

**M.G.S. UNIVERSITY  
BIKANER**

# **SYLLABUS**

**FACULTY OF SCIENCE**

**BCA PART I EXAMINATION - 2018**



**सूर्य प्रकाशन मन्दिर**

दाऊजी रोड़ (नेहरू मार्ग), बीकानेर 5 (राज.)

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For M.G.S. University, Bikaner

## SCHEME OF EXAMINATION

The Number of paper and the maximum marks for each paper together with the minimum marks required for a pass are shown against each subject separately. It will be necessary for a candidate to pass in the theory part as well as practical part of a subject/ paper, separately. Award of Division to Successful candidates at the end of final year examination shall be as follow:

First Division	60% of the aggregate marks prescribed for cor papers of part I, Part II and Part III Examination, taken together (600 + 600 + 600 =1800). Marks Obtained in compulsory papers will not be counted for award of Division.
Second Division	48%
Pass	above 36%
Fail	Below 36%

**Admission rule to the course will be as par Government / University policy declared from time to time.**

### Teaching and Examination scheme for Bachelor in Computer Application Part-I Exam.

Paper Name (Theory)	Exam Hrs.	Max Marks
Compulsory		
Paper 1 General English	3	100
Paper 2 General Hindi	3	100
Paper 3 Environmental Studies	2	100
Paper 4 Elementary Computer Application Theory	2	100
<b>Core</b>		
BCA-101 Mathematics for Computer Science	3	70
BCA-102 Database Management	3	70
BCA-103 Programming in C++	3	70
BCA-104 Computer Network	3	70
BCA-105 Multimedia & Animation	3	70
BCA-106 Fundamentals of Computer Programing	3	70
<b>Total of Theory</b>		<b>420</b>
<b>Paper Name (Practicals)</b>		
BCA-107 SQL Lab & Mini Project	3	60
BCA-108 C++ Lab & Mini Project	3	60
BCA-109 Multimedia Lab & Mini Project	3	60
<b>Total Practical</b>		<b>180</b>
<b>Grand Total (Theory+Practical)</b>		<b>600</b>

**Teaching and Examination scheme for  
Bachelor in Computer Application  
Part-II Exam. - 2019**

<b>Paper Name (Theory)</b>	<b>Exam Hrs.</b>	<b>Max Marks</b>
<b>Core</b>		
BCA-201 Computer Organization	3	70
BCA-202 OPERating System	3	70
BCA-203 Java	3	70
BCA-204 Internet Programming	3	70
BCA-205(A) Cloud Computing	3	70
BCA-205(B) Data mining	3	70
BCA-206(A) Python	3	70
BCA-206(B) C#	3	70
<b>Total of Theory</b>		<b>420</b>
<b>Paper Name (Practicals)</b>		
BCA-207 Java Lab & Mini Project	3	60
BCA-208 Internet Programming Lab & Mini Project	3	60
BCA-209 Python/C# Lab & Mini Project	3	60
<b>Total Practical</b>		<b>180</b>
<b>Grand Total (Theory+Practical)</b>		<b>600</b>

**Teaching and Examination scheme for  
Bachelor in Computer Application  
Part-III Exam. - 2020**

<b>Paper Name (Theory)</b>	<b>Exam Hrs.</b>	<b>Max Marks</b>
<b>Core</b>		
BCA-301 Software Engineering	3	70
BCA-302 Data Structure	3	70
BCA-303 PHP	3	70
BCA-304(A) Search Engine Optimization	3	70
BCA-304(B) Android Programming	3	70
BCA-305(A) Cyber Security	3	70
BCA-305(B) Internet of Things	3	70
BCA-306 Project	3	70
<b>Total of Theory</b>		<b>420</b>
<b>Paper Name (Practicals)</b>		
BCA-307 Data Structure Lab	3	60
BCA-308 PHP Lab	3	60
BCA-309 Android/SEO Lab	3	60
<b>Total Practical</b>		<b>180</b>
<b>Grand Total (Theory+Practical)</b>		<b>600</b>

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bdkbz & 1

1. भारतवर्ष की उन्नति कैसे हो – भारतेन्दु हरिश्चन्द्र
2. आचरण की सभ्यता – अध्यापक पूर्णसिंह
3. मेघदूत – महावीर प्रसाद द्विवेदी
4. भारतीय संस्कृति की देन – हजारी प्रसाद द्विवेदी
5. लिपि की सत्ता – भगवती शरण उपाध्याय
6. गिल्लू – महादेवी वर्मा
7. सवालों की नोक पर – मोहन राकेश
8. निन्दा रस – हरिशंकर परसाई
9. नेता नहीं नागरिक चाहिए – रामधारी सिंह दिनकर
10. हमारा समय और विज्ञान – गुणाकर मुले
11. साफ माथे का समाज – अनुपम मिश्र

bdkbz & 2

1. कर्मवीर – अयोध्या सिंह हरिऔध
2. भू-लोक का गौरव – संदेश यहाँ मैं नहीं स्वर्ग का लाया – (भारत भारती)– मैथिलीशरण गुप्त
3. बीती विभावरी जागरी । अरुण यह मधुमय देश हमारा – जय शंकर प्रसाद
4. तोड़ती पत्थर – सूर्यकांत त्रिपाठी निराला
5. पथ की पहचान – हरिवंश राय बच्चन
6. प्रेत का बयान – नागार्जुन
7. जब-जब मैंने उसको देखा । यह धरती उस किसान की – केदारनाथ अग्रवाल
8. जल रहे दीप जलती है जवानी (भाग 2) तुम मनाते हो जिसे कहकर दिवालीकृ दमन की धमक झेली थी – षिवमंगल सिंह सुमन
9. गीत फरोश –भवानी प्रसाद मिश्र
10. देश की नस्लें, बात करो, अपने – सरल विशारद

bdkbz & 3

1. संक्षेपण
2. पल्लवन
3. शब्द युग्म
4. लोकोक्ति
5. शुद्धीकरण – शब्द , वाक्य

bdkbz & 4

1. अनुवाद – अर्थ और सिद्धान्त, महत्त्व, आदर्श, अनुवाद की विशेषताएं
2. राजस्थानी एवं अंग्रेजी से हिन्दी अनुवाद (एक अनुच्छेद)

### bdkbz & 5

1. किसी एक विषय पर निबंध

2. पत्र-प्रारूप

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1. प्रश्न-पत्र इकाइयों में विभक्त हों।

