Revised syllabus of BCA course (BCA4)
BCA II year syllabus

Subject Code	Subject Title	Teaching Scheme Hrs/week		Examination			
				Exam. Duration (Hrs)	Marks		
		Theory	Practical		Theory/ Practical	IA	Total
BCA III Semester (w.e.f. 2018-19 and onwards)							
17BCAMILT31	Modern Indian Language	4	--	3	80	20	100
17BCADMST32	Discrete Mathematical Structures	4	--	3	80	20	100
17BCAOOPT33	Object Oriented Programming Using Java	4	--	3	80	20	100
17BCAOSPT34	Operating System Principles	4	--	3	80	20	100
17BCARDCM35	Data Communications & Computer Networks	4	--	3	80	20	100
17BCACPPP36	Java programming Lab	--	4	3	80	20	100
17BCAOSPP37	Linux/UNIX Lab.	--	4	3	80	20	100
BCA IV Semester (w.e.f. 2018-19 and onwards)							
17BCAMILT41	Modern Indian Language	4	--	3	80	20	100
17BCADAAT42	Design and Analysis of Algorithms	4	--	3	80	20	100
17BCACNST43	Advanced Computer Networks and Security	4	--	3	80	20	100
17BCAAJAT44	Advanced Java Programming	4	--	3	80	20	100
17BCADBMT45	Database Management System	4	--	3	80	20	100
17BCAJANP46	Advanced Java and Networks Lab.	--	4	3	80	20	100
17BCADBMP47	Database Management System Lab.	--	4	3	80	20	100

Additional English

Detailed Syllabus for B. Sc. / B.Sc. Comp-Sc / BCA / B. Sc. in CCJ
(With effect from 2017-18 onwards)
Semester III: Additional English
Teaching Hours: 5 Hours per Week

Text: *Final Solutions*: A Play by Mahesh Dattani (Penguin Books)

Grammar and Composition

1. Determiners (Some/any/no/none/any/much/many/little/few/a lot/plenty/all/all of/ most/most of//all/every/whole /each/every etc.)
2. Adjectives and adverbs (making Sentences using adj and adv)
3. Futurity in English
4. Phrasal Verbs (Making sentences using phrasal verbs)
5. Concord

Pattern of Question Paper

(80 Marks per paper of three hours and 20 Marks for I.A)

1) Objective type questions on the play	10X1= 10
2) Comprehension Questions on the play	5X2=10
3) Essay type question on the play (one out of two)	1X10 =10
4) Essay type question on the play (one out of two)	1X10=10
5) Short Notes on the play (two out of four)	2X5=10
6) a) Determiners	5X1=05
b) Use of Adjectives and Adverbs making sentences using adjectives and adverbs given (5 out of 7)	5X1=05
7) Futurity in English	10
8) a) Phrasal Verbs making sentences using Phrasal Verbs (5 out of 7)	5X1=05
b) Concord	5X1=05
	80

Syllabus for B.Sc./B.C.A - III & IV Semesters from the academic year 2017-18 onwards

B.Sc. III rd Semester

Basic: Hindi

1) Examination : a) One Paper carrying 80 Marks and 3 hours of Duration.

b) Internal Assessment Marks 20

2) Teaching : 5 hours per week

1. Course :1) Drama

Translation – From Kannada/English in to Hindi 4)Distribution of Marks

I	Objective type of Questions 10/14	10 Marks
II	Annotations from Drama 2/4	10 Marks
III	General questions based on Drama2/4	30 Marks
IV	Short Notes on Drama 3/5	15 Marks
V	Translation	15 Marks
	Total	80 Marks
	Internal Assessment	20 Marks
	Total	100 Marks

