UNIVERSITY OF KOTA, KOTA B.Sc. INFORMATION TECHNOLOGY EXAM. – 2020-21

Eligibility: 10+2 Science or Mathematics with 40% marks **Selection**: Based on Merit in qualifying examination.

1. Scheme of Instruction:

Each year shall be of ten months (150 working days) duration. Details of lecture hours per week shall be as follows: **Theory:** Three hours/week for each Paper

Practical: Students are required to work in the Laboratory for 4 hours per week for each practical under faculty guidance.

2. Examination Scheme:

- 1. University shall conduct examinations only after completion of 150 working days of instruction in a year.
- 2. Each theory paper shall be of 100 marks (75 marks for written examination of 3 hrs duration and 25 marks for internal assessment).
- 3. Each practical paper shall be of 100 marks.
- 4. The internal marks will be awarded by committee consisting of Head of the Department & the faculty concerned.
- 5. The student have to pass internal and external exam separately theory as well as practical papers.

Theory:

- 1. Assignments: 40% of the internal assessment marks for each theory paper will be awarded on the basis of performance in the assignments regularly given to the students, and its records.
- 2. **Internal Examination:** 40% of the total Internal Assessment marks for each theory paper will be awarded on the basis of performance in written examination conducted by the faculty, one at the end of fourth month and another at the end of eighth month.
- 3. **Seminar/Oral examination:** 10% of the total internal assessment marks for each paper will be awarded on the basis of performance either in a seminar or internal viva-voce.

4. **Overall performance:** 10% of the total internal assessment marks will be awarded for each paper on the basis of performance and conduct in the classroom.

Practical :

- 1. **Project**: 80% of the total Internal Assessment Marks for each practical paper during I & II year will be awarded on the basis of project, its presentation and project report submitted by the students. This activity can be held in the team of maximum two students. There should be a project co-ordinator (faculty member of computer science department).
- 2. Internal examination: 10 % of the total Internal Assessment marks for each practical paper during I & II year will be awarded on the basis of performance in practical examination conducted by the faculty, once during the session. In III year it will be 80%.
- 3. **Overall performance:** 10 % of the total internal assessment marks will be awarded during I & II year for each practical paper on the basis of performance and conduct of the student in the practical lab. In III year it will be 20%.

Note: Detailed breakup of Internal Marks awarded as per above guidelines must be submitted to the university in a tabular format for each paper. Department/College must preserve answer books of internal examination for a period one year from the date of examination and must be presented to the university as and when required.

- (a) **I division with distinction:** 75% or more marks in the aggregate provided the candidate has passed all the papers and examinations in the first attempt.
- (b) **I division :** 60% or more marks but fails to satisfy the criteria for being classified as first division with distinction laid in (a).
- (c) **II division :** All other than those included in (a) and (b) above i.e. < 60% and $\ge 45\%$.
- (d) Passing criteria is as per university ordinance. A candidate must pass the examinations within five years of the initial admission to the first year of the course.

B.Sc (Information Technology)

B. Sc. (IT) - I Year Exam. – 2020-21

Paper	Paper Name	Lecture	Duration	Max. Marks		TOTAL
		Hrs./week	of exam.	University	Internal	
			(hours)	Exam.	Assessment	
Paper-I (BIT-101)	Introduction to Information	3	3	75	25	100
	Technology					
Paper-II (BIT-102)	Basic Mathematics	3	3	75	25	100
Paper-III (BIT-103)	Problem Solving through C	3	3	75	25	100
	Programming					
Paper-IV (BIT-104)	Computer Organization &	3	3	75	25	100
	Architecture					
Paper-V (BIT-105)	Data Base Systems	3	3	75	25	100
	Practical					
Practical-I (BIT-106)	Data Base Lab(Using	4(2+2)	3	75	25	100
	MSAccess)					
Practical-II(BIT-107)	Programming Lab	4(2+2)	3	75	25	100
	Total			525	175	700

Courses of Study and Examination

*for each practical paper students have to submit the project.

B. Sc. (IT) - II Year Exam.

2. Courses of Study and Examination

Paper	Paper Name	Lecture	Duration	Max. Marks		TOTAL
		Hrs./week	of exam.	University	Internal	
			(hours)	Exam.	Assessment	
Paper-I (BIT-201)	Computer Oriented	3	3	75	25	100
	Statistical Methods					
Paper-II (BIT-202)	Visual Programming	3	3	75	25	100
Paper-III (BIT-203)	Fundamentals of Operating	3	3	75	25	100
	Systems					
Paper-IV (BIT-204)	Web Technology I	3	3	75	25	100
Paper-V (BIT-205)	Business Organization and	3	3	75	25	100
	Management					
	Practical					
Practical-I (BIT-206)	Visual Programming Lab	4(2+2)	3	75	25	100
Practical-II(BIT-207)	Web Technology Lab	4(2+2)	3	75	25	100
	Total			525	175	700

*for each practical paper students have to submit the project.

