

**Department of Distance Education  
Punjabi University, Patiala**

**Syllabus  
BCA- Part-III  
(Annual)  
Session:- 2020-21**

<b>Paper Code</b>	<b>Title of Paper</b>	<b>University Examination</b>	<b>Internal Assessment</b>	<b>Max. Marks</b>	<b>Time Allowed</b>
BCA-301	General English (Communication Skills – III)	80	20	100	3 Hrs.
BCA-302	Java Programming	80	20	100	3 Hrs.
BCA-303	Internet Programming	80	20	100	3 Hrs.
BCA-304	Operating Systems	80	20	100	3 Hrs.
BCA-305	Software Engineering	80	20	100	3 Hrs.
BCA-306	Computer Oriented Numerical and Statistical Methods	80	20	100	3 Hrs.
BCA-307	Software Lab – V (Programming in Java)	50	-	50	3 Hrs.
BCA-308	Software Lab – VI (Internet Programming)	50	-	50	3 Hrs.
<b>Total</b>		<b>580</b>	<b>120</b>	<b>700</b>	

**NOTE: Internal Assessment:**

- i. 75% marks would be awarded as the basis of Internal test conducted during 2nd PCP.
- ii. 25% marks would be awarded as the basis of attendance of both PCP's.

**BCA-301: GENERAL ENGLISH (COMMUNICATION SKILLS – III)****BCA-301 : GENERAL ENGLISH (COMMUNICATION SKILLS)***Maximum Marks : 80**Maximum Time : 3 Hours**Min. Pass Marks : 35%***SECTION-A****TEXTS PRESCRIBED**1. *Arms and the Man* by Shaw\*2. *English Poetry - A Kaleidoscope*, University Press Distributed by Orient Longman\*

\*The following twenty poems are to be studied :

1. On His Blindness
2. The Village Schoolmaster
3. The Tiger
4. The Solitary Reaper
5. Kubla Khan
6. Waterloo
7. To a Skylark
8. La Belle Dame Sans Merci
9. The Lady of Shalott
10. The Last Ride Together
11. Dover Beach
12. Shelley's Skylark (by Hardy)
13. All Beauteous Things
14. Invictus
15. Listeners
16. Sea Fever
17. The Soldier
18. Do not go gentle into that good night
19. The Express
20. Night of the Scorpion

**SECTION-B**

Text prescribed for grammar and Figurative expressions :

1. W. Stannard Allen : *Living English Structure*, (Orient Longman)
2. Wilfred D. Best : *The Students Companion* (Rupa)

**TESTING**

- Q.1.(a) One essay type question with internal alternative on theme, incident, character or summary of the Act, plot structure of 200-250 words from *Arms and the Man*.  
10 Marks

- (b) Five short notes out of eight, each of 30 words from *Arms and the Man*.  
1×5=5 Marks
- (c) One passage out of two to be explained with reference to the context.  
5 Marks
- Q.2. (a) One essay type question with internal alternative on theme, central idea or summary of a poem from *English Poetry-A Kaleidoscope*. 10 Marks
- (b) One passage out of two to be explained with reference to the context from *English poetry*. 5 Marks
- Q.3. One essay of not fewer than 350 words out of four topics which can be imaginative, reflective, descriptive or current. 7 Marks
- Q.4. Making a precis of a passage of not fewer than 300 words with suitable title. 5 Marks
- Q.5. Translation from English into Punjabi/Hindi of one running passage consisting of eight sentences. 1×8 = 8 Marks

OR

Comprehension of an Unseen prose passage  
(For those who do not know Punjabi/Hindi)

- (a) Four questions to test the comprehension of the passage 1×4=4 Marks
- (b) Meanings of four words/phrases italicised in the passage and use of their in illustrative sentences.  $(\frac{1}{2}+\frac{1}{2})\times 4= 4$  Marks

### GRAMMAR

15 Marks

- Q.6. The prescribed text is W. Standard Allen : *Living English-Structure* (Orient Longman).

The students shall be examined on material included in exercise 47.1 to Exercise 58.4. This will carry 10 marks.