Text Books -

3. **Drama (नाटक)**

आधेअधूरे: मोहन राके श Marks: 65

राधाकृ ण काशण ाइवेट ल मटेड

७/३१ अ सार माग, द रयागंज,नई द -ल११०००२

2) Translation (अनुवाद) Marks: 15

Reference Books

1. मो नराके शऔर उनका सा ह :यडाँनीलम फा खी
2. ह दनाटक :ब चन संह
3. मो नराके शऔर उनके नाटक : गर रश तो ग
4. वातं यो नाटकतर : मू संय मण: योती वर म
1. भारतीय ना य– वमश: जयदेवतनेजा
6. ह दनाटक और ना यसमी : डॉ. नारायण राय
7. ह दके मुखनाटककार के नाटको म लोकत व: स यवीर संहभो रया
8. अनुवाद व ान: भोलानाथ तवार
9. अनुवादक , तकनीकया और सम याएँ: ीनारायण समीर

Basic - Kannada

ಸಾಹಿತ್ಯ ಸಿಂಚನ–೩

ಬಿ.ಸಿ.ಎ., ಬಿ.ಬಿ.ಎ., ಬಿ.ಎಸ್‌ಸಿ. (ಕಂಪ್ಯೂಟರ್ ಸೈನ್ಸ್) ತರಗತಿಗಳಿಗೆ ಮೂರನೆಯ ಸೆಮಿಸ್ಟರ್
ಆವಶ್ಯಕ ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ

ಪದ್ಯಭಾಗ

೧.	ಸಾರಥಿಯಾಗು ನಡೆ	–ಕುಮಾರವ್ಯಾಸ
೨.	ಎಲ್ಲರು ಮಾಡುವುದು ಹೊಟ್ಟೆಗಾಗಿ	–ಕನಕದಾಸ
೩.	ಸಿರಿಯು ಕನಸಿನಂತೆ	–ಮುಪ್ಪಿನ ಷಡಕ್ಷರಿ
೪.	ಓ, ಬನ್ನಿ, ಸೋದರರೆ, ಬೇಗ ಬನ್ನಿ!	–ಕುವೆಂಪು
೫.	ಎಲ್ಲಿಯ ಜಾತಿ ಎಲ್ಲಿಯ ಪಕ್ಷ	–ಭುಜೇಂದ್ರ ಮಹೀಶವಾಡಿ
೬.	ತುಳಸೀ ಕಟ್ಟೆ	–ಬಿ. ಎ. ಸನದಿ
೭.	ಬಿದಿರು ಬಾಲೆ	–ಎಲ್. ಹನುಂತಯ್ಯ
೮.	ಅಕ್ಕ–ತಂಗಿ, ಗೆಳತಿ	–ಜಾನಪದ ಸಂವಾದ

ಗದ್ಯಭಾಗ

೯.	ದುಷ್ಟಬುದ್ಧಿಯುಂ ಧರ್ಮಬುದ್ಧಿಯುಂ	–ದುರ್ಗಸಿಂಹ
೧೦.	ಸತ್ಯಶೋಧನೆ	–ಶ್ರೀ ಸಿದ್ಧೇಶ್ವರ ಸ್ವಾಮಿಗಳು
೧೧.	ಪ್ರಾಮಾಣಿಕತೆ	–ಸಾರಾ ಅಬೂಬಕ್ಕರ್
೧೨.	ಮೂರು ಗಂಟೆಗಳು	–ಅ. ರಾ. ಮಿತ್ರ
೧೩.	ದಾರಿಗಳು	–ಅಮರೇಶ ನುಗಡೋಣಿ
೧೪.	ಒಪ್ಪಂದದ ಮದುವೆ	–ಡಾ. ಲತಾ ಗುತ್ತಿ
೧೫.	ಒಂದು ಫೋಟೋದ ನೆಗೆಟಿವ್	–ಶ್ರೀಧರ ಬಳಿಗಾರ
೧೬.	ಹೂಗಳ ಲೋಕ	–ಮಲ್ಲಿಕಾರ್ಜುನ ಹುಲಗಬಾಳಿ

(ಡಾ. ಎಸ್. ಎಂ. ಗಂಗಾಧರಯ್ಯ)
ಅಧ್ಯಕ್ಷರು
ಕನ್ನಡ ಅಭ್ಯಾಸ ಮಂಡಳಿ (ಯು.ಜಿ)

Syllabus prescribed for B.Sc is applicable to B.C.A and B.Sc C.S.

