BCSL306

G. H. Raisoni College of Engineering

(An Autonomous Institution)

Fifth Semester B.E. (Computer Science & Engineering)

End Semester Examination Winter - 2015

Software Engineering & Project Management

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) All questions are compulsory.

1. Choose the most appropriate answer of the following questions:

(a) Which of the following are not the characteristics of Software 2
(i) Software is flexible (ii) Software does not wear out
(iii) Software always correct (iv) Software not manufactured

(b) Which of the following is not one of the Software Engineering Layers 2
(i) Process (ii) Manufacturing (iii) Methods (iv) Tools

(c) During Software Development which factor is most crucial 2
(i) People (ii) Product (iii) Process (iv) Project

(d) Agile Modeling provide guidance to practitioner during which of these software task 2
(i) Analyses
(ii) Coding
(iii) Testing
(iv) All of these

(e) UML activity diagrams are useful in representing which analysis model element 2
(i) Behavior Element. (ii) Class based Element.
(iii) Flow based Element. (iv) Scenario based Elements.

(f) The Entity Relationship Diagram 2
(i) Depicts relationships between data objects
(ii) Depicts functions that transforms the data flow
(iii) Indicates how data are transformed by system
(iv) Indicates system reactions to external events

2. (a) Define Software Myths. Explain the various types of Software Myths in detail. 6

(b) Define Software. Explain the various types of Software. 4

OR

(c) Explain the various advantages and disadvantages of Waterfall Model. 4

3. (a) Explain the various Tasks of Requirement Engineering process. Also define the role of Negotiating Requirements. 4

(b) Define Design Engineering. Explain the basic guidelines of Quality Software Design criteria. 4

4. (a) What is Software Maintenance? Explain the advantages of various types of Maintenance in detail. 6

   (b) What is Debugging? Explain the major differences between Testing and Debugging. 4

   OR

   (c) Define the concept of Class Based Modeling. Explain the various steps to create a Behavioral Model. 4

5. (a) Define Software Requirement Specification (SRS). Draw the IEEE Standards for Software Requirement Specification? 5

   (b) Define the role of Integration Testing. Explain the different types of Integration Testing with a suitable example. 5

6. (a) Define Software Project Management. Explain the various types Project Estimation techniques for a Software Project. 4

   (b) Explain the difference between the followings:

   (i) Verification and Validation. 2

   (ii) Coupling and Cohesion. 2

   (iii) Black Box Testing and White Box Testing. 2

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering / Information Technology)

End Semester Examination Winter - 2015

Operating System

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions are compulsory.
2) All questions carry marks as indicated.
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.
5) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) Write a short note on "Context Switch" 2

   (b) Difference between Logical and Physical address 2

   (c) What is System Call? 2

   (d) Explain resource allocation graph. 2

   (e) What is "busy waiting"? How it can be avoided 2

   (f) Difference between uni programming & multi programming. 2

2. (a) What is operating System? Explain the types of Operating System? 6

   (b) What are the services provided by Operating System? 4

3. (a) Explain file different level of directory structure. 6

   (b) Explain file access methods. 4

4. (a) Find out which of the following Algorithm gives the least average waiting time and Turnaround Time for below work load. 6

   1. FCFS 2. RR (Slice=4msec) 3. Preemptive SJF

Process	AT	BT
P0	0	8
P1	1	4
P2	2	9
P3	3	4

OR

   (b) Suppose that a head of a moving head disk with 200 tracks number 0 to 199. An ordered disk queue with request involving tracks 98,183,37,122,14,124,65,67 initial head is at 53 track. what is a total head movement needed to satisfy these request for the following disk scheduling algorithm. 6

   1. FCFS 2. SSTF 3. SCAN 4. C-SCAN 5. LOOK 6. C-LOOK

   (c) Explain scheduler and types of scheduler? 4

5. (a) Explain Page Replacement Algorithms. Any three 6

OR

   b) Explain Segmentation with Paging 6

   c) What is Demand Paging? Explain its advantages & disadvantages. 4

6. (a) What are the necessary and sufficient conditions for deadlock to occur? Explain each in detail. 4

OR

   (b) Explain the step to resolve the Dining Philosophers problem 4

   (c) What is mutual exclusion? Explain the critical section problem 4

BCSL303

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering / Information Technology)

End Semester Examination Winter - 2015

Database Management Systems

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.