2. प्रत्येक इकाई से निर्देशानुसार व्याख्यात्मक एवं आलोचनात्मक प्रश्न पूछे जाएँ।

3. प्रश्न-पत्र वर्तमान में निर्धारित पाठ्यक्रमानुसार हो।

foLr'r vad folkkttu

### bdkbz & 1

अ - चार व्याख्याएं पूछी जाएंगी, जिनमें से दो करनी होगी।

शब्द सीमा : 150 अंक : 10, 1 x 10 = 10

ब - चार आलोचनात्मक प्रश्न पूछे जाएंगे, जिनमें से दो करने होंगे।

शब्द सीमा : 250 अंक : 7, 2 x 7 = 14

### bdkbz & 2

अ - चार व्याख्याएं पूछी जाएंगी, जिनमें से दो करनी होंगी।

शब्द सीमा : 150 अंक : 10, 1 x 10 = 10

ब - चार आलोचनात्मक प्रश्न पूछे जाएंगे, जिनमें से दो करने होंगे।

शब्द सीमा : 250 अंक : 7, 2 x 7 = 14

### bdkbz & 3

अ - संक्षेपण

5

ब- पल्लवन

4

स- शब्द युग्म

4

द - लोकोक्ति व मुहावरे

5

य- शुद्धीकरण , क-शब्द शुद्धीकरण, ख- वाक्य शुद्धीकरण

4

22

### bdkbz & 4

अ - अनुवाद : अर्थ, सिद्धान्त, विशिष्टता आदि से संबंधित दो प्रश्न।

सीमा - 50 शब्द, अंक 3, 2 x 03 = 06

ब- राजस्थानी एवं अंग्रेजी से हिंदी अनुच्छेद का अनुवाद।

सीमा - 300 शब्द, अंक 9 , 1 x 09 = 09

### bdkbz & 5

अ- किसी एक विषय पर निबन्ध।

सीमा - 350 शब्द, अंक - 10, 1 x 10 = 10

ब- पत्र-प्रारूप।

सीमा - 100 शब्द, अंक 5, 1 x 5 = 05

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1- हिन्दी साहित्य का इतिहास - आचार्य रामचन्द्र शुक्ल

- 2- हिन्दी साहित्य का इतिहास – डॉ. नगेन्द्र
- 3- हिन्दी में अशुद्धियां – रमेश चन्द्र महरोत्रा
- 4- अच्छी हिन्दी – रामचन्द्र वर्मा
- 5- हिन्दी व्याकरण – डॉ. हरदेव बाहरी
- 6- प्रयोजनमूलक हिन्दी – प्रो. सूर्यप्रकाश दीक्षित
- 7- हिन्दी शब्द मीमांसा– किशोरी दास वाजपेयी
- 8- व्यावहारिक हिन्दी व्याकरण – राघव प्रकाश

## 2. General English

(Common for B.A/B.Com/B.Sc/B.B.M)

### A. Grammar

[10 Marks]

- Determiners
- Tenses and Concord
- Auxiliaries
- Prepositions
- Basic Sentence Patterns

### B. Transformations

[10 Marks]

- Active to Passive Voice
- Simple to Compound / Complex
- Declarative into Negative/ Interrogative
- Direct to Indirect Speech

### C. Comprehension

[50Marks]

Comprehension of an Unseen Passage[10 Marks]

Comprehension (from the following Texts): Comprehension based Questions of 10 Marks each will be asked from Prose, Short Stories, One Act Play and Poetry [40 Marks]

#### Prose

- Digital India
- A.P.J. Abdul Kalam: The Power of Prayer
- Martin Luther King: I have a Dream
- Albert Einstein: The World as I see it

#### Short Stories

- Leo Tolstoy: The Three Questions
- Nachiketa

#### One Act Play

- Cedric Mount: The Never Never Nest

#### Poetry

- R.N. Tagore : Heaven of Freedom
- John Donne : Death be not Proud
- Swami Vivekanand : Kali the Mother

Required Readings: ***Emerald*** (Macmillan)

### D. Written Composition

[30 Marks]

Precis Writing [5 Marks]

Paragraph Writing [10 Marks]

Letter Writing(Formal and Informal)[5 Marks]

Report Writing[10 Marks]

*Suggested Readings:*

Murphy, Raymond: *Intermediate English Grammar* ( OUP)

Huddleton, Rodney: *English Grammar: An Outline* (OUP)

Greenbaum, Sidney: *The Oxford English Grammar* (OUP)

### 3. Elementary Computer Applications

Max. Marks : 100

Min . Passing Marks : 36

Time : 3 Hours

**Note:**

1. Passing in theory examination shall be necessary by securing at least 36% marks.
2. The theory paper shall consist of 50 objective type questions. Each will carry 2 marks. Candidate will have to write correct answer (A) or (B) or (C) or (D) in space provided against the questions on OMR sheet.

Introduction to Information Technology, Generation of Computers, Types of computers: Micro, Mini, Mainframe, Super.

Architecture of Computer System: CPU, Primary Memory: RAM, ROM, Cache memory, Secondary memories, Input/output devices, Pointing device.

Number System and their conversions: Binary, Octal, Decimal, Hexadecimal. Logic gates. Languages: Machine, assembly and High Level Languages including 3GL, 4GL.

Concept of Operating System, Need and Types of Operating System: Batch, Single User, Multiprocessing, Time Sharing. Introduction to Windows.

**Internet:** Concept, e-mail services, WWW, Web Browsers, Search Engines, Simple programs in HTML, type of HTML Documents, Document Structures: Element, type and Character Formatting, Tables, Frames, Forms. Style Sheets.

Computer Networking: Type of networks, LAN, MAN and WAN, Concept of topology, Bridges, Routers, Gateways, Modem, ISDN Leased lines, teleconferencing and videoconferencing.

**E-Commerce:** Concept of E-Commerce, benefits and growth of E-Commerce, E-Commerce categories, E-Governance, EDI, Electronic Funds transfer on EDI networks, Electronic Payment System.



## References:

1. Computer Fundamentals By P.K. Sinha (BPB Publications)
2. Computer made Easy for Beginners(in Hindi) By Niranjana Bansal, Jayshri Saragoi
3. IT Tools and Application by Satish Jain, Shashank Jain, Dr. Madulika Jain(BPB Publication)
4. Rapidex Computer Course By Vikas Gupta(PustakMahal)
5. Internet and Web page Designing By V.K. Jain(BPB Publications)
6. Web Enabled Commercial Application Development using HTML, DHTML, Java Script, Perl CGI By Ivan Bayross (BPB Publications)

## 4. ENVIRONMENTAL STUDIES

Max. Marks: 100

Min. Passing Marks: 36

### Note.

1. The marks secured in this paper shall not be counted in awarding the division to a candidate.
2. The candidate have to clear compulsory paper in three years.
3. Non appearing or absent in the examination of compulsory paper will be counted a chance.

### The syllables and scheme of examination is as under:

Compulsory in 1<sup>st</sup> year for all streams at undergraduate level

### SCHEME OF EXAMINATION

1. The paper will be of 100 marks.
2. There will be no practical/Field work, instead student should be aware of ecology of local area; the question related to field work of local area can be asked by paper setter.
3. There will be 100 questions in the paper of multiple choice, each question of 1 mark.
4. There will be no negative marking in the assessment.

Core Module syllabus for Environmental Studies for Under Graduate Courses of All Branches of Higher Education

### Unit-1 : The multidisciplinary nature of environmental studies.

- Definition scope and awareness.
- Need for public awareness.

### Unit-2 : Natural Resources :

- Renewable and non-renewable resources
- Natural resources and associated problems.
- Forest resources.
- Use and over-exploitation.
- Deforestation.
- Timber exploitation.

- Mining
- Dams and their effects on forests and tribal people.
- Water resources.
- Use and over utilization of surface and ground water.
- Floods
- Drought
- Conflicts over water
- Dams benefits and problems.
- Mineral resources.
- Use and exploitation.
- Environmental effects of extracting and using mineral resources.
- Food resources.
- World food problems.
- Changes caused by agriculture and overgrazing.
- Effects of modern agriculture.
- Fertilizer, pesticide problems.
- Water logging.
- Salinity

#### **Energy resources :**

- Growing energy needs.
- Renewable and non-renewable energy resources.
- Use of alternate energy resources.

#### **Land resources :**

- Land as a resource.
- Land degradation.
- Man induced land slides.
- Soil erosion & desertification.