B.Sc

Semester III

Basic Marathi

Course: Literary Form: Novel

Text: Banagarwadi : Vyankatesh Madagulkar

Mehata Publication, Pune

Bsc Part –II Basic – Samskrit **Third Semester**			
Teaching Hours	:	5 Hours per week	
Exam Marks	:	80+20=100 of 3 hours Duration	
Text : xÉÑlÉÏÌiÉ xÉÑkÉÉìlÉÍkÉÈ (112 Verses)Mahatee Publication Dharwad – 1			
1.	(lÉmÉÑÇxÉMüvÉoSÉÈ)	:	70 Marks
2.	Grammer	:	10 Marks
3.	Internal Assessment 1. Internal Test – 14 2. Assignment, Class Records Skill –	:	20 Marks
	Development – 06 **Total**		**100 Marks**

Bsc Part –II
Basic – Samskrit
Question Paper Pattern
Third Semester

1.	Select the correct answer (any ten out of twelve)	10 Marks
2.	Translate & explain (any three out of six)	15 Marks
3.	Explain with reference to context (any four out of six)	16 Marks
4.	Essay type question (with internal choice)	14 Marks
5.	Short notes (any three out of five)	15 Marks
6.	Grammar (Neuter genders)	10 Marks
	Total	**80 Marks**

RANI CHANNAMMA UNIVERSITY, BELAGAVI

17BCADMST32:Discrete Mathematical Structures

Teaching Hours: 4 Hrs/week **Marks: Main Exam: 80**
IA: 20

UNIT I 10Hrs

Mathematical Logic: Statements and notations, connectives, well-formed formulas, tautologies, equivalence of formulas, Duality law, Tautological Implications, other connectives, Rules of inference, consistency of premises and methods of proof, Predicates, the statement function, variables and quantifiers, predicate formula, free and bound variables.

UNIT II 10Hrs

Set Theory: Definition of Sets, Venn Diagrams, complements, Cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), proofs of some general identities on sets, pigeonhole principle. Pigeon hole principle. Relations: Definition, properties of binary relations in a set, Relation matrix and Graph of a relation, Partition and covering of set, equivalence relations.

UNIT III 08Hrs

Algebraic Systems: Binary composition and its properties definition of algebraic structure; Groyas Semi group, Monoid Groups, Abelian Group, properties of groups, Permutation Groups, Sub Group, Cyclic Group, Rings and Fields (definition and standard results).

UNIT IV 12Hrs

Combinatorics: Mathematical induction, recursive mathematical definitions, Basics of counting, Combinations and permutations, Enumerating Combinations and permutations with repetitions,

Multinomial theorems, the principles of Inclusion – Exclusion. Recurrence relations (nth order recurrence relation with constant coefficients, Homogeneous recurrence relations, Inhomogeneous recurrence relation)

UNIT V 10Hrs

Graph Theory: Basic concepts: Graph, Directed Graph, Multi Graph, Degree of vertex and their properties, Adjacency Matrix, Cycle Graph, Bipartite graphs, Isomorphism and Subgraphs, Trees and their properties.

References:

1. Tremblay J. P. and Manohar R., Discrete Mathematical Structures with applications to Computer Science, Tata Mc Graw Hill Publishing Co., 35th edition, 2008
2. J.L. Mott, A. Kandel, T.P. Baker, Discrete Maths for Computer Scientists & Mathematicians, Second Edition, Prentice Hall of India Pvt Limited, New Delhi, 2009
3. C L Liu, D P Mohapatra, Elements of Discrete Mathematics - A computer Oriented Approach, Third Edition, Tata McGraw Hill
4. Kolman and Busby, Discrete Mathematical Structures for Computer Science, Prentice Hall

Additional Reading:

5. Alan Doerr and Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications (P) Ltd
6. V. Sundaresan, K.S. Ganapathy Subramanian and K. Ganesan, Discrete Mathematics, A. R. Publications
7. Kenneth H.Rosen, Discrete Mathematics and its Application, Fifth edition, Tata McGraw-Hill Publishing company PVT .Ltd., New Delhi

