wi-Fi.

UNIT – IV

Network Layer and Routing Concepts: Virtual Circuits and Datagrams, Routing Algorithms, Flooding, Shortest Path Routing, Distance Vector Routing, Link State Routing, Hierarchical Routing, Congestion Control Algorithms, Internetworking, IPV4 and IPV6.

Suggested Readings:

1. Michael A. Gallo, William M. Hancock, “Computer Communications and Networking Technologies”, CENGAGE Learning.
2. Andrew S. Tanenbaum, “Computer Networks”, Pearson Education.
3. James F. Kurose, Keith W. Ross, “Computer Networking”, Pearson Education.
4. Behrouz A Forouzan, “Data Communications and Networking”, McGraw Hill.

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Computer Science

B.A. (Pass Course) IInd Year 4th Semester

PAPER-C (PRACTICAL) BACS(P) 206 :COMPUTER LAB-IV

(w.e.f. the academic session 2019-20)

Maximum Marks: 30

Time: 3 hours

List of Experiments:

1. Study of different types of Network cables and Practically implement the cross-wired cable and straight through cable using clamping tool.
 - Components: RJ-45 connector, Clipping Tool, Twisted pair Cable
2. Study of Network Devices in Detail.
 - Repeater, Hub, Switch, Bridge, Router, Gate Way
3. Study of network IP.
 - Classification of IP address, Sub netting, Super netting
4. Connect the computers in Local Area Network.
 - Procedure on the host computer
 - Procedure on the client computer
5. Study of basic network command and Network configuration commands.
 - Software: Command Prompt And Packet Tracer.
 - Configuring the Router commands
 - General Commands to configure network
 - Privileged Mode commands of a router
 - Router Processes & Statistics
 - IP Commands
 - Other IP Commands e.g. show ip route etc.
6. Configure a Network topology using packet tracer software.
 - Software: Packet tracer Software
7. Configure a Network using Distance Vector Routing protocol.
 - Software: packet tracer software
8. Configure Network using Link State Vector Routing protocol.
 - Software: packet tracer software

B.A.– COMPUTER SCIENCE

SEMESTER V and VI

W.e.f. Batch 2018 onwards

BACS- 311
Object Oriented Programming Using ‘C++’

Max. Marks:35

External

Marks:25Time:3Hours

InternalMarks:10

Papersetterisrequiredtosetninequestionsinall.Questionno.1iscompulsoryandisbasedontheentiresyllabusconsistingoffiveshortanswertypequestionseachof1marks. The remainingeightquestionsare tobe setuniformly havingtwoquestionsfromeachunit.ThestudentisrequiredtoattemptfivequestionsinallselectingonequestionfromeachunitandQuestion No.1 iscompulsory.

UNIT – I

Procedure Oriented Programming, Object-Oriented programming Paradigm, difference between Procedure Oriented Programming and Object-Oriented programming, Basic concepts of Object-Oriented programming, Benefits of OOP, Object Oriented Languages, and application of OOP. Structure of a C++ Program, Insertion operator, Extraction operator, Hierarchy of Console Stream Classes, Unformatted and Formatted I/O Operations, Manipulators, inline functions.

UNIT-II

C structure revisited, specifying a Class, Creating Objects, Defining member function, Memory allocation for objects, Scope resolution operator and its significance, Static Data Members, Static member functions, Friend Function, Friend Class.

UNIT – III

Dynamic Memory Management using new and delete Operator , Constructor, type of constructors, Dynamic initialization of objects, Constructor overloading, Constructor with default arguments, Destructors, function overloading, Operator Overloading, Overloading unary and binary operators.

UNIT – IV

Inheritance, Single Inheritance, Making a private member inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Class. Abstract Classes, Constructors in derived classes.

Suggested Readings:

1. Balaguruswami, E., Object Oriented Programming with C++, Tata McGraw-Hill.
2. Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
3. Bjarne Stroustrup, The C++ Programming Language, Pearson Education
4. Herbert Schildt, C++, The Complete Reference, Tata McGraw-Hill

BACS-312
DATA ANALYTICS

Max. Marks:35

External

Marks:25Time:3Hours

InternalMarks:10

Papersetterisrequiredtosetninequestionsinall.Questionno.1iscompulsoryandisbasedontheentiresyllabusconsistingoffiveshortanswertypequestionseachof1marks. The remainingeightquestionsare tobe setuniformly havingtwoquestionsfromeachunit.ThestudentisrequiredtoattemptfivequestionsinallselectingonequestionfromeachunitandQuestion No.1 iscompulsory.