The students shall also be examined on the material already studied in B.C.A. Part-II (2.5 marks) and B.C.A. Part-I (2.5 marks). The division will be as follows :

- (a) Exercise 1.1 to Exercise 30.3 : 2½ Marks
- (b) Exercise 31.1 to Exercise 46.10 : 2½ Marks
- (c) Exercise 47.1 to Exercise 51.18 : 5 Marks
- (d) Exercise 52.1 to Exercise 58.4 : 5 Marks

The students shall be required to attempt 5 sentences out of 8 set in parts (a) & (b) each, 10 sentences out of 15 set in parts (c) & (d) each. The examiner shall be free to set direct questions from the prescribed text or otherwise, so long as each response expected of the student carries half a mark.

Figurative expressions and proverbs : 10 Marks

Q.7. The prescribed text is *Wilfred D. Best The Student's Companion* (Rupa). The student shall be examined on the following material.

(a) Figurative expressions and their explanation

7 Marks

(b) Proverbs

3 Marks

The examiner shall restrict himself to the prescribed text.

In part (A) the students shall be required to explain the meaning (half marks) and use in their own sentences (half marks) 7 figurative expressions out of 10 set. In part (B) the students shall be required to complete 6 out of 10 incomplete proverbs set; each carrying half a mark.

#### **IMPORTANT**

The examiner shall also give clear instructions to the candidates in the question paper asking them to attempt these questions only at one place and only once. Second or subsequent attempts, unless earlier attempts have been crossed out, shall not be evaluated.

### **BCA-302: JAVA PROGRAMMING**

**Maximum Marks : 80**

**Max. Time : 3 Hrs.**

**Min. Pass Marks : 35%**

#### **A) INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

#### **B) INSTRUCTIONS FOR THE CANDIDATES**

1. Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.
2. Use of non-programmable scientific calculator is allowed.

#### **SECTION-A**

Introduction to Java : Features of Java, difference between Java and C++, Byte Code, Advantages of Java, Datatypes-Integer, Floating Point Types, Characters, Booleans, Literals, Variables-Declaration, Dynamic initialization, Scope and Life Time of Variables, Type Conversion and Casting.

#### **SECTION-B**

Arrays- 1-D, Multi-D, Operators-Arithmetic, Bitwise, Relational and Boolean, Assignment Operator, ? operator, Operator Precedence, Control Statements-if, Switch, While, do while, for, nested loops, Jump statements-Break, Continue, Return.

**SECTION-C**

Classes-Introduction, Objects, Assigning Object reference variables, Methods-Returning Value, Passing Parameters, Constructors, This keyword, Garbage Collection, Finalized Method, Parameterized Constructors.

Overloading Constructor, Using Objects as Parameters, Returning Objects, Recursion, Nested & Inner Classes.

**SECTION-D**

Inheritance-Basics, Using Super, Creating Multilevel Hierarchy, Method Overriding, Using Abstract Classes, Using Final with inheritance. Packages & Interfaces & Implementing, Defining & Using a package. Interface-Defining and implementing an interface, Applying interfaces, Variables in interfaces.

Exception Handling-Fundamentals, Types, Using Try and Catch, Multiple Catch Clauses, Using Throw, Throws, Finally, Java Built in Exceptions

**Text Book:**

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill.

**Reference Books:**

1. Gilbert, Stephan D. and William B. Hccarthy, Object Oriented Programming in Java ,The Waite Group Press.
2. Mary Campione and Kathy Walrath, The Java Tutorial, Addison - Wesley.
3. Horstmann, Cay S. and Gary Cornell, Core Java 2 : Fundamentals Vol. 1, Pearson Education.
4. Balagurusamy, Programming with Java : A Primer, Third Edition, Tata McGraw Hill Publishers.
5. Jeffry A. Borrer, Object Oriented Programming with Java-An Ultimate Tutorial, Dream Tech Press, First Edition.

**BCA-303: INTERNET PROGRAMMING****Maximum Marks : 80****Maximum Time : 3 Hrs.****Min. Pass Marks : 35%****A) INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all .