1. (a) What is the purpose of Meta data? Where it is stored? 2

   (b) Explain the type of mapping cardinalities , the following have : 2
   - i. Student and ID card
   - ii. Customer and Bank
   - iii. Student and Roll No
   - iv. Customer and Car

   (c) What is a multi valued dependency? 2

   (d) In a transaction, when a dirty read problem arises? 2

   (e) What are different types of locks? Distinguish between them. 2

   (f) How to provide authorization using SQL. 2

2. Solve **Any Two:**

   (a) Consider the following schema: 4
   Suppliers (sid : integer, sname : string, address : string)
   Parts (pid : integer, pname : string, color : string)
   Catalog (sid : integer, pid : integer, cost : real)
   The key fields are underlined and domain of each field is listed after the field.
   Write the SQL and relational algebra expressions for:
   - i) Find the name of suppliers who supply some red part
   - ii) Find the sids of suppliers who supply some red or green parts

   (b) Differentiate between: 4
   - i. Truncate and Drop commands in SQL.
   - ii. Alter and Update commands in SQL

   Also give example of each with syntax.

   (c) Explain the features of relational data model. How it is different from Hierarchical and Network data model? 4

3. Solve **Any Two:**

(a) Explain with suitable illustrations:
- i. Entity vs. Attributes 1
- ii. Binary Vs. Ternary relationship 1
- iii. Generalization Vs. Aggregation 2

(b) What are integrity constraints? Explain any three of them with an example of each. 4

(c) Consider a table R(A,B,C,D,E) and satisfies following FD's: 4
A->BC, B-> D, CD-> E, E-> A.
1) Identify candidate keys
2) Is this table in 2NF? 3NF, BCNF?

4. Solve **Any Two:**

(a) How does a B –Tree differ from B+ tree? Why B+ tree is more commonly used than B-Tree? 4

(b) List the hierarchy of storage media. Also Discuss the mechanism used to read data from or write data to the disk. 4

(c) Describe the three phases of Aries recovery method. 4

5. (a) Discuss the concept of Query Processing .What is a parser? Why it is used? 4

(b) Describe the basic approach used in cost based query optimization in system R.? 4

6. (a) What is a Transaction? List the ACID properties. Explain usefulness of each. 4

(b) Explain the basic time stamp ordering protocol for concurrency control? Also discuss advantages of it over lock based protocols. 4

7. (a) Discuss important characteristics of NOSQL databases in detail 4

(b) Differentiate between NOSQL and Relational databases 4

BITL302

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering / Information Technology / Electronic & Telecommunication Engineering)

End Semester Examination Winter - 2015

Computer Networks

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1.	(a)	Explain the necessity of framing.	2
	(b)	What are different AAL layers?	2
	(c)	Explain bit stuffing.	2
	(d)	What is slotted ALOHA?	2
	(e)	Explain optimality principle.	2
	(f)	Differentiate between TCP and UDP.	2
2.	(a)	Explain OSI reference model along with its advantages and disadvantages.	5
	(b)	Compare and contrast LAN, MAN and WAN.	5
3.	(a)	Compare and contrast guided and unguided transmission media.	5
	(b)	What is ISDN? Explain transmission technique used in broadband ISDN.	5
4.	(a)	Explain different functions performed by data link layer.	5
	(b)	Explain selective repeat protocol along with its advantages & disadvantages.	5
5.	(a)	What is CSMA? Explain it with collision and collision avoidance.	5
	(b)	What is congestion? What are congestion control algorithms? Explain congestion prevention policies.	5
		OR	
	(b)	Compare flow based routing with distance vector routing.	5
6.	(a)	Explain different service primitives along with its meaning in transport layer.	4
	(b)	Explain Scatternet and piconet.	4

MBAL221

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Master of Technology Management $5^1/_2$ Years Course)