17BCAOOPT33:Object Oriented Programming Using Java
Teaching Hours: 4 Hrs/week Marks: Main Exam: 80
IA: 20

UNITI 10Hrs

Fundamentals of Object Oriented Programming(OOP), difference between Procedural and Object oriented programming , basic OOP concept - Object, classes, abstraction, encapsulation, inheritance, polymorphism

.History of Java, features of Java, JDK Environment, Java Virtual Machine, Java Runtime environment, Identifiers and Keywords, Data types and typecasting, Variables, Java coding conventions, Expressions, Control structures, Decision making statements, Arrays and its methods, command line arguments.

UNIT II 08Hrs

Java classes, Define class with instance variables and methods, Object creation, Accessing member of class, argument passing, Constructors, Method overloading, Static data, Static methods, Static blocks, This keyword, Garbage collection & finalize() method, Nested & Inner classes, Wrapper Classes, String (String Arrays, String Methods, String Buffer, String Builder)

UNIT III 10Hrs

Inheritance: Super class & subclass, abstract method and classes, method overriding, final keyword, super keyword, dynamic method dispatch. Packages and Interfaces: Importing classes, user defined packages, modifiers & access control (Default, public, private and protected), implementing interfaces, user defined interfaces; Exploring java.util package: Vector, Scanner, Date, Calendar.

UNIT IV 12Hrs

Exception handling: Types of Exceptions, try, catch, finally, throw, throws keywords, creating your own exception, nested try blocks, multiple catch statements, user defined exceptions. Java Input Output: Java IO package, File, Class Byte/Character Stream, Buffered reader / writer, File reader / writer, PrintWriter; Multithreading: Multithreading concept, Java thread model, Main thread, Creating a thread, Creating multiple threads, Using isAlive() and join(), Thread priorities, Synchronization, Inter-thread communication, Suspending, Resuming and Stopping threads.

UNIT V 10Hrs

Applets: How Applets differ from Applications, Preparing to write applet, Building applet code, Applet life cycle, Creating an executable applet, Applet tags, Adding applet to HTML file, Getting input from the user. Graphics: The graphics class, Lines and rectangles, Circles and ellipses, Drawing arcs, Drawing polygons, Line graphs, Drawing bar charts.

References:

1. Herbert Schildt, The Java 2 : Complete Reference, Fourth edition, TMH,
2. Balaguruswamy, Programming with JAVA A primer, 4th Edition, TATA McGraw-Hill
3. Cay S Horstmann, Fary Cornell, Core Java 2, Volume – I, Sun Microsystems Press
4. https://docs.oracle.com/javase/tutorial/

Additional Reading:

5. Peter Van der Liden, Just Java, Prentice Hall
6. H. M. Deitel, P. J. Deitel, Java: how to program, 5th edition, Prentice Hall of India
7. Y. Daniel Liang, Introduction to Java programming, 9thEdition, Pearson education

RANI CHANNAMMA UNIVERSITY, BELAGAVI

17BCAOSPT34: Operating System Principles	
Teaching Hours: 4 Hrs/week	Marks: Main Exam: 80 IA: 20

UNIT I **10Hrs**

Introduction: Basics of Operating Systems: Definition, types of Operating Systems, OS Services, System Calls, OS structure: Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine.

UNIT II **10Hrs**

Process Management Process Definition, Process states , Process State transitions , Process Control Block , Context switching , Threads, Concept of multithreads, Benefits of threads, Types of threads. Process Scheduling: Definition, Scheduling objectives, Types of Schedulers, CPU scheduling algorithms, performance evaluation of the scheduling.

UNIT III **10Hrs**

Inter-process Communication Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, and Classical IPC Problems. Deadlocks: Definition, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance (concepts only).

UNIT IV **10Hrs**

Memory Management: Logical and Physical address map, Memory allocation, Internal and External fragmentation and Compaction, Paging. Virtual Memory: Demand paging, Page Replacement algorithms, Allocation of frames, Thrashing.