B. Sc. (IT) - III Year Exam.

-	Paper Name	Lecture	Duration	Max. Marks		TOTAL
	_	Hrs./week	of exam.	University	Internal	
			(hours)	Exam.	Assessment	
Paper-I (BIT-301)	Programming in Java	3	3	75	25	100
Paper-II (BIT-302)	Client Server Technology	3	3	75	25	100
Paper-III (BIT-303)	System Analysis & Design	3	3	75	25	100
Paper-IV (BIT-304)	Web Technology II	3	3	75	25	100
Paper-V (BIT-305)	Multimedia Tools &	3	3	75	25	100
	Applications					
Practical-I (BIT-306)	System Design Project	4(2+2)	3	75	25	100
Practical-II(BIT-307)	JAVA Lab	4(2+2)	6	75	25	100
	Total			525	175	700
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3. Courses of Study and Examination

B. Sc. (IT) - I Year Exam.- 2020-21

BIT - 101: Introduction to Information Technology

Time: 3 Hrs.

UNIT - I

Max. Marks: 75

Computer Basics: Algorithms, A Simple Model of a Computer, Characteristics of Computer, Problem-solving Using Computers.

Data Representation: Representation of Characters in computers, Representation of Integers, Representation of Fractions, Hexadecimal Representation of Numbers, Decimal to Binary Conversion, Error-detecting codes.

Input & Output Devices: Description of Computer Input Units, Other Input Methods, Computer Output Units.

UNIT - II

Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to Construct Memories, Magnetic Hard Disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives.

Processor: Structure of Instructions, Description of a Processor, Machine Language Programs, An Algorithm to Simulate the Hypothetical computer.

UNIT - III

Binary Arithmetic: Binary Addition, Binary Subtraction, Signed Numbers, Two's Complement Representation of Numbers, Addition/Subtraction of Numbers in 2's Complement Notation, Binary Multiplication, Binary Division, Floating Point Representation of Numbers, Arithmetic Operations with Normalized Floating Point Numbers.

Computer Architecture: Interconnection of Units, Processor to Memory communication, I/O to Processor Communication, Interrupt Structures, Multiprogramming, Processor Features, Reduced Instruction Set Computers (RISC), Virtual Memory.

UNIT-IV

Software Concepts: Types of Software, Software Qualities & Attributes, Programming Languages (Its types and differences).

Operating Systems: Definition, O.S. functions, brief introduction of OS types, A Brief History of Linux, MS-DOS, Windows Operating System.

UNIT - V

Computer Generation & Classifications: First, Second, Third, Fourth and Fifth Generation of computers, Classification of Computers, Concept of Distributed and parallel Computers.

Internet: Concept of Network, World Wide Web, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Service Providers, Introduction to Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet and Extranet.

Text / Reference Books

1. P.K.Sinha "Introduction to Information Technology",

2. V. Rajaraman, "Fundamentals of Computers", 3rd Edition, PHI Publications

3. Nasib S. Gill, "Essentials of Computer & Network Technology", Khanna Publications.

5. Deepak Bharihoke, "Fundamentals of Information Technology", Excel Books.

BIT - 102: Basic Mathematics

Time: 3 Hrs.

Max. Marks: 75

UNIT - I

Number Systems, LCD & GCD, Fibonacci numbers, Sequences and series: AP, GP and HP, Sum of n terms, arithmetic, geometric, harmonic means between two numbers (excluding arithmetic geometric series).

Logarithms: definition, Laws regarding product, quotient, exponent and change of base.

UNIT – II

SETS: Sets, Subsets, Equal Sets, Null set, Universal set, Finite & Infinite sets, Open & Closed sets etc., Operations on Sets, Partition of sets, Cartesian product.

Unit - III

Relations and Functions: relation, properties of relations, equivalence relation, equivalence relation with partition, partial order relation, maximal and minimal points, pigeonhole principle, function, domain and range, onto, into and one-to-one functions, composite functions, inverse functions, introduction of algebraic, trigonometric, logarithmic, exponential, hyperbolic functions, zeros of functions.

$\boldsymbol{UNIT-IV}$

Differentiation: Derivative, derivatives of sum, differences, product & quotients, derivatives of composite functions, logarithmic differentiation, mean value theorem, expansion of functions, (Maclaurin's & Taylor's.), indeterminate forms, L'Hospitals rule, maxima & minima, concavity, asymptote, singular points, curve tracing, successive differentiation & Leibnitz theorem.

UNIT - V

Basic Concepts of Graph Theory: Vertices, edges, degree, paths, circuits, cycles, complete graphs and trees. Multi-graphs, weighted graphs and directed graphs, Adjacency matrix of a graphs. Connected and disconnected graphs. Permutations (Simple and under restrictions), combinations (selections with and without replacement).