(Electrical Engineering / Electronics Engineering / Electronics & Telecommunication Engineering / Computer Science & Engineering)

End Semester Examination Winter - 2015

Business Environment

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1.		Find out True and False statements with reason from the following	12
	(a)	Monetary policy is framed by Reserve Bank of India.	(True/False)
	(b)	Balance of payment is the balance sheet of the country with the rest of the world	(True/False)
	(c)	Reserve requirements is one of the tools of Fiscal policy.	(True/False)
	(d)	EFT is an example of recent technological developments in Indian Banking.	(True/False)
	(e)	The micro environment consists of economic, technical, political forces etc	(True/False)
	(f)	SME stands for Small and medium enterprises.	(True/False)
2.		Discuss the nature and scope of Business Environment	8
3.		Compare and contrast the public and private sectors relative to their size & growth.	8
4.		Discuss the impact of inflation on Business sector.	8
5.		What are the external influences on India's business environment?	8
6.	(a)	Write a note on E-Banking in India.	8
		OR	
	(b)	Write a note on Social responsibility of Business Enterprises.	8
7.	(a)	What are the current globalization trends and challenges?	8
		OR	
	(b)	Discuss the recent technological developments in Indian Banking.	8

(1)

BCSL305

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering)

End Semester Examination Winter - 2015

Principles of Programming Languages

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) Which of the following is a valid comment in C programming? 2

i) /* This is comment */ ii) ** This is comment **
iii) / This is comment / iv) This is comment //

(b) Which of the following is a legal identifier? 2

i) 12age ii) age+2 iii) _my_age iv) my@age

(c) What is the output of the following program segment? 2

```
Int a=5, b=15;
a *= b – 2 + ++b;
printf("%d", a);
```

i) 140 ii) 145 iii) 150 iv) 5

(d) Which of the following statements is TRUE? 2

i) Logical operator && and || are used in if statement only

ii) Comparison operator = = and equality operator = are used in if statement

iii) Logical and comparison operators are used in both selection and repetition condition

iv) None of the above

(e) In which of the following parameter passing mechanisms, the actual argument has to be a variable? 2

i) Pass by value ii) Pass by result iii) Pass by value-result iv) Pass by reference

(f) Heap allocation is required for languages that 2

i) Support recursion

ii) Support dynamic data structures

iii) Uses dynamic scope rules

iv) None of the above

2. (a) Distinguish between dangling pointers and memory leakage. 3

(b) List the benefits of modular development approach. 2

(c) Write the uses of constructor and destructors in OOP. 3

3.	(a)	Explain the concept of inheritance.	3
	(b)	Explain call by reference with example.	2
	(c)	Explain phases of compilation with diagram.	5
4.	(a)	Write implicit and explicit data types.	5
	(b)	Define Record, Union & Pointer.	3
	(c)	Describe loop invariant with example.	2
5.	(a)	What is shared data problem? Explain you idea for solving shared data problem.	5
	(b)	What types of problem can be executed in structured sequence control & how to solve them?	5
6.	(a)	How a subprogram is defined & invoked?	4
	(b)	Convert the following postfix expression into infix and prefix expression. 1 2 + 3 * 6 + 2 3 + /	4
	(c)	What is Polymorphism? Explain with Example.	2

OR

7.	(a)	What is binding? How variables are binded? What are the various methods of binding?	5
	(b)	Explain the concept of TYPE DEFINATIONS?	5

BCSL312

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering / Information Technology)

End Semester Examination Winter - 2015

Computer Graphics & Visualization (Elective-I)

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to the candidates:

1. All questions carry marks as indicated
2. Assume suitable data wherever necessary.

1.		Give the brief answers of following questions	
	(a)	What is run length encoding?	2
	(b)	Write down the shear transformation matrix.	2
	(c)	What is display file interpreter?	2
	(d)	What are the limitations of depth-buffer algorithm?	2
	(e)	How mirror images can be generated?	2
	(f)	List any four properties of Bezier curve.	2
2.	(a)	Define the following terms: i) Refresh ratio ii) Aspect ratio iii) Interlacing iv) Pitch	4
	(b)	Rasterize a line having equation y=3x+15 using DDA algorithm	4
3.		Solve **Any One**	
	(a)	Given a clipping window P(0,0),Q(340,0),R(340,340),& S(0,340) find the visible portion of line AB[(-170,595),(170,255)] and CD[(425,85),(595,595)] against the given window using Cohen-sutherland algorithm.	8
	(b)	Write fence fill algorithm and fill the polygon define by vertices P1(2,2), P2(8,1), P3(8,6), P4(5,3), and P5(3,5) using fence fill algorithm	8
4.		Solve **Any Two**	
	(a)	Prove that two successive reflections about any coordinate axes is equivalent to a single rotation about the origin.	4
	(b)	Find the position of triangle PQR[(2,4),(4,6),(2,6)] after reflection about a line x-2y=-4.	4
	(c)	Preserving the aspect ratio, find a normalization transformation from window whose lower left is at (0,0) and upper right corner is at (10,6) on to the normalized device screen.	4
5.	(a)	For standard perspective projection with vanishing point at (0,0,-d) what is the projected image of a line segment joining P(-1,1,-2d) and Q(2,-2.0).	4
	(b)	Explain the painter's algorithm and also enumerate its drawback.	4
6.	(a)	Enumerate the major difference between Bezier curve and B-spline curve.	4
	(b)	Find the equation of the Bezier curve which passes through (0,0) and(-4,2) and controlled through (14,10) and (4,0).	4
	(c)	Illustrate fractals as a advanced modeling technique & its basic characteristics	8

(7)

BITL301

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering)

End Semester Examination Winter - 2015

Java Programming (Elective-I)

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) Write a program to determine the sum of the following harmonic series for a given value of n: 3
   1 + 1/2 + 1/3 +.....+ 1/n

   (b) Write a correct code and find output. 3

```
class NumberValue
{
    public static void main(String [] args)
    {
        int number=3;
        switch (number)
        {
            case 0 : system.out.println("Number is 0");
                     break;
            case 1 : System.out.println("Number is 1");
            case 2:
            case 3:
            case 3: System.out.println("Number is 2, 3 or 4");
                    break;
            default: System.out.println("Number is less than 0 or greater than 4");
        }
    }
}
```

   (c) Write a program to print the following output. 3

```
$ $ $ $ $
 $ $ $ $
  $ $ $
   $ $
    $
```

   (d) Why to use finally keyword? 1

   (e) Java compiled and interpreted language? Justify 2

2. (a) Assume that a bank maintains two kinds of account for its customers one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. 6
   Create a class Account that stores customer name, account number and type of account. From this derive the classes Curr_acct and Sav_acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:
   (a) Accept deposit from the customer and update the balance.
   (b) Display the balance.
   (c) Compute and deposit interest.
   (d) Permit withdrawal and update the balance.
   (e) Check for minimum balance, impose penalty, if necessary, and update the balance.

(b) Write a program for addition, subtraction, multiplication and division operations using package and follow structure 4
pkg1 package having Addition class & pkg2 package
pkg2 package having Subtraction class & pkg3 package
pkg3 package having Multiplication class & pkg4 package
pkg4 package having Division class

3. (a) Define an exception called "NoMatchFoundException" that is thrown when a string is not equal to "GHRCE". Write a program that uses this exception. 5

(b) Does JAVA supports more than one base classes? Justify your answer. If no, is there any alternate concept to use more than one base classes? Give suitable example. 5

4. Answer the following **(Any Two)**

(a) Write a multithreading Java program to print all numbers below 100 that are both prime and fibonacci number. Design a thread that generates prime numbers below 100 and writes them into an array. Design another thread that generates fibonacci numbers and writes them to another array. The main thread should read both these arrays to identify numbers common to both by using thread class 5

(b) Write a Java program to read a file that contains DNA sequences of arbitrary length one per line (note that each DNA sequence is just a String). Your program should sort the sequences in descending order with respect to the number of 'TATA' subsequences present. Finally write the sequences in sorted order into another file. 5

(c) Write a program for addition of two numbers using an applet which takes input from the user. 5

5. Answer the following **(Any Two)**

(a) Write a menu-driven program for following methods. 5
(i) insert()
(ii) equals()
(iii) replace()
(iv) deleteCharAt()

(b) How inter-thread communication works? Give suitable example. 5

(c) How to create generic interface? Give suitable example. 5

6. (a) How to implement TCP/IP server socket in JAVA? 4

(b) How to establish URL connection? 4

BCSL306

G. H. Raisoni College of Engineering, Nagpur

(An autonomous Institution)

Fifth Semester B.E. (Computer Science & Engineering)

Vacation Examination Winter - 2015

Software Engineering & Project Management

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.