Role of an individual in conservation of natural resources. Equitable use of natural resources for sustainable system.

#### **Unit-3 : Ecosystem:**

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction types, characteristic features, structure and function of the following ecosystems.
- Forest ecosystem.
- Grassland ecosystem
- Desert ecosystem.
- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans estuaries).

#### **Unit-4 : Biodiversity and its conservation:**

- Introduction, definition and diversity at genetic, species and ecosystem level.
- Biogeographically classification of India.
- Value of biodiversity, consumptive use productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, national & local levels.
- India as a mega-diversity nation.
- Hot-spots of biodiversity.
- Threats to biodiversity - habitat loss poaching of wild life, man-wild life conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity – In situ and Ex-situ conservation of biodiversity.

#### **Unit-5 : Environmental Pollution :**

- Definition, causes, effect and control measures of
- Air pollution.
- Water pollution
- Soil pollution.
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear hazards.
- Solid waste management : Causes, effects and control measures of urban industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster management : Flood, earthquake, cyclone and land slides.

#### **Unit-6 : Social issues and the environment :**

- From unsustainable to sustainable development
- Urban problems related to energy.
- Water conservation, rain water harvesting, water shed management.
- Settlement and rehabilitation of people, its problem of concerns.
- Environmental ethics-issues and possible solutions. Ozone layer depletion, nuclear accidents.
- Wasteland reclamation.
- Consumerism and waste products.
- Environmental protection Act.1986.
- i. Air (prevention and control pollution) Act. 1981
- ii. Water (Prevention and Control of Pollution) Act., 1974.
- iii. Wild life protection Act. 1972
- iv. Forest conservation Act.1980
- Issues involved in enforcement of environmental legislation.
- Public awareness.

### Unit-7 : Human Population and the Environment :

- Population growth, variation among nations.
- Population explosion-Family welfare programme.
- Environment and Human health.
- Human rights.
- Value education.
- HIV/AIDS
- Women & child welfare.
- Role of information technology in environment and human health.

#### Field Work

- Visit to a local area to document environmental assets-river/forest/ grassland/ hill/ mountain.
- Visit to local polluted site- Urban/rural/industrial/agricultural.
- Study of common plants, insects. Birds.
- Study of simple ecosystem-Pond, river, hill slope etc.

#### Suggested Books :

- |                         |   |
|-------------------------|---|
| 1 पर्यावरण अध्ययन       | — वर्मा, गैना, खण्डेलवाल, रावत            |
| 2 पर्यावरण विज्ञान      | — पी.सी. त्रिवेदी, गरिमा गुप्ता           |
| 3 पर्यावरण अध्ययन       | — सुरेश आमेता, षिप्रा भारद्वाज            |
| 4 Environmental studies | - Pratap Singh, N.S. Rathore, A.N. Mathur |
| 5 पर्यावरण अध्ययन       | — बाकरे, बाकरे वाधवा                      |
| 6 पर्यावरण अध्ययन       | — मनोज यादव, अनूपमा यादव                  |

### BCA - I YEAR

#### Note:

1. At least 3 hrs theory and 3 hrs practical slot should be assigned per week for each paper.

#### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

3. Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of MGS University. External Examiner will prepare question paper of Practical Examination. Students have to perform exercise on computer. Exercise must be written in answer books in proper documentation.

4. Marks distribution for Practical of 60 marks is as under-
5. The student has to select one of the topics given in the syllabus for mini project.
6. Marks distribution for Project of 70 marks is as under
  - a) Project Dissertation and Presentation 40 Marks
  - b) External Viva Voce 30 Marks Duration: 3 Hours MM: 70

### **BCA-101: Mathematics for Computer Science**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit-I**

Matrices: Basic Definitions, matrix operations- addition, multiplication, transpose, Adjoint and inverse. Determination of a square matrix (up to 3X3 matrix)

#### **Unit-II**

Statements (Propositions), Logical Operations, Truth Table, Tautologies, Contradiction, Logical Equivalence, Algebra of Propositions, Conditional and bi-conditional Statement, Argument, Logical Implication, Propositional Functions, Quantifiers, Negation of Quantifiers Statements, Normal.

#### **Unit-III**

Integers: Properties of integers, order and inequalities, Absolute value, Mathematical Induction, Division Algorithm, Divisibility, Primes, Greatest Common Divisor (GCD), Euclidean Algorithm, Fundamental Theorem of Arithmetic, congruence Relation.

#### **Unit-IV**

Sets: Introduction, Sets and their representations, empty set, Finite & infinite sets, equal sets, subsets, power sets, universal sets, complements of a set. Cartesian products of sets.

#### **Unit-V**

Relations: Types of relations, reflexive, symmetric, transitive and equivalence relations. Functions: one to one and onto functions, composite functions, inverse of a function, Binary operations, recursively defined functions.

#### **Suggested Readings:**

- ♦ Mathematics Volume I By R.D. Sharma (Dhanpat Rai Publication)
- ♦ Mathematics Volume II By R.D. Sharma (Dhanpat Rai Publication)

- ♦ Engineering Mathematics Volume I By S.S. sastry (Prentice-Hall of India)
- ♦ Discrete mathematics Schaum's Series By Seymour LipSchutz, Marc Lipson (Tata McGraw Hill)
- ♦ Discrete mathematics By Vinay Kumar (BPB)
- ♦ Discrete mathematical Structure By Dr. K.C. Jain, Dr. M.L. Rawat.

**Duration: 3 Hours MM: 70**

## **BCA-102: Database Management**

### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit I**

Introduction: Characteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Database languages and interfaces; E-R Model : Entities, Attributes, keys, Relationships, Roles, Dependencies, E-R Diagram.

#### **Unit II**

Introduction to Relational model, Constraints: Domain, Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; Relational algebra: select, project, union, intersection, cross product, different types of join operations.

#### **Unit III**

SQL: Data Types, statements: select, insert, update, delete, create, alter, drop; views, SQL algebraic operations; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Functions, Triggers.

#### **Unit IV**

Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF; Transactions processing: Definition, desirable properties of transactions, serial and non-serial schedules, concept of serializability, conflict-serializable schedules.

#### **Unit V**

Concurrency Control: Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp

ordering algorithm; Overview of database recovery techniques; concept of data warehousing.

### **Suggested Readings:**

1. Fundamentals of Database Systems, Ramez A. Elmasri, Shamkant Navathe, 5<sup>th</sup> Ed (Pearson)
2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)
3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)
4. SQL, PL/SQL Programming By Ivan Bayross (BPB)
5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)
6. <http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx>

Duration: 3 Hours MM: 70

### **BCA-103: Programming in C++**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit I**

Object Oriented System: Difference Between Procedural and Object Oriented Languages, Object Oriented Paradigm, Inheritance, Polymorphism, Abstraction, Encapsulation, Benefits and Application of OOPS. Introduction to C++: Character Set, Token, Constants, Variables and Data Types, Enumeration Types, Operators, Expressions, Operator Precedence and Associativity, Integer Overflow and Underflow, Input, Output, Conditional Statements, Scope of Variables, Type Conversion.

#### **Unit II**

Iteration : while, do while, for, Break, Continue, goto; Pointers: Introduction, implementation advantage and disadvantage. Functions - Standard and User-Defined Function, Recursive Function, Passing By Value And Reference, Function Overloading Pointer and Function: Function Returning Pointer, Passing pointer as argument, Reference and Functions. Structures and Pointers.