UNIT-I

Data Analytics:Introduction to Data Analytics, Business Intelligence (BI) for better decisions, Decision types, BI tools, BI skills, BI applications.

Data warehousing: Introduction to Data warehousing (DW), Design considerations for DW, DW development approaches, DW architecture.

Data Mining:Introduction to Data mining, Data cleaning and preparation, outputs of Data mining, evaluation of data mining results, Data Mining Techniques.

UNIT-II

Decision Trees:Introduction to Decision tree, Decision tree problem, Decision tree construction, Lessons from constructing trees, Decision tree algorithms.

Regression: Introduction, Correlations and Relationships, Visual Look at Relationships, Logistic regression, Advantages and disadvantages of regression models.

Artificial Neural Networks: Introduction, business applications of ANN, Design principles of an ANN, Representation of a neural network, Architecting a neural network, Developing an ANN, Advantages and disadvantages of using ANN.

UNIT-III

Cluster analysis: Introduction, Applications of cluster analysis, Definition of a cluster, Representing clusters, Clustering techniques, K-means algorithm for clustering, Selecting the number of clusters.

Association rule Mining: Introduction, Business applications of association rules, Representing association rules, Algorithms for association rule, Apriori algorithm, Creating association rules.

Web Mining: Introduction, Web content mining, Web structure mining, Web usage mining, Web mining algorithms.

UNIT-IV

Naïve-base analysis:Introduction, Probability, Naïve base model, Text classification example.

Support vector machines: Introduction, SVM model, The kernel method,

Big data: Introduction, Defining big data, Big data landscape, Business implications of big data, Technology implications of big data, Big data technologies, Management of big data.

Suggested Readings

1. Data Analytics by Anil Maheshwari, Mc GrawHill Education, 2017.
2. Data Analytics for Beginners, Robert J. Woz, Createspace Independent Pub (October 2017)

Note: Latest and additional good books may be suggested and added from time to time.

BACS-313
Computer Lab—V

Marks: 30
Time: 3 Hours

List of Experiments Using C++:

1. Write a program to perform different arithmetic operation such as addition, subtraction, division, modulus and multiplication using inline function.
2. Write a program to find area of square, rectangle, circle using function overloading.
3. Define a class to represent an item class with data members as number and cost. Write member functions to read and display the data. Write a main program to test the data.
4. Define a class to represent a bank account with the following members
Data members:
 1. Account holder Name
 2. Account number
 3. Type of account
 4. Balance amount in the accountMember functions:
 1. to assign initial value
 2. To deposit an amount
 3. To withdraw an amount after checking the balance
 4. To display name and balanceWrite a main program to test it.
5. Write a program to explain the concept of static data member.
6. Write a program to explain the concept of static member function.
7. Write a program to swap private data of two different classes using friend function.
8. Define a class for complex number with default, parameterized, copy constructor. Write a program to add two complex numbers using friend function.
9. Define a class string with dynamic constructors. Write a program to concatenate two strings.
10. Write a program to show the order in which objects are created and destroyed using constructor and destructor.
11. Write a program to overload unary minus (-) operator using space class.
12. Write a program to overload binary plus (+) operator as member function to add two complex numbers.
13. Write a program to overload binary plus (+) operator as friend function to add two complex numbers.
14. Write programs to explain single, multiple, multilevel, hierarchical and hybrid inheritance.

15. Write a program to explain manipulators.

BACS-321
COMPUTER GRAPHICS

Max. Marks:35

External

Marks:25 Time:3Hours

Internal Marks:10

Papersetter is required to set nine questions in all. Question no. 1 is compulsory and is based on the entire syllabus consisting of five short answer type questions each of 1 marks. The remaining eight questions are to be set uniformly having two questions from each unit. The student is required to attempt five questions in all selecting one question from each unit and Question No. 1 is compulsory.

UNIT - I

Introduction: Historical perspective of Computer Graphics, Basic elements of Computer graphics (Modelling, Rendering, Animation), Applications of Computer Graphics.

Input Devices: Keyboard, Mouse, Light Pen, Graphic Tablets, Joysticks, Trackball, Flatbed Scanner.

UNIT - II

Hard Copy Devices: Laser Printer, Flatbed Plotters.

Video Display Devices: Pixel, Resolution, Aspect Ratio, Refresh Rate and Interlacing. Cathode Ray Tube, Flat Panel Display-LCD and Plasma Panel. Raster and Random scan display system.