1. (a) The most important feature of spiral model is 2
   i) Requirement analysis. ii) Risk management.
   iii) Quality management. iv) Configuration management.

   (b) Which phase is not available in software life cycle? 2
   i) Coding ii) Testing iii) Maintenance iv) Abstraction

   (c) Which of the following is not software engineering layer 2
   i) A quality Focus ii) Function iii) Methods iv) Tools

   (d) Principle "Components should be loosely coupled to one another and to the external environment" belongs to 2
   i) Communication Practices ii) Deployment Practices
   iii) Modeling Practices iv) Planning practices

   (e) Tasks during Risk analysis in spiral model access 2
   i) Technical Risk ii) Management Risk
   iii) Non Technical Risk iv) Both i and ii

   (f) Software deteriorates rather than wears out because 2
   i) software suffers from exposure to hostile environments.
   ii) defects are more likely to arise after software has been used often.
   iii) multiple change requests introduce errors in component interactions.
   iv) software spare parts become harder to order.

2. (a) Explain software development life cycle, State its important in project management? 6

   (b) State the difference between requirements definition and requirement specification. 6

3. (a) Explain different software design strategies with proper illustrations. 6

   (b) Explain how both waterfall model and the prototyping model can be accommodated in the spiral process model. 6

4. (a) What do you mean by Flow-Oriented Modeling? Explain its advantages? 6

   (b) Explain the role of testing in software? Write different types of testing in details. 6

   OR

   (c) Explain why interface testing is necessary given that individual units have been extensively validated through unit testing and program inspections. 6

5. (a) Explain the A Framework for Product Metrics? 6

   (b) Discuss the difference between verification and validation and explain why validation is a particularly difficult process? 6

   OR

   (c) Explain the COCOMO for software cost estimation. 6

BCSL304

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B.E. (Computer Science & Engineering / Information Technology)

Vacation Examination Winter - 2015

Operating System

Time: Three hr.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) The degree of multi-programming is : 2
   i) the number of processes executed per unit time
   ii) the number of processes in the ready queue
   iii) the number of processes in the I/O queue
   iv) the number of processes in memory

   (b) A page fault occurs 2
   i) when the page is not in the memory ii) when the page is in the memory
   iii) when the process enters the blocked state iv) when the process is in the ready state

   (c) Round robin scheduling is essentially the preemptive version of _____. 2
   i) FIFO ii) Shortest job first iii) Shortes remaining iv) Longest time first

   (d) A critical region 2
   i) is a piece of code which only one process executes at a time
   ii) is a region prone to deadlock
   iii) is a piece of code which only a finite number of processes execute
   iv) is found only in Windows NT operation system

   (e) Virtual memory is _____. 2
   i) An extremely large main memory
   ii) An extremely large secondary memory
   iii) An illusion of extremely large main memory
   iv) A type of memory used in super computers.

   (f) A set of processes is deadlock if 2
   i) each process is blocked and will remain so forever ii) each process is terminated
   iii) all processes are trying to kill each other iv) none of the mentioned

2. (a) Which are the different services provided by Operating System? 5

   (b) If the CPU Scheduling Policy is Round Robin(RR), then find the Completion Time(CT), Turn Around Time(TAT), and Waiting Time(WT) for each process. Time Quantum is 3. The Arrival Time and Burst Time(Service Time) are given below for each process- 7

Process No.	Arrival time	Burst time
1	6	4
2	3	5
3	5	2
4	7	8
5	2	4
6	4	7

3. (a) A disk queue with requests in FIFO order is- 98, 183, 37, 122, 14, 124, 65, 67 8
If the disk head is initially at cylinder 53. What is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of following disk-scheduling algorithms?
   i) FCFS
   ii) SCAN

