4015

BCA IIIrd Semester Examination, 2024

OBJECT ORIENTED PROGRAMMING USING JAVA

Paper : NBCA–301

Time : 2 Hours] [*M.M. : 70*

Note :– Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section–A [10×1=10]

Note :– Attempt any *one* question.

1. Explain the concept of object-oriented programming. Also state and explain scope of variable with an example.

Or

2. Draw complete architecture of JVM. Describe the use of each component in JVM.

Section–B [20×3=60]

Note :– Attempt any *three* questions.

3. What is inheritance in Java ? Explain its types. Write programme to show the use of super keyword in inheritance.

4. What do you mean by constructor ? Differentiate between default constructor and parameterized constructor with example.

5. Differentiate between interface and abstract class. Also write a Java programme to demonstrate how to extend an interface.

6. Explain the concept of Wrapper class. Write Java programme to demonstrate one dimensional array.

7. Explain method overloading with the help of program. Write the three ways of method overloading.

8. Discuss different types of packages with suitable example. How to add new class to a package ? Explain with an example.

9. (a) What is exception and what are the different exception handling mechanisms ?

   (b) Explain user defined exceptions with program.

10. What is thread in Java ? Explain the life cycle of thread.

4016

BCA IIIrd Semester Examination, 2024

SOFTWARE ENGINEERING

Paper : NBCA–302

Time : 2 Hours] [*M.M. : 70*

Note :– Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section–A [10×1=10]

Note :– Attempt any *one* question.

1. Differentiate between Software engineering process and Conventional engineering process. Furthermore, illustrate software characteristics and software crisis.

Or

2. Explain spiral model with diagram having its advantages and disadvantages. As well as, explain the goal of Software development life cycle (SDLC) with its stages.

Section–B [20×3=60]

Note :– Attempt any *three* questions.

3. Describe the term data flow and flow chart with their symbols. Additionally, clarify A software requirements specification (SRS) with its characteristics.

4. Expound Software Engineering Institute Capability Maturity Model (SEICMM). Furthermore, differentiate between Verification and Validation.

5. Explicate the three phases of design in software design process. Besides, illustrate system design strategies and control flow graphs.

6. Explain coupling and cohesion with its types, advantages and disadvantages.

7. Annotate alpha testing and beta testing. Moreover, differentiate between drivers and stubs.

8. Explain in detail functional and non-functional testing.

9. Suppose a project was estimated to be 400 KLOC. Calculate the effort and development time for each of the three model *i.e.*, organic, semi-detached & embedded. Besides, elucidate Constructive Cost Model (COCOMO) with its types.

10. A project size of 200 KLOC is to be developed. Software development team has average experience on similar type of projects. The project schedule is not very tight. Calculate the effort, development time, average staff size, and productivity of the project. Over and above that, explain the need of software maintenance and reverse engineering.

8. Classify the different types of pipelines used in computer processors.

   (i) What is the difference between 'instruction pipelines' and 'data pipelines' ? Provide examples of processors that use each type.

   (ii) How can pipelines be classified based on the 'degree of parallelism' ?

9. Explain the concept of 'latency' in the context of memory access.

   (i) What factors contribute to memory latency ?

   (ii) How does latency affect the performance of programs, particularly those with large data sets or frequent memory accesses ?

10. Define program flow mechanism in the context of computer systems.

   (i) What are the main objectives of program flow control during the execution of a program ?

   (ii) How does program flow control affect instruction execution and program behavior ?

4017

BCA IIIrd Semester Examination, 2024

COMPUTER ARCHITECTURE

Paper : NBCA–303

Time : 2 Hours] [*M.M. : 70*

Note :– Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section–A [10×1=10]

Note :– Attempt any *one* question.

1. Define 'computer organization' and 'computer architecture.'

   (i) What are the main differences between computer organization and computer architecture ?

   (ii) How do the concepts of computer architecture and organization relate to each other in the design of a computer system ?

Or

2. List and describe the major components of a computer system.
   (i) What are the primary functional units of a computer ?
   (ii) Explain the role of each component in the execution of a program.

Section–B [20×3=60]

Note :– Attempt any *three* questions.

3. Explain Flynn's Taxonomy of computer architectures :
   (i) Describe the four categories of Flynn's classification :
      (a) SISD (Single Instruction Stream, Single Data Stream)
      (b) SIMD (Single Instruction Stream, Multiple Data Stream)
      (c) MISD (Multiple Instruction Stream, Single Data Stream)
      (d) MIMD (Multiple Instruction Stream, Multiple Data Stream)
   (ii) Provide real-world examples for each category of Flynn's taxonomy, explaining how each category is used in modern computing systems ?

4. What is pipeline 'throughput' and how does it relate to pipeline 'latency' ?
   (i) Explain the difference between these two terms.
   (ii) Why is pipeline throughput generally higher than latency ?
5. Discuss the differences between the following parallel execution models :
   (i) SIMD (Single Instruction, Multiple Data)
   (ii) MIMD (Multiple Instruction, Multiple Data)
6. Define the PRAM model of parallel computation :
   (i) What are the main components of the PRAM model ?
   (ii) What assumptions are made in the PRAM model regarding the parallel computing environment ?
7. Discuss the importance of a memory hierarchy in computer design.
   (i) What is the purpose of organizing memory in a hierarchy, and how does it optimize system performance ?
   (ii) How do memory management techniques, such as paging and segmentation, improve the efficiency of memory usage ?