UNIT V **10Hrs**

I/O Management- Principles of I/O Hardware: Disk structure, Disk scheduling algorithms File Management: Access methods, File types, File operation, Directory structure, File System structure, Allocation methods, Free-space management, and directory implementation.

References:

1. Silberschatz, Peter B. Galvin and Greg Gagne, Operating System Concepts, 9th Edition, WileyIndian Edition
2. Andrew S Tanenbaum, Modern Operating Systems, Third Edition, Prentice Hall India
3. Sumitabha Das, UNIX Concepts and Applications,4th Edition, Tata McGraw Hill

Additional Reading:

4. Milankovic, Operating Systems, Tata McGraw Hill
5. Naresh Chauhan, Principles of Operating Systems, Oxford Press
6. D.M. Dhamdhere, Operating Systems: A concept based approach, 2nd edition, Tata McGraw Hill

RANI CHANNAMMA UNIVERSITY, BELAGAVI

17BCADCMT35: Data Communications and Computer Networks

Teaching Hours: 4 Hrs/week **Marks: Main Exam: 80 IA:20**

UNIT I **08Hrs**

Introduction: Communication Networks and Services; Approaches to Network Design-.Network Functions and topology; Telegraph Network and Message Switching, Telephone Networks and Circuit Switching, Internet and Packet Switching; Key Factors in Communication Network Evolution; Layered Architecture and an Applications-Examples of Layering, OSI and TCP/IP reference Models.

UNIT II **08Hrs**

Digital Transmission: Digital representation of information; Properties of digital transmission-Characterization of Communication Channels, Frequency Domain and Time domain; Fundamental limits in Digital Communication – Nyquist signaling rate and Shannon Channel capacity, Line Coding; Modems and digital modulation

UNIT III **10Hrs**

Transmission systems: Properties of Media and Digital transmission systems – Twisted pair, Coaxial cable, Optical Fibre, Radio Transmissison, Microwave Transmission, Infrared Light; Error Detection and Correction – single Parity check, Two Dimensional Parity Check, Polynomial Codes, Internet Checksum, Hamming Code; Multiplexing-Frequency division Multiplexing, Time Division Multiplexing, Wavelength Division Multiplexing; Circuit Switches-Space Division Switch, Time Division Switch.

UNIT IV **12Hrs**

Peer-to-Peer Protocols: Peer-to-Peer protocols and Service Models; ARQ Protocols- Stop-and-Wait ARQ, Go-back –N ARQ, Selective Repeat ARQ; Other adaptation Functions – Sliding Window Flow Control, Timing Recovery in Synchronous services, Reliable Stream Services, Data link Controls – HDLC, PPP .

UNIT V **12Hrs**

Local Area Networks and Medium Access Control – Multiple Access Communications; Local Area Networks- LAN Structure, MAC Sublayer, Logical Link Control Sublayer; Random Access Protocols- ALOHA, Slotted ALOHA, CSMA, CSMA/CD; Scheduling Approaches to Medium access control – Reservation Systems, Polling, Token Passing Rings; Channelization – FDMA, TDMA,CDMA; LAN Standards- IEEE 802.3 (Ethernet), IEEE 802.11(Wireless LAN), LAN Bridges

References:

1. Communication Networks, Fundamental Concepts and key Architecture, Leon- Garcia, Widjaja, Tata Mcgraw-Hill Publication
2. Behrouza A Forouzan, Data Communication & Networking, Tata McGraw Hill
3. Andrew S. Tanenbaum, Computer Networks, 5th Ed, Pearson Education
4. William Stallings, Data and Computer Communications, 7th Edition, PHI
5. http://highered.mheducation.com/sites/0072967757/index.html

Additional Reading:

6. Proakin, Digital Communications, Mc Graw Hill
7. Brijendrasingh, Data Communication and Computer Networks, PHI
8. Dr. Prasad, Data Communication & Network, Wiley,Dreamtech

RANI CHANNAMMA UNIVERSITY, BELAGAVI

17BCACPPT36: Java programming Lab.	
Practical Hours: 4 Hrs/week	Marks: Main Exam: 80 IA:20

Students are encouraged to use Linux-Open Source OS for executing java –programs using javac compiler available in Linux.