OR

(a) Explain following space allocation methods- 8
   i) Contiguous Allocation
   ii) Linked Allocation
   iii) Indexed Allocation

(b) How many page faults occurs for Least Recently Used (LRU) page replacement policy for the following reference string, for tree frames- 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 4

4. (a) Write the code for producer & consumer for the producer-consumer problem by using Semaphore concept. 4

(b) Consider the following snapshot of a system: 8

	Allocation	Max	Available
	ABC	ABC	ABC
P0	010	753	332
P1	200	322	
P2	302	902	
P3	211	222	
P4	002	433	

Answer the following questions using the banker's algorithm:
   i) What is the content of the matrix Need?
   ii) Is the system in a safe state
   iii) If a request from process P1 arrives for (1,0,2), can the request be granted immediately?

5. Write Short Note on **(Any Three)** 12
   i. Dining Philosopher problem
   ii. Demand Paging
   iii. Tree-structured directory structure.
   iv. Operating system security strategies.

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering / Information Technology)

Vacation Examination Winter - 2015

Database Management System

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1.		Define the following	
	(a)	Data Models, Schemas, and Instances	2
	(b)	Logical Data Independence	2
	(c)	Physical Data Independence	2
	(d)	DDL and DML	2
	(e)	DBMS and RDBMS	2
	(f)	Three levels of DBMS	2
2.	(a)	Explain the following Commands with proper syntax and example in SQL. (i) Select All Columns (ii) Selecting specific column (iii)Arithmetic Expressions using SELECT command	6
	(b)	Define different types of normalization?	4
3.	(a)	Explain Concept of physical and logical storage hierarchy in database?	5
	(b)	Explain concepts of hash index & B trees with proper example.	5
		OR	
	(c)	Explain Database Aries Algorithm for recovery.	5
4.	(a)	Explain Various techniques for query optimization?	8
	(b)	List the different storage structures used in query optimization?	2
5.		Answer the following:	
	(a)	Two Phase Locking	4
	(b)	Define Transaction and explain the states of life cycle of transaction	4
	(c)	Explain Transaction ACID properties	2
6.		Answer **Any Two** of following	
	(a)	Define NoSQL and reasons for having NoSQL Systems	4
	(b)	List the Key Characteristics of NoSQL Systems	4
	(c)	What is MongoDB ? Explain the Term mapping with RDBMS?	4

BITL 302

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering / Information Technology / Electronics & Telecommunication Engineering)

Vacation Examination Winter – 2015

Computer Networks

Time: Three hr.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1.	(a)	Differentiate between connection oriented service and connectionless service.	2
	(b)	What is the maximum data rate of noiseless channel with 3kHz bandwidth and 2 desecrate levels.	2
	(c)	Calculate Hamming code for data bits 10011010.	2
	(d)	Compare between virtual circuit and datagram subnet.	2
	(e)	Define the role of transport layer.	2
	(f)	Compare Bluetooth and WiFi.	2
2.	(a)	Compare OSI and TCP/IP network model.	5
	(b)	Draw OSI Network model and explain the functionality of each layer.	7
3.	(a)	Differentiate between twisted pair, coaxial cable and optical fiber	4
	(b)	Compare circuit switching, message switching and packet switching.	4
	(c)	Draw ATM cell format and explain role of each field.	4
4.	(a)	Calculate CRC code for data bits 100100 and divisor 1101 and show how CRC checker will find out whether transmission error occur or not.	4
	(b)	What are the different framing techniques use in data link layer.	5
		OR	
	(b)	Describe how congestion control done in virtual circuit subnet and datagram subnet.	5
	(c)	Differentiate between Pure ALOHA and Slotted ALOHA	3
5.	(a)	State how Dijkastra's shortest path algorithm works with example.	4
		OR	
	(a)	Discuss how TCP provide reliability using error control.	4
	(b)	Host and routers are subject to crashes state how transport layer handle that problem.	3
		OR	
	(b)	State different issues handle by transport layer.	3
	(c)	Draw Bluetooth protocol stack and define the functionality of each component of Bluetooth stack.	5

(B)

BCSL305

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering)

Vacation Examination Winter - 2015

Principles of Programming Language

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions carry marks as indicated.
2) All questions are compulsory.