**B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

**SECTION-A**

Introduction to Internet, www, http, webpages & URL and HTML. Markup vs. Traditional programming languages.

Creating HTML pages, viewing pages in different browsers.

Structures of HTML page, tags and attributes, color codes and fonts, different elements in head section of HTML document

**SECTION-B**

Text-formatting tags, applying formatting to the body section of HTML document, block level and text level tags, behavior of formatting tags in different browsers

Creating external and internal links.

Adding graphics with image tag, image element attributes, using images as links, image maps, supported image file formats

Tables : Presenting information in tables, table attributes, table as layout tool, nested tables

**SECTION-C**

Scripts: Client Side vs Server Side Scripts, Comparison of Static and Dynamic Web Pages. Components of an ASP File, Creating And Viewing ASP File. VB Script-Variables & Constants, Arrays, Operators, Control Structures, Procedures

**SECTION-D**

Built in ASP Objects, Response Objects, Applications of Response Object-Sending HTML to a Web browser, Buffering the output of ASP pages.

Request Object: Properties, Networks & Collections.

Working with Databases- ADO Model, Connection Object, Record set Object

**Text Book:**

1. Deitel, Deitel and Nieto, *Internet & WWW. How to Program*, Pearson Education Asia.

**Reference Books:**

1. E Stephen Mack, Janan Platt, *HTML 4.0, No Experience Required*, BPB Publications.

2. *HTML Complete* by Sybex, BPB Publications.
3. Bayross, *Web Enabled Commercial Applications Development Using HTML, DHTML, Java Script, Perl CGI*, Third Edition, BPB Publications.
4. Scott Mitchell, *Designing Active Server Pages*, O'Reilly.
5. Keith Morneau, Jill Batistick, *Active Server Pages*, First Edition, Vikas Thomson Learning.
6. Smith, A. Eric, *Active Server Pages 3 Programming Bible*, Wiley India.

### **BCA-304: OPERATING SYSTEMS**

**Maximum Marks : 80**

**Maximum Time : 3 Hrs.**

**Min. Pass Marks : 35%**

#### **A) INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will consist of 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

#### **B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.

#### **SECTION-A**

Introduction to operating System, its need and Operating system services, Definition, Early systems, Simple batch systems, Multiprogrammed batched systems, Time sharing systems, Personal computer systems and Real time systems. Process Management: Process concept, Process scheduling,

#### **SECTION-B**

CPU Scheduling : Basic concepts, Scheduling criteria, Scheduling algorithms : FCFS, SJF, Round Robin & Queue Algorithms. Deadlocks : Deadlock characterization, Methods for handling deadlocks, Banker's Algorithm.

#### **SECTION-C**

Memory Management : Logical versus Physical address space, Swapping, Contiguous allocation, Paging, Segmentation.

Virtual Memory : Demand paging, Performance of demand paging, Page replacement, Page replacement algorithms, Thrashing.

**SECTION-D**

File management : File system Structure, Allocation methods: Contiguous allocation, Linked allocation, Indexed allocation, Free space management: Bit vector, Linked list, Grouping, Counting.

Device Management: Disk structure, Disk scheduling : FCFS, SSTF, SCAN, C-SCAN, LOOK, Selecting disk scheduling algorithm.

**Text Book:**

1. Abraham Silberschatz, Peter B. Galvin, *Operating System Concepts*, Addison-Wesley publishing Co.

**Reference Books:**

1. Nutt Gary, *Operating Systems*, Addison Wesley Publication.
2. Andrew S. Tannenbaum, *Modern Operating Systems*, Pearson Education Asia,
3. William Stallings, *Operating Systems, Internals and Design Principles*, 4th Edition, PH.
4. Ekta Walia, *Operating Systems Concepts*, Khanna Publishes, New Delhi.

**BCA-305: SOFTWARE ENGINEERING****Maximum Marks : 80****Max. Time : 3 Hrs.****Min. Pass Marks : 35%****A) INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all .

**B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.

**SECTION-A**

Introduction to Software Engineering : Origin, Definition and goals of Software Engineering. Comparison with traditional Engineering Disciplines.