Journal Programs

1 Write a Java program to find factorial of a number reading input as command line argument.
2. Write a Java program to demonstrate method overloading.
3. Write a java program to demonstrate atleast 5 string methods using Scanner class.
4. Write a Java program to demonstrate static variables, methods and blocks.
5. Program to copy bytes from one file to another.
6. Write a Java program that creates an object and initializes its data members using constructor. Use constructor overloading concept.
7. Write a Java Program to implement Wrapper classes and their methods.
8. Program to demonstrate multilevel inheritance. Show the usage of super ().
9. Write a Java Program to implement inheritance and demonstrate use of method overriding.
10. Write a program to demonstrate use of user defined package by importing the package and access the member variable of classes contained in the package.
11. Write a program to demonstrate use of implementing interfaces.
12. Write a java program to implement exception handling using multiple catch statements. Also include code to identify the significance of finally block in handling exceptions.
13. Illustrate creation of thread by
a)Extending Thread class.b) Implementing Runnable interface
14. Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.
15. Write a program to create student report using applet, read the input using text boxes and generate the grades.

Practice Programs

1. Write a Java Program to implement Vector class and its methods.
2.Write a Java program to perform matrix multiplication.
3.Write a Java program to find GCD and LCM of two numbers (GCD is calculated using Euclidean Algorithm. LCM is found using factorization method.).
4.Write a Java program implement basic queue operations.
5.Write a Java program to count the frequency of words, characters in the given line of text.
6.Illustrate thread join concept.
7.Write a program to implement the concept of Exception Handling by creating user defined exceptions.

Note: For practical examination the combinations shall be:

Program 1: Any program from 1 to 8
Program 2: Any program from 9 to 15

RANI CHANNAMMA UNIVERSITY, BELAGAVI

17BCAOSPP37: Linux/UNIX Lab.

Practical Hours: 4 Hrs/week **Marks: Main exam: 80**
IA: 20

Revisit: Understands shell concept in UNIX/Linux environment and practice basic commands of Linux/UNIX. Study of Advance commands and filters of Linux and using vi editor for writing shell scripts

Study Basics of shell programming-read command, expr, Using Command Line Arguments, Logical Operators && and ||, conditional Branching- if, case, test and [ ] to evaluate the expression, looping, arrays.

Lab Assignments

1. Write a shell script to generate mark-sheet of a student by reading five subject marks, calculate and display total marks, percentage and Class obtained by the student.
2. Write a shell script that displays first n prime numbers as output.
3. Write a shell script to read n numbers as command arguments and sort them in descending order.
4. Write a shell script to display all executable files, directories and zero sized files from current directory.
5. Write a shell script to check entered string is palindrome or not.
6. Write a shell script to perform basic arithmetic operations(use case statement)
7. Write a shell script to determine whether a given file exists or not, file name is supplied as command line argument
8. Write a shell script to search and replace string in a file.
9. Write a shell script that accepts a word and a file name as its arguments, counts and reports the occurrence of given word in the given file.

Following shall be executed in Linux environment using gcc/similar compiler.

10. Write a C/Java program that implements a producer-consumer system with two processes.
11. Write a C/Java program to allow cooperating processes to lock a resource for exclusive use, using Semaphores
12. Write a C program to implement Round Robin CPU scheduling.
13. Write a C program to implement SJF CPU scheduling.
14. Write a C program to implement FCFS CPU scheduling.
15. Write a C program to implement Priority based CPU scheduling.
16. Write a C program to implement FIFO page replacement.
17. Write a C program to implement LRU scheduling.

Practice Programs:

6. Write a shell script to read a number and find the sum of digits.
7. Write a shell script to read 2 filenames and find which file has more number of words (lines/characters)
8. Find which file is older.
9. Read a directory name and find the number of subdirectories, text files and link files.
10. Read two distances in mtrs and display the sum in km:mt:cm format

Note: For practical examination the combinations shall be:

Program 1: Any program from 1 to 9
Program 2: Any program from 10 to 17