1.	(a)	Define Programming Language.	2
	(b)	State and explain the types of Data Objects.	2
	(c)	Define Abstract Data Type.	2
	(d)	Information known in one part of a program is often needed and used in another part. This is called as _____. (i) Sequence Control (ii) Inheritance (iii) Parameter Passing (iv) None of these	2
	(e)	How the Sequence-control structures can be categorized?	2
	(f)	If it possible to detect all type errors statically in a program, the language is _____. (i) strongly-typed (ii) dynamic (iii) static (iv) none of these	2
2.	(a)	How the languages are classified based on the different language paradigms? Explain.	4
	(b)	How high-level language program is translated to object program? Explain.	4
	(c)	What is Binding? How the Binding Times are classified?	4
3.	(a)	What is Type Checking and what are the ways in which Type Checking is performed?	4
	(b)	How the Structured Data Types are implemented?	4
	(c)	Define Vector. What are its attributes? Explain the implementation of vectors.	4
4.	(a)	What are abstract data types? Explain the concept of data abstraction.	3
	(b)	How a subprogram is defined, invoked and implemented?	6
	(c)	What is a Generic Subprogram? Explain with example.	3
5.	(a)	Explain the concept of Type Equivalence. Give the example of Type Definition with parameters.	6
	(b)	How the sequencing is performed with arithmetic expressions?	6
		OR	
5.	(a)	Why the Heap Storage Management is used for dynamic allocation of data objects?	6
	(b)	Explain the sequence control between statements.	6

BCSL312

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B.E. (Computer Science & Engineering / Information Technology)

Vacation Examination Winter - 2015

Computer Graphics and Visualisation (Elective-I)

Time: 3 Hour] **[Total Marks: 60**

Instructions to Candidates:

1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with help of neat sketches.

1. Answer the following : 12

   (a) Give the fundamentals of Random scan.

   (b) What are the important characteristics of video display devices?

   (c) Brief the Display file structure in detail.

   (d) Give the advantages and disadvantages of DDA algorithm.

   (e) List various scan conversion techniques.

   (f) What is point clipping and Line clipping?

2. (a) Consider a line from(0,0) to (-6,-6). Use simple DDA algorithm to Rasterize this line 6

   (b) Consider a line from(5,5) to (13,9). Use the Bresenham's algorithm to Rasterize a line. 6

   OR

   (b) Generate a circle in first quadrant clockwise direction with radius 6 6

3. (a) Fill the polygon defined by vertices P1(1,1) P2(3,3), P3(5,3) P4(7,1) P5(7,7) P6(5,5) P7(3,5) P8(1,7) using edge fill. Algorithm. 6

   (b) A polygon is defined by the verticesP1(1,2) P2(4,5) P3(7,2) P4(7,5) P5(4,8) P6(1,5). Fill this polygon using fence fill algorithm. 6

4. (a) Window is defined by co-ordinates (o, o) to (30, 30). Clip a line segment (-5, 10) to (50, 20) using Sutherland cohen outcode algorithm. 6

   (b) Explain 3D viewing Transformation. And Find the transformation of the triangle A(1,0) B(0,1) C(1,1) by 6
   i) Rotating 45 degree about the origin then translating one unit in x and y direction.
   ii) Translating one unit in x and y direction and then rotating 45 degree about the origin.

5. Solve **Any Two**

   (a) What is the use of projections? Give the types of parallel projection in detail. 6

   (b) Which algorithms are used for the Hidden surface elimination? Explain Z buffer algorithm in detail 6

   (c) Illustrate the significance of Venn diagram, Euler diagram, pie-chart, bar graph, histogram in computer visualization. 6

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution)

Fifth Semester B. E. (Computer Science & Engineering)

Vacation Examination Winter - 2015

Java Programming (Elective-I)

Time: 3 hrs.] **[Max. Marks: 60**

Instructions to Candidates:

1) All questions are compulsory.
2) All questions carry marks as indicated.
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.