4018

BCA IIIrd Semester Examination, 2024

PYTHON PROGRAMMING

Paper : NBCA–304

Time : 2 Hours] [*M.M. : 70*

Note :– Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section–A [10×1=10]

Note :– Attempt any *one* question.

1. Give the features of python ? Write Python Program for generate *n*th Fibonacci number.

Or

2. Discuss different types of functions in Python. Built-in, User defined, Anonymous Lambda, Recursive and Higher-Order Functions.

Section–B [20×3=60]

Note :– Attempt any *three* questions.

3. List the standard data types in Python. What are python strings ? Write Python program to check if a string is palindrome or not.

4. Give the features of python dictionaries. Python program to find the sum of all items in a dictionary.

5. What do you mean by scope of variables declared in user define functions ? How modules are differs from functions in python ? What is the use of dir() function ?

6. What is the difference between list and tuple ? What is indexing and negative indexing in Tuple ? What is the output of print tuple[1 : 3] if tuple = ('abcd', 786 , 2.23, 'John', 70.2) ?

7. Explain the use of in-build functions with suitable examples divmod(),enumerate(), trunc(). Write a program to print list in Descending order 10,2,0,50,4 ?

8. Discuss OOPs concepts in Python. What is class and object ? State its syntax with example.

9. What is meant by inheritance ? Explain multiple inheritance with an example.

10. Write a short note on Set. Write Python program to split and join a string.

4019

BCA IIIrd Semester (NEP) Examination, 2024

ACCOUNTING & FINANCIAL MANAGEMENT

Paper : NBCA–305

Time : 2 Hours] [*M.M. : 70*

Note :– Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section–A [10×1=10]

Note :– Attempt any *one* question.

1. Answer all the following :

(i) Who are the user of accounting information ? Elucidate.

(ii) Pass journal entries in each of the following cases :

(1) Payment made to Ram ₹ 1,000. He allowed a cash discount of ₹ 50.

(2) Cash received from Suresh ₹ 800 and allowed him ₹ 50 as discount.

(3) A running business was purchased by Mohan with the following assets and liabilities :

Cash	₹ 2,000
Land	₹ 4,000
Furniture	₹ 1,000
Stock	₹ 2,000
Creditors	₹ 1,000
Bank Overdraft	₹ 2,000

8. What do you understand by analysis of Financial Statements ? What are the various tools of such analysis ? Explain briefly.

9. Calculate Current Assets, Current Liability, Stock Turnover Ratio from following information :

Current Ratio	= 2.5
Working Capital	= 60,000
Opening Stock	= 29,000
Closing Stock	= 31,000
Sales	= 3,20,000
Gross Profit Ratio	= 25% on sales

10. Explain the traditional and modern approaches to financial management.

Debtors and Creditors	6,500	1,200
Bills Receivable and Bills Payable	1,500	700
Cash at bank	1,200	—
Cash in hand	190	—
Salaries	800	—
	46,700	46,700

Additional Information :

(i) Stock as on 31-12-91 was value at ₹ 1,500

(ii) Insurance was prepaid to an extent of ₹ 40

(iii) Outstanding liabilities for salaries ₹ 200, taxes ₹ 130

(iv) Depreciation building at 2% per annum.

7. Explain the rationale of making adjustments at the time of preparing the Final Accounts. Give adjustment entry and treatment in Final Accounts in case of (a) Income received in advance, and (b) Bad debts.

(iii) List out the contents of trading account.

(iv) Classify the following into cash flows from operating, investing and financing activities :

(a) Cash payment to purchase a machinery

(b) Cash sales of goods-in-trade

(c) Cash receipts from issue of shares

(d) Cash payment of salaries and wages to employees

(v) List various long-term sources of finance. Explain briefly any two of these.

Or

2. "Accounting principles are developed to ensure uniformity in accounting practice." With reference to this statement, explain briefly various concepts and conventions of accounting.

Section–B [20×3=60]

Note :– Attempt any *three* questions.

3. What is meant by Accounting ? Explain various steps in the accounting process. Also give advantages and limitations of accounting.

4. What is meant by an Account ? Explain the different categories in which various accounts can be classified. Also state the rule of 'debit and credit' in this connection.

5. What is a Trial Balance. Explain its objectives. Discuss various methods of preparation of trial balance.

6. From the following Trial Balance of Madhu & Co., prepare a trading and profit and loss account for the year ended 31-12-1991 and also prepare the balance sheet.

TRIAL BALANCE

Particulars	Debit ₹	Credit ₹
Madhu's Capital	—	29,000
Madhu's Drawings	760	—
Purchases and sales	8,900	15,000
Sales and purchases returns	280	450
Stock (1-1-91)	1,200	—
Wages	800	—
Building	22,000	—
Freight and carriage	2,000	—
Trade expenses	200	—
Advertisement	240	—
Interest	—	350
Taxes and insurance	130	—