#### **Unit III**

Array: introduction, advantage, One, Two and Multidimensional, Passing Array to a Function, Array and Pointers : Pointer to One and Two Dimensional Arrays, Array of Pointers. Dynamic Arrays, String Processing. Class: Introduction to Class and Object, Declaring Members and Methods in a class, declaring objects.

### Unit IV

Functions and objects: Calling member functions, Passing objects as arguments, Functions Returning Objects. Inline Function, Friend Functions and Its Usage, Abstract Class, Function Overriding. Constructor and Destructor- Needs and Its Usage, Types of Constructors, Destructor, Pointer to Objects, Pointers to Members, Dynamic Class and Objects, Static Data Members and Methods. Inheritance - Need of Inheritance, Types of Inheritance and its implementation.

### Unit V

Operator Overloading: Need and Rules of Operator Overloading, Overloading Through Member Function and Friend Function. Type Conversion- Basic to Class, Class to Basic, One Class to Another Class. Compile Time and Run Time Polymorphism- Virtual Function and virtual class. String Class, Stream Classes in C++, Manipulators, Templates and File Handling,

#### References:

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Schildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)

**Duration: 3 Hours**

**MM: 70**

## BCA-104 Computer Networks

### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

### Unit - I

**Data Communication and Networking:** Overview, Network Types, LAN Technologies, Topologies, Models- OSI Model, TCP/IP Stack

### Unit - II

**Physical Layer:** Introduction, Digital Transmission, modes, digital to digital, analog to digital, Analog Transmission, digital to analog, analog to analog, Transmission media, Wireless Transmission, **Switching techniques:** Circuit Switching, Packet switching, Message switching.

### Unit - III

**Data Link Layer:** Introduction, Data Link Control: Line Discipline- Enq/Ack, Poll/Select, **Flow Control** : Stop And Wait, Sliding Window, **Error Control** : ARQ, Stop and Wait ARQ, Sliding Window ARQ.



### Unit - IV

**Network Layer:** Introduction, Network Addressing, Routing, Internetworking, Tunneling, Packet Fragmentation, Network Layer Protocols, ARP, ICMP, IPv4, IPv6

### Unit V

**Transport Layer:** Introduction, Transmission Control Protocol, User Datagram Protocol

**Application Layer:** Introduction, Client-Server Model, Application Protocols.

### Suggested Readings-

1. Computer Forensics by Marie- Helen Maras
2. Data Communication and Networking By Forozan (Tata McGraw Hill)
3. Data Communication And Computer Networks By Dr. Madhulika Jain, Satish Jain (BPB)
4. William Stallings, "Data and Computer Communications", Pearson Education, 2008.
5. Rajneesh Agrawal and Bharat Bhushan Tiwari, "Data Communication and Computer Networks", Vikas Publishing house Ltd., 2005.
6. A. S. Tanenbaum, "Computer Networks", Fourth Edition, Pearson Education.
7. A. Leon-Gracia and I. Widjaja, "Communication Networks", Tata McGraw Hill, 2004.

Duration: 3 Hours

MM: 70

### BCA-105 Multimedia & Animations

#### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

### Unit I

Basics: Pixels, resolution of display unit; definition of multimedia, delivering multimedia; Text: Fonts & Faces, Using Text in Multimedia; Images:bitmaps, vector drawing, 3D drawing, file formats ; Sounds: digital audio and file formats , Videos: working of video, analog and digital video, file formats; multimedia applications.

## Unit II

Concept of lossy and lossless compression, concept of translating, scaling and rotating an object in 2D and 3D; Color Models :RGB, CMY, HSV; Overview of concepts: Clipping, orthographic and parallel projection, lighting, transparency, texturing, rendering.

## Unit III

Animations : Principles of animations, Animation techniques, Animation file formats. Concept of 2D and 3D animation, Animation tools.

## Unit IV

Blender: GUI Interface, Selecting, rotating and Translating Objects, Using Snap to move objects precisely, Creating mesh primitives and extrusions, Subdividing meshes, Creating a simple creature, Joining mesh objects and stitching vertices, Organizing a scene with layers, groups, and hierarchies.

## Unit V

Blender: Assigning glossy and reflective materials to objects, Creating bump maps, Creating sky and ambient light, Understanding ambient occlusion, Adding motion blur and depth of field, Editing animation in the Graph Editor, Building and animating a simple character.

### Suggested Readings:

1. Multimedia making it work, TMH, Tay Vaughan.
2. Multimedia: Computing, Communications Applications, Pearson, Ralf Steinmetz and Klara Naharstedt,
3. Multimedia Handbook, TMH, Keyes.
4. K. Multimedia System Design, PHI, Andleigh and K. Thakkar.
5. Web Resource - Animation
7. Web Resource – Blender
8. Web Resource- A Beginners Guide to Blender
9. Web Resource- Blender
10. Web Resource- Introduction to Blender
11. Web Resource- Blender Basics
12. Web Resource- Blender Manual
13. Computer Graphics by D Hearn and P M Baker, Printice Hall of India (Indian Edition).

**Duration: 3 Hours**

**MM: 70**

### BCA-106 Fundamentals of Computer Programming

#### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any

three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### **Unit I**

Algorithm; Generalized Algorithms; Avoiding infinite loops in Algorithms- By Counting, by using sentinel value; Different ways of Representing an Algorithm-As a Program, As a Flowchart, As a Pseudo Code; Need for Planning a program before coding, Program Planning Tools- Flow Charts, Structure Charts, Pseudo codes

### **Unit II**

Programming Techniques: Top down, Bottom up, Modular, Structured, Features, Merits, Demerits and their Comparative study. Importance of use of indentation in programming; structured Programming concepts- Need of careful use of "GoTo Statement"; Sequence Logic, selection logic, logic and iteration Logic, functions

### **Unit III**

Programming Language: Types –Machine, Assembly and High –level Languages; Scripting and Natural Languages; Their relative advantages and Limitations; High Level Programming Language Tools- Compiler, Linker, Interpreter, Intermediate Language Compiler and Interpreter, Editor

### **Unit IV**

Overview of some popular High Level Languages- FORTRAN, COBOL, BASIC, Pascal, C, C++, JAVA, LISP, PROLOG, PYTHON; Characteristics of a Good Programming Language; Selecting a Language out of many available languages for coding an Application; Subprograms.

### **Unit V**

Testing and Debugging: Difference; Types of Program errors ; Testing a Program; Debugging a program for Syntax Errors; Debugging a program Logic Errors; Concepts of APIs and Libraries. Program Documentation: Need for Documenting Programs and Software; Forms of Documentation- Comments, System Manual, User Manual; Documentation Standards and Notations

### **Suggested Readings-**

1. Fundamentals of Programming languages by Ellis Holowitz, Springer
2. Fundamentals of Programming languages by Tolani, Pearson
3. Programming Languages: Principles and paradigms by Maurizio Gabbriellini and Simone Martini, Springer
4. Programming Language Concepts by Ghezzi, Milano, Jazayeri, Wien, John Wiley & Sons

### **BCA-107 SQL Lab and Mini Project**

1. Design a database your College Alumni Association
2. Draw an ER Diagram for a Library Management System

3. Design a database for a Hospital Management System
4. Create a table "Users" with username and passwords. Display username with its password strength (weal/average/good). Password strength should be calculated by following criteria-
  - For each uppercase letter, lower case letter, number and special symbol, weight = +1
  - If password starts with a symbol other than a letter, weight = -1
  - Password with length <8, weight = +2, password length >8, weight = -2

### **BCA-108 C++ Lab and Mini Project**

1. Design your Home Electricity Bill
2. Design books database using structure
3. Program for Sparse Matrix
4. Design a simple calculator
5. Program for reading from and writing to a random file.