UNIT - III

Fundamental Techniques in Graphics: Line Generation Algorithms-DDA Algorithm, Bresenham's Line Generation Algorithm. Circle Generation Algorithms-Bresenham's Algorithm and Midpoint Circle Algorithm. Polygon Filling Algorithms-Scan Line Algorithm. Viewing & Clipping-Point Clipping and Line Clipping, Cohen-Sutherland Line Clipping Algorithm. Polygon Clipping (Sutherland Hodgman Algorithm)

UNIT – IV

2-Dimensional Graphics: Cartesian and Homogeneous Co-ordinate System, Geometric Transformations (Translation, Scaling, Rotation, Reflection).

3-Dimensional Graphics: Geometric Transformations (Translation, Scaling, Rotation, Reflection), Mathematics of Projections (Parallel & Perspective).

Suggested Readings:

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam,Stevan.
2. K.Feiner and Johb F. Hughes, 2000, Addision Wesley.
3. Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI.
4. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
5. Introduction to Computer Graphics By N. KrishanmurthyT.M.H 2002

BACS-322
PYTHON PROGRAMMING

Max. Marks:35
Marks:25Time:3Hours
InternalMarks:10

External

Papersetterisrequiredtosetninequestionsinall.Questionno.1iscompulsoryandisbasedontheentiresyllabusconsistingoffiveshortanswertypequestionseachof1marks. The remainingeightquestionsare tobe setuniformly havingtwoquestionsfromeachunit.ThestudentisrequiredtoattemptfivequestionsinallselectingonequestionfromeachunitandQuestion No.1 iscompulsory.

UNIT - I

Introduction to Python:History and Features of Python Programming, Python Interpreter. Variable, identifiersand literal. Token, keywords. Data Types. Arithmetic operators, Relational operators, Logicaloperators, Bitwise operators, Assignment operators, Membership operators, Identity operators. Operator precedence. Comment, Indentation, Need for indentation

Built-in Functions: input, eval, composition, print, type, round, min and max, pow. Type Conversion, Random Number Generation. Mathematical Functions. Getting help on a function, Assert Statement.

UNIT - II

Control Statements: if Conditional Statement, for and while Statements. break, continue and pass statements.

Functions:Function Definitionand Call, Function Arguments-Variable Function Arguments, Default Arguments, Keyword Arguments,Arbitrary Arguments. Command Line Arguments. Global and local Variables. Accessing local variable outside the scope,Using Global and Local variables in same code, Using Global variable and Local variable with sameName.

UNIT - III

Strings:String as a compound data type. String operations- Concatenation, Repetition, Membership operation, Slicing operation. String methods-count, find, rfind, capitalize, title, lower, upper, swapcase, islower, isupperistitle, replace, isalpha, isdigit, isalnum. String Processing examples.

Lists:List operations-multiplication, concatenation, length,indexing,slicing, min, max, sum, membership operator; List functions-append, extend, remove, pop, count, index, insert, sort, reverse.

Recursion: Recursive solutions for problems on Numbers, String and list.

UNIT - IV

Object Oriented Programming: Introduction to Classes, Method, Class object, Instance object, Method object. Class as abstract data type, Data Class. Access attributes using functions-getattr, setattr, delattr. Built-In Class Attributes of Class object(__dict__, __doc__, __name__, module__).

Graphics:Screen Objects- Point and line, box, polygon, circle, arc. Screen Object Methods-move_to(),move_by(),rotate_by(),Text().Sound-Sound(),play_sound(),stop_sound().

Suggested Readings:

1. SheetalTaneja and Naveen Kumar, “Python Programming A modular Approach”, Pearson
2. P. K. Sinha &PritiSinha , “Computer Fundamentals”, BPB Publications, 2007.
3. Dr. Anita Goel, “Computer Fundamentals”, Pearson Education, 2010.
4. Allen Downey, Jeffrey Elkner, Chris Meyers.How to think like a computer scientist learning with Python / 1st Edition,2012 .

BACS-323
Computer Lab--VI

Marks: 30
Time: 3 Hours

List of Experiments Using PYTHON:

1. Write a Program to convert decimal number into binary, octal and hexadecimal number system using built-in functions.
2. Write a program to find the H.C.F of two input number using function.
3. Write a program to slice lists.
4. Write a program to change or add elements to a list.
5. Write a program to display calendar of given month of the year.
6. Write a program to compute factorial of a number using recursion.
7. Write a program to reverse the string using recursion.
8. Write a program to create copy of list using recursion.
9. Write a program to implement Bresenham's line drawing algorithm.
10. Write a program to implement mid-point circle drawing algorithm.
11. Write a program to clip a line using Cohen and Sutherland line clipping algorithm.
12. Write a program to clip a polygon using Sutherland Hodgeman algorithm.
13. Write a program to apply various 2D transformations.