1. (a) Give the meaning of public static void main(String a[]) 2

   (b) What is Java TV? 2

   (c) What is finalize() and Garbage Collection? 2

   (d) Differentiate between abstract class and interface. 2

   (e) What is the difference between a constructor and a method? 2

   (f) Name some Java API Packages 2

2. (a) Write a program in Java to define abstract class called Shape which has three subclasses say Triangle, Rectangle, Circle. Define one method area() in the abstract class and override this area() in these three subclasses to calculate area for specific object i.e. area() of Triangle subclass should calculate area of triangle etc. Same for Rectangle and Circle. 5

   (b) What is wrong with following code : Give explanation? 2

```
public static void start() throws IOException, RuntimeException{
  throw new RuntimeException("Not able to Start"); }
public static void main(String args[]) {
  try {
      start();
  } catch (Exception ex) {
       ex.printStackTrace();
  } catch (RuntimeException re) {
    re.printStackTrace();
} }
```

   (c) Explain static class members with example. Write a program to demonstrate use of static member function and field variable keyword 3

3. (a) Write a java program to find factorial of a given number, the number will be provided by user at run time using i) BufferedReader class, ii) DataInputStream class, iii)Scanner class 6

   (b) Explain features or characteristics of Java? 4

4. (a) Create a class 'Account' with two overloaded constructors. The first constructor is used for initializing, the name of account holder, the account number and the initial amount in the account. The second constructor is used for initializing the name of the account holder, the account number, the addresses, the type of account and the current balance. The Account class is having methods deposit (), withdraw (), and get_Balance(). Make the necessary assumption for data members and return types of the methods. Create objects of Account class and use them 6

   (b) Write a program to copy a file named "Afile.txt" to another file named "Bfile.txt". If the "Bfile.txt" exists, the existing content will be replace, else it will create file with the content of the "Afile.txt". 4

OR

   (b) Write a program in Java to demonstrate Multi level inheritance. 4

5. (a) Write an applet program to draw a bar chart for the following details: 6

Subject	Hindi	English	Maths	Physics
Marks	78	85	98	56

(b) What is polymorphism in java? Explain How Polymorphism is supported in java. 4

6. **Case Study on College Portal & Social Networking Site for Higher Education Community**

The client required developing a college portal and social networking site for higher education community. They wanted to provide an online platform of academic and professional networking for prospective and current college/graduate students, career seekers, college administrators, course instructors/professors, service providers, employers and other interested individuals. It was designed for anyone who is interested in higher education and consists of related news, events, college and graduate programs, course information, financial aids, career information as well as other social networking services. If user is a prospective student then he would find site useful in finding college information and financial aids as well as contact the college administrator directly. If the user is a studying student, he can share the site info with his peers. If he is graduating, he may find job information in academic and industry areas. For higher education professionals the website will help them promote the programs and courses to increase the student enrollment. They wanted users to spend quality time on the website and the same been used to strengthen their connections and reach in higher education community and help them to build their professional networks and thus help in their careers. Following are the features that can be used by the registered members which includes: can browse almost every section of the website including post news, events, messages, comments, questions/answers, classified ads, polls, and resource information, create your profiles, groups, blogs, wikis, view other member's basic profiles, search and apply for jobs etc.

Project Challenges

· Developing a robust framework for the site which is capable of managing millions of users at the same time without slowing the site down.

· Developing and incorporating an extensive list of profile customization options, complex ranking systems and voting contests designed for enhancing users' active participation.

· Synchronizing the integrated features like blogs, messenger and mail to function smoothly while being executed simultaneously.

· Ensuring easy navigation through the implementation of web usability principles in the website design.

· Enabling the site to operate at top speed even in peak traffic hours and maintaining good load balance.

· Ensuring safe and secure transfer of data.

Write down the solution for above challenges. 8

OR

(a) Write a program to implement the concept of Exception Handling by creating user defined exceptions. 4

(b) Write java program to transfer file between client and server using TCP/IP connection? 4