Software development process, Process Models : Waterfall, Spiral, Prototype. Error distribution, Effort distribution, Role of metrics and measurements.



**SECTION-B**

Software Project Planning : Planning activities, Team structure (Democratic, Chief-programmer, Hierarchical). Software Requirement Specification : Role, characteristics and components of SRS. Problem Analysis : Structuring Information, DFD and Data Dictionary.

**SECTION-C**

Software Design : Design Objectives and principles, Design concepts - Abstraction, Information hiding, Concurrency, Modularity. Coupling-Cohesion criteria. Structured design methodology. Design specification, Metrics

**SECTION-D**

Coding, Structured coding techniques : Data Encapsulation, Go to statement, Recursion, Single Entry Single Exit criteria. Structured programming.

Testing, Testing Fundamentals : Error, Fault, Failure and Reliability, Levels of testing, Test case and Test criteria, Top-down and bottom-up approach, Test case execution and analysis, Test report.

**Text Book:**

1. P. Jalota, An Integrated Approach to Software Engineering, Narosa Publishing House.

**Reference Books:**

1. R.E. Fairley, Software Engineering Concepts, McGraw-Hill.
2. Ian Sommerville, Software Engineering, Pearson Education.
3. Roger. S. Pressman, Software Engineering - A Practitioner's Approach, McGraw Hill.
4. Yogesh Singh and K. K. Aggarwal, Software Engineering, New Age International, Paperback.

**BCA-306: COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS**

**Max. Marks : 80**

**Max Time : 3 Hrs.**

**Min. Pass Marks : 35%**

**A) INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry

20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### **B) INSTRUCTIONS FOR THE CANDIDATES**

1. Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.
2. Use of non-programmable scientific calculator is allowed.

#### **SECTION-A**

Floating point representation of numbers, arithmetic operation with normalised floating point numbers and its consequences, errors in numbers, binary representation of numbers.

Solution of transcendental equations, bi-section method, Regula-falsi method, Newton/Raphson method, secant method, solution of polynomial equations.

#### **SECTION-B**

Solution of simultaneous non-linear equations. Solution of simultaneous algebraic equations, Gauss elimination method, pivoting, ill-conditioned equations, Gauss-Seidel iterative method, comparison of direct and iterative method.

#### **SECTION-C**

Interpolation, Lagrange's interpolation, difference tables, truncation error in interpolation, spline interpolation.

Approximation of functions, linear regression, polynomial regression, exponential and trigonometric approximation, Taylor series representation, Chebyshev series.

#### **SECTION-D**

Introduction to Statistics : Meaning, scope, collection, classification of data. Application based on and processing logic of measures of central tendency, dispersion, skewness and kurtosis.

Bivariate Data : Correlation, Meaning, and Type of correlation, correlation and causation, methods of studying correlation, algorithm to compute Karl Pearson's Correlation and rank correlation. Applications based on correlation.

Linear Regression : Processing logic of and numericals based on fitting of regression lines (Using least square method), Various Properties relating to correlation and regression .

#### **Text Book:**

1. V. Rajaraman, *Computer Oriented Numerical Methods*, PHI, New Delhi.

**Reference Books:**

1. J. H. Mathews, *Numerical Methods for Computer Science, Engineering and Mathematics*, PHI.
2. M. K. Jain, S.R.K. Iyengar and R.K. Jain, *Numerical Methods for Scientific and Engineering Computation*, Wiley Eastern Limited, New Delhi.
3. S. C. Chopra and R.P.C Anale, *Numerical Methods for Engineers*, McGraw-Hill, New York.

**BCA-307: SOFTWARE LAB – V (PROGRAMMING IN JAVA)****Maximum Marks : 50****Maximum Time : 3 Hrs.****Min. Pass Marks : 35%**

This laboratory course will comprise of exercises to supplement what is learnt under Paper BCA-302: Java Programming.

**BCA-308: SOFTWARE LAB – VI (Internet Programming)****Maximum Marks : 50****Maximum Time : 3 Hrs.****Min. Pass Marks : 35%**

The laboratory course will comprise of exercises to supplement what is learnt under Paper BCA-303: Internet Programming.