### **BCA 109 Multimedia Lab and Mini Project**

1. Create and animate a simple rolling glass ball on the floor using Blender.
2. Create 3D logo for your college using Blender.
3. Create a simple character in Blender put it the walking motion.
4. Create a character and animate its swelling up with pride as it receives some praise.
5. Create and animate a fight between two characters (big vs small, etc) in Blender.

### **Teaching and Examination scheme for**

### **Bachelor in Computer Application**

### **Part-II Exam. – 2019**

Duration: 3 Hours

MM: 70

### **BCA-201 Computer Organization**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### **Unit I**

**Components of a Computer:** Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware Software Interaction. **Number System:** Concept of Bit and Byte, types and

conversion. **Complements:** 1's complement, 2's complement. **Binary Arithmetic:** Addition, overflow, subtraction.

### Unit II

**Logic gates:** Boolean Algebra, Map Simplification. **Combinational circuits:** Half Adder, Full Adder, Decoders, Multiplexers. **Sequential circuits:** Flip Flops- SR, JK, D, T Flip-Flop.

### Unit IV

**Input Output Organization:** Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Direct Memory Access, I/O Processor.

### Unit V

**Memory Organization:** Types and capacity of Memory, Memory Hierarchy, Cache Memory, Virtual Memory.

### Unit III

**Central Processing Unit:** Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Mode, Data Transfer and Manipulation, Program Control.

### Suggested Readings-

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)
2. Carter Nicholas, "Computer Architecture", Schaun outline Sevies , Tata McGraw-Hill.
3. J.P. Hayes, "Computer Architecture & Organization", Tata McGraw Hill
4. Digital Computer Electronics By Malvino Leach, Jerald A. Brown(McGraw Hill)

Duration: 3 Hours

MM: 70

## BCA-202 Operating System

### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

### Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch.

### **Unit II**

CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling.

### **Unit III**

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock.

### **Unit IV**

Memory Management: Physical and virtual address space, Paging, Overview of Segmentation; Virtual Memory Management: Concept, Page Replacement technique- FIFO. Linux: features of Linux, steps of Installation, Shell and kernel, Directory structure.

### **Unit V**

Linux: Users and groups, file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script, shell variables, read and expr, decision making (if else), for and while loops.

#### **Suggested Readings:**

1. Operating System Principals By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)
2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)
3. Modern Operating System Andrew S. Tanenbaum, Herbert Bos
4. Linux in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and applications , TMH, Sumitabha Das

Duration: 3 Hours

MM: 70

### **BCA-203 Java**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

### **Unit I**

**Introduction to java:** evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data

types, type casting, statements, Operators and Expression; Conditional Statements and Loop Statements.

### Unit II

**Class:** syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods. Arrays, Strings and Vectors.

### Unit - III

**Inheritance:** types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes. Interface, Packages and visibility controls.

### Unit - IV

**Errors and Exceptions:** Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments. **Multithreaded Programming:** Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication, Implementing the Runnable Interface;

### Unit - V

**Applet:** Applet Life Cycle, Applet Tag, Adding Applet to HTML File; Passing Parameters to Applets, Getting Input From User. **AWT :** AWT Classes, Working With Frame Windows, Working With Graphics, Working With Colour, Adding And Removing Controls, Responding To Controls, Labels, Buttons, Checkbox, Checkbox Group, Choice Control, Lists, Text Field, Text Area. Menus, Dialog Box, Handling Events.

### Suggested Readings

1. The Complete reference Java Ninth Edition By Herbert Schildt (Tata McGraw Hill)
2. Core Java Volume I—Fundamentals (9th Edition) by Cay S. Horstmann, Gary Cornell, Prentice Hall
3. Java: A Beginner's Guide, Sixth Edition: A Beginner's Guide by Herbert Schildt, McGraw-Hill Osborne Media
4. Programming in JAVA By E. Balagurusamy (TMH)
5. JAVA 2 programming Black Book By Steven Holzner et al. (Dreamtech Press)
6. Horstmann, Cay S. and Gary Cornell, "Core Java 2: Fundamentals Vol. 1", Pearson Education.

Duration: 3 Hours

MM: 70

### BCA-204 Internet Programming

#### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five

questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### **Unit I**

Internet Basics: Evolution of Internet, Basic internet terms and applications. ISP, Anatomy of an e-mail Message, basic of sending and receiving, E-mail Protocol; Mailing List- Subscribing, Unsubscribing.

### **Unit II**

Introduction to World Wide Web and its work, Web Browsers, Search Engine, Downloading, Hyper Text Transfer Protocol (HTTP), URL, Web Servers, FTP, Web publishing- Domain Name Registration, Space on Host Server for Web Site, Maintain and Updating.

### **Unit III**

HTML: Elements of HTML & Syntax, Comments, Headings, Paragraph, Span, Pre Tags, Backgrounds, Formatting tags, Images, Hyperlinks, div tag, List Type and its Tags, Table Layout, div, Use of Forms in Web Pages.

### **Unit IV**

CSS: Introduction to Cascading Style Sheets, Types of Style Sheets (Inline, Internal and External), using Id and Classes, CSS properties: Background Properties, Box Model Properties, Margin, Padding, List Properties, Border Properties

### **Unit V**

**Java Script:** Introduction to Client Side Scripting, Introduction to Java Script, Comments, Variables in JS, Global Variables, Data types, Operators in JS, Conditions Statements (If, If Else, Switch), Java Script Loops (For Loop, While Loop, Do While Loop), JS Popup Boxes (Alert, Prompt, Confirm), JS Events, JS Arrays, JS Objects.

### **Reference:**

1. Thomas A. Powell , "HTML: The Complete Reference", Osborne/ McGraw-Hill
2. Deitel, Deitel and Nieto : Internet & WWW. How to program, 2<sup>nd</sup> Edition, Pearson Education Asia.
3. Bayross, "Web Enabled Commercial Applications Development Using HTML, DHTML, Java Script, Perl CGI," Third Edition, BPB Publications.
4. Internet and Web Page Designing By V.K Jain (BPB)
5. Web Enabled Commercial Application Development Using HTML, DHTML , java script, Perl CGI By Ivan Bayross (BPB)

Duration: 3 Hours MM: 70



## **BCA-205 (A) Cloud Computing**

### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit I**

Introduction to Client – Server Computing, Peer-to-Peer Computing, Distributed Computing, Collaborative Computing, Cloud Computing

#### **Unit II**

Functioning of Cloud Computing, Cloud Architecture, Cloud Storage, Cloud Services – SaaS, IaaS, PaaS, DaaS and VDI etc.

#### **Unit II**

Cloud as Web-Based Application, Cloud Service Development: Pros and Cons, Types, Software as a Service, Platform as a Service, Web Services, On-Demand computing

Discovering Cloud Services, Development Services and Tools, overview of major Cloud Service providers- Amazon Ec2, Google App Engine, IBM Clouds, Eucalyptus etc.

