

SECOND SEMESTER

PGDCA-210

JAVA PROGRAMMING

Maximum Time : 3 Hrs.

University Examination : 70 Marks

Total Marks : 100

Continuous Internal Assessment : 30 Marks

Minimum Pass Marks : 40%

(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 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will

cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:

1. 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.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction to Java: Features of Java, difference between Java and C++, data types, variables, arrays, operators-arithmetic, bitwise, relational, Boolean, various control statements.

SECTION B

Introduction to Classes: Class fundamentals, declaring objects, methods, constructors, garbage collection, passing parameters to methods, recursion, access control, static, final and finally method, Array One dimensional array, Two Dimensional array multidimensional, Function, Functions Overloading.

SECTION C

Inheritance, super class, multilevel inheritance, abstract methods and classes. Packages and interfaces, importing packages, exception handling. Exception types, try, catch, finally, throw and throws, creating exception subclasses. Multithread programming, thread priorities, synchronization, messaging, creating multiple threads, Inter thread communication.

SECTION D

Networking, socket overview, client/server, reserved sockets, proxy servers, Internet addressing, Java and the Net, TCP/IP client sockets. An introduction to AWT, GUI graphics, fonts, colours. Introduction to servlet, servlet lifecycle, JSP, JSP lifecycle.

References:

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill, 1999.
2. E. Balaguruswami, "Programming with Java"nd(2 Edition), TMH.

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B) Instructions for candidates

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SECTION A

OOP paradigm, Advantages of OOP, Comparison between functional programming and OOP approach, characteristics of Object oriented Language objects, Class, Inheritance, Polymorphism, and abstraction, encapsulation, Dynamic Binding, Message passing. Introduction to C++, Identifier and keywords, constants, C++ Operators, Type conversion, variable declaration, Statement, expressions, User defined data types, Conditional expression (For, While, Do-while) loop statements, breaking control statements (Break, Continue)

SECTION B

Defining a function, types of functions, Inline functions, Call by value & Call by reference, Pre-processor, Header files and standard functions, Structures, Pointers and structures, Unions, Enumeration.

SECTION C

Classes, Member functions, Objects, Array of objects, Nested classes, Constructors, Copy constructors, Destructors, Inline member functions, Static class member, friend functions, Dynamic memory allocation. Inheritance, Single inheritance, Multi-level, Hierarchical, Virtual base class, Abstract classes, Constructors in Derived classes, Nesting of classes.

SECTION D

Function overloading, Operator overloading, Polymorphism, Early binding, Polymorphism with pointers, Virtual functions, Late binding, Pure virtual functions, Opening and closing files, Stream state member functions, Binary file operations, Structures and file operations, classes and file operations, Random access file processing.

Reference:-

1. D. Ravichandran, "Programming with C++", TMH, 1996.
2. Robert Lafore, "Object oriented programming in Turbo C++", Galgotia publications, 1994.
3. Bjarne strautrup, " The C++ Programming Language", Addison Welsly publication co. 1995.
4. Yashvant Kanetkar, "Let us C++", BPB.

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question paper and the entire section E.

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SECTION A

Space and time complexity, Asymptotic notations (Ω , θ , O , ω , \circ), Arrays :- One Dimension and two Dimensional Arrays (Storage in Row – major & column major order).

Queue Structures: Insertion, deletion, Priority Queue, D-Queue.

Stack:- Push, Pop operations, Polish notation, Algorithm for Infix to Postfix conversion, Evaluation of Postfix expression.

Link lists , singly link list, Doubly link list, advantage and disadvantage.

SECTION B

Tree basic concept, Tree representation by link list and by arrays, Binary tree, Binary search

tree (Operations:- Insertion, Deletion, Traversals), Heap sort, AVL, B-tree.

SECTION C

Graph concepts, Adjacency list and adjacency matrix representation, DFS, BFS, Topological sorting, shortly connected components, Prims & Kruskal's algorithm, Dijkstra's algorithm, Warshall's algorithm.

SECTION D

Linear search, Binary search, Bubble sort, selection sort, Insertion sort, Quick sort, Heap sort, Merge sort, Bucket sort, Radix sort and their Comparison in terms of space & time complexity.

Reference:

1. Sartaj Sahni, "Data structures Algorithms and Applications in C++", TMH.

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SECTION A

Definition of Internet, Internet organisation and committees, Internet, Growth of Internet, Internet- 3, Anatomy of Internet, Internet Application, Portals, Introduction about WWW, Definition of DNS (Domain Name System), IP Addressing.

SECTION B

Definition of Networks, Types of Network, Topologies, PSTN, PSDN, VAN, ISDN, PDNs, Wide Area Network, Introduction about search engines (Mozilla, Netscape, Opra) Email, Introduction about mail protocol (SMTP, MME), X.25, Frame relay, PPP, NNTP, SMTP, etc.

SECTION C

OSI Reference method, TCP/IP model, FTP, HHTP, HTTPS, Addressing in Internet (Class A,B,C,D,E) Definition of Ethernet, Intranet, Telnet, Wireless communication, Virtual Circuits, ISDN model, CSMA/CD, Explanation of all layers of OSI and TCP/IP model.

SECTION D

Introduction about HTML, Tag, Types of Tags, Forms, Tables, Images insertion in web page, Introduction about DMTL, CGI, Introduction about XML.

Reference:-

1. A.S. Tanenbaum, "Computer Networks"rd(3rd Edition), PHJ, 1999
2. D.E.Comer, "Computer Networks and Internet"nd(2nd Edition), Addison wisely, 2000
3. D.Betsekas and R.Gallagar, "Data Networks"nd(2nd Edition), PHI, 1992
4. Frougan "Data Communications & Networks"nd(2nd Edition), TMH

PGDCA-250 P SOFTWARE LAB (JAVA PROGRAMING)

Maximum Time : 3 Hrs.

Total Marks : 100

Minimum Pass Marks : 40%

University Examination : 70 Marks

Continuous Internal Assessment : 30 Marks

This laboratory course will mainly comprise of exercises on what is learnt under paper :
PGDCA-210 (Java Programming).

PGDCA-260 P PROJECT

Maximum Time : 3 Hrs.

Total Marks : 100

Minimum Pass Marks : 40%

University Examination : 70 Marks

Continuous Internal Assessment : 30 Marks

1. Students are supposed to spend 45-55 hours on the project. The internal teacher must monitor progress of the Project. Students can arrange the project at their own level, however, Institute can also assist in getting the project and can issue necessary letters etc.
2. The external examiner will distribute marks allocated for University examination for viva/project report and for any other activity, which the external examiner thinks to be proper.

Maximum Marks for Project Application

60%

Max marks for Viva

40%

3. Joint projects will be allowed and joint project reports will also be accepted. The students should highlight their contributions in a joint project report.
4. The students have to submit two copies of Project reports. The examiners will evaluate these reports on the spot at the time of examination and will conduct the viva.