Text / Reference Books

- 1. C. L. Liu.: "Elements of Discrete Mathematics", Tata MGraw Hill.
- 2. Thomas, G.B. and R. L. Finney: "Calculus & Analytical Geometry", Addison-Wesley, 9th Edition.
- 3. Chandrika Prasad : "Mathematics for Engineers", Prasad Mudranalaya, Allahabad, 19th edition
- 4. Shanti Narayan: "Differential Calculus", S. Chand & Co.
- 5. Shanti Narayan: "Integral Calculus", S. Chand & Co.

BIT -103: Problem Solving through C Programming

Time: 3 Hrs.

Max. Marks: 75

UNIT-I

Algorithm and Algorithm Development: Definition and properties of algorithm, flow chart Symbols, example of simple algorithms. Program design, errors: syntax error and semantic error, debugging, program verification, testing, documentation and maintenance. Variable names, data type and sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, precedence and order of evaluation, standard input and output statements.

UNIT-II

Control Flow: Statements and blocks, if-else, nested if, switch, looping statement: while, for, do-while, break and continue, go-to and labels.

Arrays : declarations, integer and character array, reading and writing an array, one and two dimensional array, operations on arrays.

UNIT – III

Functions and Program Structure: Basics of function, function definition and declaration, external variables, scope rules, header files, static variables, register variables, block structure, initialization, recursion, the C preprocessor.

Pointer : Pointers and addresses, pointers and function arguments, address arithmetic. Character pointers, pointers to pointers, Pointers to functions.

UNIT - IV

Structures: Basics of structures, structures and functions, arrays of structures, pointers to structures, self-referential structures, type-def, unions.

UNIT - V

File Handling: access methods, different file operations and functions, concept of text & Binary files, file I/O, command line argument, Formatted file input and output.

Text / Reference Books

- 1. Deendayalu R., "Computer science Volume I and II", Second Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.
- 2. Rajaraman V., "Fundamentals of computers", Second Edition, Prentice Hall of India Private Limited, New Delhi.
- 3. Kernighan B.W. and Ritchie D.M., "The C Programming Language", Prentice Hall of India Private Limited New Delhi.
- 4. Dromey R., "How to solve it by computers". Prentice Hall of India Private Limited, New Delhi.

BIT -104 Computer Organization & Architecture

Time: 3 Hrs.

Max. Marks: 75

UNIT- I

Basic Computer Organization: Instruction codes, direct and indirect address, timing and control signal generation, instruction execution cycle, memory reference instructions, input output instructions.

Register Transfer and Micro Operations: Bus and memory transfers, three state bus buffers, binary adder, binary incrementer, arithmetic circuit, and logic and shift micro operations, ALU.

UNIT-II

Central Processing Unit: General register organization, memory stack, one address, two address instructions, data transfer, arithmetic, logical and shift instructions, software and hardware interrupts (only brief introduction), arithmetic and instruction pipelines.

UNIT-III

Computer Arithmetic: Addition and subtraction with signed magnitude data, multiplication algorithms, hardware algorithm and booth algorithm, division algorithm.

UNIT - IV

Input Output Organization: Asynchronous data transfer- handshaking, asynchronous serial transfer, interrupt initiated I/O, DMA transfer, interfacing, peripherals with CPU (introduction), keyboard, mouse, printer, scanner, network card.

UNIT-V

Memory Organization: ROM, RAM, hard disk, CD-ROM, Cache memory- direct mapping scheme, virtual memory concept.

Text / Reference Books

1015

1. Mano M., "Computer System Architecture", Pearson Education.

2. Ram B., "Computer Fundamentals, Architecture & Organisation", New Age International, New Delhi

BIT-105 Data Base Systems

Time: 3 Hrs.

Max. Marks: 75

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UNIT- I

Introduction: Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base administrator, data base users, overall structure, schema and subschema.

UNIT-II

ER Model: entities, mapping constrains, keys, E-R diagram, reduction of E-R diagrams to tables, generation, aggregation, design of an E-R database scheme.

UNIT-III

Network model: basic concepts, data structure diagrams, DBTG CODASYL model, DBTG data retrieval facility, DBTG update facility, DBTG set processing facility, mapping networks to file, networks system.

UNIT-IV

Hierarchical model: basic concepts, tree structure diagrams, data retrieval facility, update facility, virtual records, mapping hierarchical to files, hierarchical system.

UNIT-V

File and system structure: overall system structure, file organisation, logical and physical files organization, sequential and random, indexing and hashing. Introduction to Ms-Access, Data base creation

Text / Reference Books

101R

1. Date C.J., "Database Systems", Addision Wesley.

2. Korth, "Database Systems Concepts", McGraw Hill.

3. Database Management System", Ramakrishna, Gehkre, McGraw - Hill

4. Database management systems", Leon alexis, leon Mathews, "Vikash publication

5. Database system, Rob, coronel, 7th edition, Cenage Learning.