#### **Unit III**

Application of Cloud Computing for Centralizing Email communications, collaborating on Schedules, Calendars, To-Do Lists, Contact Lists. Cloud for the Community, Group Projects and Events; Cloud Computing for the Corporation. Cloud Computing for Schedules and Task Management, Exploring Online Scheduling Applications and Online Planning and Task Management;

#### **Unit IV**

Cloud Computing Collaborating on Event Management, Contact Management and Collaborating on Project Management. Cloud Collaborating on Word Processing, Databases, Storing and Sharing Files; Evaluating Web Mail Services, Evaluating Web Conference Tools; Cloud computing and Social Networks, Groupware, Blogs and Wikis.

#### **Unit V**

Data privacy and security Issues and other risks in Cloud Computing

#### **Suggested Readings-**

1. Cloud Computing Concepts Technology and Architecture by Thomas Erl, Prentice Hall
2. Cloud Computing Principles and Paradigm by Rajkumar Buyya, James Broberg, Andrzej Goscinski, Wiley Publications

3. CloudComputingTheoryAndPractice by Dan C. Marinescu, Morgan Kaufman Publications

Duration: 3 Hours

MM: 70

### **BCA-205(B) Data Mining**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit I**

Data mining Introduction: Definition, Data mining tasks, Data mining as a step of Knowledge discovery process, Applications of Data mining; Data objects and types of attributes, Recalling mean, median ,mode and weighted arithmetic mean.

#### **Unit II**

Data quality , overview of data preprocessing. Classification analysis- definition, Overview of various classification techniques; Decision tree induction- working, examples ,specifying attribute test conditions.

#### **Unit III**

Evaluating the performance of a classifier- Holdout method, Random subsampling , cross-validation, Bootstrap; Association analysis: support, confidence, association rules ,Frequent Item sets.

#### **Unit IV**

Frequent itemset generation - Apriori principle , Apriori algorithm and examples, FP growth algorithm and examples.

#### **Unit V**

Cluster analysis: Definition , overview of basic clustering methods, Density based methods-DBSCAN.

#### **Suggested Readings:**

1. Data Mining: Concepts and Techniques, 3rd edition, Jiawei Han and Micheline Kamber
2. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education.
3. Data Mining: A Tutorial Based Primer, Richard Roiger, Michael Geatz, Pearson Education 2003.
4. Introduction to Data Mining with Case Studies, G.K. Gupta, PHI 2006

5. Insight into Data mining: Theory and Practice, Soman K. P., DiwakarShyam, Ajay V., PHI 2006
6. Data Mining:: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data Management Systems) by Witten, Frank, Hall

Duration: 3 Hours

MM: 70

### **BCA-206 (A) Python**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit I**

Overview of Programming : Structure of a Python Program, Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators(Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

#### **Unit II**

Creating Python Programs : Input and Output Statements, Control statements(Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments, Errors and Exceptions.

#### **Unit III**

Iteration and Recursion: Conditional execution, Alternative execution, Nested conditionals, The return statement, Recursion, Stack diagrams for recursive functions, Multiple assignment, The while statement, Tables, Two-dimensional tables.

#### **Unit IV**

Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison, Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists .

#### **Unit V**

Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries. Overview of stacks and queues. Overview of packages - Networks, Matplotlib.pyplot, numpy.

### **Suggested Readings:**

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Web Resource - Python
3. Web Resource – Python
4. Web Resource- Think Python
5. Web Resource - Python tutorial

Duration: 3 Hours

MM: 70

### **BCA-206 (B) C#**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit - I**

What is C#, C++ vs C#, Java vs C#, History, Features, Environment, Program Structure, basic syntax, Variables, Constants, Data Types, Type Conversion, Operators, Keywords, Control Statement, if-else, switch, For Loop, While Loop, Do-While Loop, Break, Continue, Goto, Comments, Arrays, Multidimensional Array, Jagged Arrays

#### **Unit - II**

Object Class, Object and Class, attributes, Constructor, Destructor, this, static, static class, static constructor, Struct, Enum

#### **Unit - III**

Inheritance, Aggregation, Polymorphism, Member Overloading, Method Overriding, Sealed, Abstract, Interface, partial class

#### **Unit - IV**

Namespace, Strings, Exception Handling, File IO, Serialization, Collections, List<T>, Stack<T>, Queue<T>, LinkedList<T>, generics, nullable type

#### **Unit - V**

Properties, indexers, Delegates and events, Reflection, Multithreading

#### **Suggested Readings-**

- ◆ Beginning C# Object Oriented Programming by Syed Shanu (C# Corner)
- ◆ Beginning C# 6 Programming with Visual Studio 2015 by Benjamin Perkins, Jacob Vibe Hammer, Jon D. Reid (Wrox)
- ◆ C# 6.0 in a Nutshell: The Definitive Reference 6th Edition by Joseph Albahari and Ben Albahari

- ◆ Pro C# 5.0 and the .NET 4.5 Framework (Expert's Voice in .NET) 6th Edition by Andrew Troelsen
- ◆ Programming C# for Beginners (Mahesh Chand)

### **BCA-207 Java Lab and Mini Project**

1. Design Digital clock using applet
2. Design Calculator using AWT with basic functionality on +,-,\*,/ and=.
3. Design Indian Flag using Applet.
4. Design analog clock using applet
5. Design program to display fibonacci series in AWT Frame.

### **BCA- 208 Internet Programming Lab and Mini Project**

1. Create a form in html to registration for membership on website(only HTML).
2. Change the look of the form created in question 1 by using CSS.
3. Implement validation in the form created in question 1 by using javascript.
4. Design your marksheet by using table tag.
5. Design 5 basic page website of your college.

### **BCA-209 Python Lab and Mini Project**

1. Design a Dice Rolling Simulator. When the program runs, it will randomly choose a number between 1 and 6. The program will print what that number is. It should then ask you if you'd like to roll again. For this project, you'll need to set the min and max number that your dice can produce. For the average die, that means a minimum of 1 and a maximum of 6. You'll also want a function that randomly grabs a number within that range and prints it.
2. Build Anagram finding program. Write a program that reads from a word-list file (a file of words) and tries to find all the anagrams of that word. Your goal is to find the largest list of words that are anagrams of each other from a provided word-list.
3. Generate Pascal's triangle. Write a program that asks for the height of Pascal's triangle from the user, then generate the Pascal's triangle.
4. Create a hangman game (without the graphics of the hangman itself). Hangman is a popular word game. In this game, the player is given some number of blanks representing the name of a movie or an actor and he/she has to guess the name using at most K number of chances.
5. Write a program in Python to encode and decode strings using a Caesar cipher. Caesar (rotation) cipher is one of the simplest, plain-text ciphers, known since at least the time of Julius Caesar. It takes in a plain-text string, and translates it into a new string based on a rotation of the alphabet being used. The basis is a "rotation", a re-sequencing of an alphabet.

### **BCA-209 C# Lab and Mini Project**

1. Write a program in C# Sharp to count a total number of alphabets, digits and special characters in a string.
2. Write a program in C# Sharp to count a total number of duplicate elements in an array.
3. Design program to implement Stack in c#.
4. Write a constructor destructor program in which you make 3 constructors. One is for default constructors with default message, next is parameterized constructor which accept a stringvalue and last one is also parameterized constructor which accept two numerical value and shows add of them. Initialize all constructors and shows output.
5. Write a program using Virtual and Override keyword that does the following tasks.

A virtual function Engine() that has basic properties of engine like Power of engine, RPM, no of Cylinder etc. This function should be overridden in child class according to function.

### **Teaching and Examination scheme for Bachelor in Computer Application Part-III Exam. – 2020**

Duration: 3 Hours

MM: 70

### **BCA-301 Software Engineering**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

#### **Unit I**

**Software Engineering:** Software, **Software Process**, Process Characteristics, Software Process Model- Linear Sequential Model, Prototyping Model, Spiral Model. **Software Quality**, McCall's Quality Factors. **Software Requirement Analysis and Specification (SRS):** Need, Characteristics and Components.

#### **Unit II**

**Cost Estimation:** COCOMO Model, **Designing Concepts:**Design Principles, Module level concepts- Cohesion and Coupling, Design notations and specifications, Verification, Metrics.

### Unit III

**Object Oriented Design:** Concepts, Design Notation and Specification, Design methodology, metrics. **Debugging Process:** Information Gathering, Fault Isolation, Fault Confirmation, Documentation, Fixing fault isolation.

### Unit IV

**Testing:** Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha And Beta Testing, Testing Object Oriented Programs, Testing Process: Comparison of Different Testing, Level of Testing. Project management for special classes of software projects: Using CASE tools, CBSE.

### Unit – V

**UML:** An overview of UML- UML notations, UML Class diagrams- association, multiplicity, generalization, aggregation, interfaces.

#### Reference:

1. Software Engineering: A Practitioner's Approach by Roger S. Pressman(McGraw Hill)
2. An Integrated Approach to Software Engineering By PankajJalote, (Narosa Publishing House)
3. Object-Oriented SoftwareEngineering: Practical Software Development using UML and Java By Timothy C. Lethbridge, Robert Laganière (McGraw Hill)
4. Object-Oriented Software EngineeringUsing UML, Patterns, and Java By Bernd Bruegg& Allen H. Dutoit(Prentice Hall)

Duration: 3 Hours

MM: 70

### BCA-302 Data Structure

#### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

#### Unit I

Primitive and Composite Data Types, Time and Space Complexity of Algorithms, Stack and Primitive Operation on Stack.Applications- Infix, Postfix, Prefix and Recursion. Queues, Primitive Operations on Queues, Circular Queue, De Queue and Priority Queue.

#### Unit II

Basic Operation on Linked List, Circular Linked List, Doubly Linked List, Linked Representation of Stack and Queue, Application of Linked List.

### Unit III

Trees: Basic Terminology, Binary Trees, Tree Representation as Array and Linked List, Basic Operation on Binary Tree, Traversal of Binary Tree – In Order, Preorder, Post Order, Application of Binary Tree, Threaded Binary Tree, B-Tree and Height Balance Tree.

### Unit IV

Sequential Search, Binary Search, Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Comparison of Sorting Methods.

### Unit V

Hash Table, Collision Resolution Techniques. Introduction to Graphs, Definition, Terminology, Directed, Undirected, Weighted Graph, Representation of Graphs, Graph Traversal – Depth First and Breadth First, Spanning Trees, Minimum Spanning Trees, Shortest Path Algorithm.

#### Suggested Readings -

1. Expert Data Structure with 'C' By R.B Patel (Khana Book Publishing Co.(P))
2. Data structure By Lipschutz (Tata McGraw Hill)
3. Data Structure By YashvantKanitkar (BPB)
4. An Introduction to Data Structures with Applications, By Jean-Paul tremblay, Paul G.Sarerson (Tata McGraw Hill)
5. Data Structure Using C and C++ By Yedidyahlangsam, Moshe J.Augenstein, Arora M. Tenenbaum (Prentice- Hall India)

Duration: 3 Hours

MM: 70

### BCA-303 PHP

#### 2. Instructions to Paper Setters

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consists of ten compulsory questions of 1 mark each(Two questions from each unit). Section B will consists of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The worl limit of part A, B and C are 50, 200 and 500 marks.

### Unit - I

**PHP:** Versions of PHP, Installation of PHP, Php.ini basics. Testing Installation. **Building Blocks of PHP:** Variables, data types, Operators & Expressions, Constants, Switching, Flow, Loops, Code Blocks and Browser Output.

### Unit - II

**Functions:** Meaning, Calling, Defining a function. Return value from user defined function. Saving state with 'static' function. **Arrays:** Creating



arrays, Array related functions. **Working with String, Date & Time:** Formatting String with PHP, Using Date and time Functions with PHP.

### Unit - III

**Forms:** Creating simple input Form. Accessing Form input with user defined arrays, HTML and PHP Code on a single page. Redirecting User. Working with File Upload. Uploading & Downloading.

### Unit- IV

**State management:** Using query string(URL rewriting), Using Hidden field, Using cookies, Using session. **String matching with regular expression:** What is regular expression, Pattern matching in Php, Replacing text, Splitting a string with a Regular Expression. **Email:** Sending Email, Headers, Reviewing SMTP, PHP Mailer, Building Notifications

### Unit - V

**Connecting to the MYSQL:** Selecting a database, Adding data to a table, Displaying returned data on Web pages, Inserting data, Deleting data, Entering and updating data, Executing multiple queries.

#### **Suggested readings -**

2. Deitel, Deitel and Nieto : Internet & WWW. How to program, 2<sup>nd</sup> Edition, Pearson Education Asia.
3. Teach Yourself PHP, MYSQL & Apache By Meloni, Pearson Education.
4. Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl & PHP By James Lee, Pearson Education.
5. PHP: A Beginner's Guide By Vaswani, Vikram Tata Mc-Graw Hill.

Duration: 3 Hours

MM: 70

### **BCA-304(A) Search Engine Optimization**

#### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### Unit – I

**Basics for SEO:** What is Domain, Basic Knowledge of World Wide Web, Difference between Portal and Search Engines, What is SEO, Types of SEO Techniques, Black hat techniques, White Hat techniques, How Search Engine works.

### Unit - II

**SEO Research & Analysis:** Market Research, Keyword Research and Analysis, Keyword opportunity, Competitors Website Analysis, SWOT Analysis of Website, How to Choose Best Keywords, Tools available for Keyword Research. **Website Design SEO Guidelines:** Content Research, Content Guidelines, Content Optimization, Design & Layout, XML Sitemap / URL List Sitemap.

### Unit - III

**On-page Optimization:** The Page Title, Meta Descriptions & Meta Keywords, Headings, Bold Text, Domain Names & Suggestions, Canonical Tag, Meta Tags, Images and Alt Text, Internal Link Building, The Sitemap, Invisible Text, Server and Hosting Check, Robots Meta Tag, Doorway Pages, 301 Redirects, 404 Error, Duplicate content.

### Unit - IV

**Off-page Optimization:** Page Rank, Link Popularity, Link Building in Detail, Directory Submission, Social Bookmark Submission, Blog Submission, Articles, Links Exchange, Reciprocal Linking, Posting to Forums, Submission to Search Engine, RSS Feeds Submissions, Press Release Submissions, Forum Link Building, Competitor Link Analysis.

### Unit - V

**Analytics:** Google Analytics, Installing Google Analytics, How to Study Google Analytics, Interpreting Bars & Figures, How Google Analytics can Help SEO, Advanced Reporting, Webmaster Central & Bing/Yahoo, Open Site Explorer, Website Analysis using various SEO Tools available.

**SEO Tools:** Keyword Density Analyzer Tools, Google Tools, Yahoo / Bing Tools, Rich Snippet Text Tools, Comparison Tools, Link Popularity Tools, Search Engines Tools, Site Tools, Miscellaneous Tools. **SEO Reporting:** Google analysis, Tracking and Reporting, Reports Submission, Securing Ranks

#### **Suggested readings -**

- ◆ The Art of SEO (Theory in Practice) - Eric Enge, Stephen Spencer, Jessie Stricchiola, and Rand Fishkin (O'REILLY)
- ◆ Search Engine Optimization All-in-One For Dummies by Bruce Clay
- ◆ SEO Step-by-Step by Caimin Jones

Duration: 3 Hours

MM: 70

## **BCA-304(B) Android Programming**

### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any

three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### **Unit -I**

java ( Exception handling & Packages & interfaces & JVM & .jar file extension & Multi threading. Database(DML&DDL) , What is Android & Setting up development environment & various editors.

### **Unit -II**

Application Structure ( AndroidManifest.xml , uses-permission & uses-sdk , Resources & R.java , Assets & Layouts & Drawable Resources , Activities and Activity lifecycle.

### **Unit -III**

Eclipse editor :(Menu , Option menu , Context menu , Sub menu , menu from xml , menu by code). SQLite Programming , SQLiteOpenHelper , SQLiteDatabase.

### **Unit -IV**

Adapters and Widgets ( Adapters:- a. ArrayAdapter b. BaseAdapters , ListView and ListActivity , Custom listview , GridView using adapters , Gallery using adapters).

### **Unit -V**

Notifications ( Broadcast Receivers , Services and notifications , Toast , Alarms). Advanced Live Folders ( Using sdcards , XML Parsing , JSON Parsing , Maps, GPS, Location based Services, Accessing Phone services :(Call, SMS, MMS)).

### **Suggested Readings**

- ◆ Android Programming for Beginners by John Horton Publisher: Packt Publishing
- ◆ Learn Java for Android Development (2nd edition) by Jeff Friesen Publisher: Apress
- ◆ Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.
- ◆ Beginning Android Programming with Android Studio, Fourth Edition by Jerome F. DiMarzio Publisher: John Wiley & Sons
- ◆ Android Programming: The Big Nerd Ranch Guide by Kristin Marsicano , Chris Stewart , Bill Phillips Publisher: Big Nerd Ranch Guides.

Duration: 3 Hours

MM: 70

## **BCA-305 (A) Cyber Security**

### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five

questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### **Unit I**

Cyber Security: definition, cybercrime and information security, cybercriminals, classification of cybercrime, cybercrime Era. Cyber offences: categories of cybercrime, how criminals plan the attack, cyberstalking, cybercafe and cybercrime, botnets and cybercrime, Cloud Computing and cybercrime.

### **Unit II**

Tools and methods used in cybercrime: phishing and Identity theft; methods of phishing, spear phishing, types of phishing scams, phishing toolkits, and spy phishing, Personally Identifiable Information, types and techniques of ID theft, password cracking, keyloggers and spywares, backdoors, steganography, DoS and DoS attacks, SQL Injection, Buffer Overflow.

### **Unit III**

Cybercrime on mobile and wireless devices: Security challenges posed by mobile devices, attacks on wireless networks, credit card frauds mobile and wireless era. Authentication security service, attacks on mobile phones; mobile phone theft, mobile virus, mishing, vishing, smishing, hacking Bluetooth.

### **Unit IV**

Cybercrime and Cyber Security: Cyber Law, The Indian IT Act, Digital Signatures and IT Act, Cyber security and organizational implications, Cyber crisis management, Anti- Cybercrime Strategies, Cybercrime and Cyberterrorism. cybercrime and Indian ITA 2000.

### **Unit V**

Computer forensics: introduction, computer forensics and digital evidence, digital forensics life cycle, computer forensics and steganography, Relevance of the OSI 7 Layer model to computer forensics, Anti forensics.

### **Suggested Readings :**

1. Cyber Security by Nina Godbole & sunit Belapure
2. Computer Forensics by Marie- Helen Maras

Duration: 3 Hours

**MM: 70**

### **BCA-305 (B) Internet of Things**

### **2. Instructions to Paper Setters**

The syllabus is divided into five units. The question paper will consist of A, B and C sections. Section A will consist of ten compulsory questions of 1 mark each (Two questions from each unit). Section B will consist

of ten questions (two questions from each unit) and students are required to attempt five questions (3 marks each). Section C will consist of five questions (1 from each unit) and students are required to attempt any three questions (15 marks each). The word limit of part A, B and C are 50, 200 and 500 marks.

### **Unit I**

Introduction: Definition Characteristics, Architecture, Logical Design, protocols. Types of IOTs. M2M and IOT: Difference, SDN and NFV for IOT.

### **Unit II**

IOT System Management: Need, SNMP, Requirements. IOT platform design methodology. IOT logical design

### **Unit III**

IOT Devices: Building blocks, exemplary device: Raspberry PI Interfaces. Other IOT devices. Introduction to WAMP, Django, SkyNet

### **Unit IV**

Introduction to Apache Hadoop, Map reduce programming model, Hadoop Yarn, Apache Oozie, Apache Spark, Apache Storm

### **Unit V**

Tools for IOT: Chef, Puppet, NETCONF-YANG, IOT code generator

### **Suggested Readings:**

1. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally
2. Internet of Things (A Hands-on-Approach) , Vijay Madiseti , Arshdeep Bahga
3. From Machine-to-Machine to the Internet of Things : Introduction to a New Age of Intelligence by Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis Karnouskos, Stefan Avesand, David Boyle, Academic Press, 2014
4. Rethinking of Internet of Things by Francis daCosta, Apress
5. Adrian McEwen, "Designing the Internet of Things", Wiley Publishers, 2013

### **BCA-306 PROJECT(based on a Case Study)**

#### **Practical Training and Project Work:**

1. Project Work may be done individually or in groups (Maximum Three) in case of bigger projects. However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.

3. The Student must submit a synopsis of the project report to the college for approval. The Project guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.

**4. The project report should be hand written.**

**Submission Copy:**

The Student should submit spiral bound copy of the project report.

**Format of the Project:**

**(a) Paper:**

The Report shall be typed on White Paper of A4 size.

**(b) Final Submission:**

The Report to be submitted must be original.

**(c) Typing:**

**Font** :- Times New Roman

**Heading** :- 16 pt., Bold

**Subheading** :- 14 pt, Bold

**Content** :- 12 pt.

**Line Spacing** :- 1.5 line.

**Typing Side** :- One Side

**Font Color** :- Black.

**(d) Margins:**

The typing must be done in the following margin:

**Left** : 0.75"

**Right** : 0.75"

**Top** : 1"

**Bottom** : 1"

**Left Gutter** : 0.5"

**(e) Binding:**

The report shall be Spiral Bound.

**(f) Title Cover:**

The Title cover should contain the following details:

**Top:** Project Title in block capitals of 16pt.

**Centre:** Name of project developer's and Guide name.

**Bottom:** Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

**(g) Blank sheets:**

At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

**(h) Content:**

I). Acknowledgement

II). Institute/College/Organization certificate where the project is being developed.

- III). Table of contents
- IV). A brief overview of project
- V). Profiles of problem assigned
- VI). Study of Existing System
- VII). System Requirement
- VIII). Project plan
  - o Team Structure
  - o Development Schedule
  - o Programming language and Development Tools
- IX). Requirement Specification
- X). Design
  - o Detailed DFD's and Structure Diagram
  - o Data structure, Database and File Specification
- X). Project Legacy
  - o Current Status of project
  - o Remaining Areas of concern
  - o Technical and Managerial Lessons Learnt
  - o Future Recommendations
- XI). Nomenclature and Abbreviations.
- XII). Bibliography
- XIII). Source Code.