

**G. H. Raisoni College of Engineering, Nagpur**

(An Autonomous Institution)

**Third Term / Fifth Semester B. E. (Computer Science & Engineering)**

Vacation Examination Winter – 2016

**Java Programming (Elective-I)****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
- 2) All questions carry marks as indicated.

- |     |        |   |   |
|-----|--------|---|---|
| (a) | [CO-1] | Which of these access specifiers must be used for main() method?<br>i) private   ii) public   iii) protected   iv) None of the mentioned  | 2 |
| (b) | [CO-2] | Which of the following package stores all the standard java classes?<br>i) lang   ii) java   iii) util   iv) java.packages  | 2 |
| (c) | [CO-2] | Which of these keyword must be used to inherit a class?<br>i) super   ii) this   iii) extent   iv) extends  | 2 |
| (d) | [CO-2] | Which of these method of class StringBuffer is used to concatenate the string representation to the end of invoking string?<br>i) concat()   ii) append()   iii) join()   iv) concatenate() | 2 |
| (e) | [CO-2] | Which of these is correct way of inheriting class A by class B?<br>i) class B + class A {}   ii) class B inherits class A {}<br>iii) class B extends A {}   iv) class B extends class A {}  | 2 |
| (f) | [CO-1] | Modulus operator, %, can be applied to which of these?<br>i) Integers   ii) Floating – point numbers<br>iii) Both Integers and floating – point numbers.   iv) None                         | 2 |
| 2.  | (a)    | [CO-1] Why Java is called as Platform Independent Language?   | 2 |
|     | (b)    | [CO-1] Write a java program that find out reverse of a number passed through command line.  | 4 |
|     | (c)    | [CO-1] Write a java program that show use of copy and parameterized constructor   | 2 |
| 3.  | (a)    | [CO-2] Write a java program that show use of method overriding and explain the concept of method overriding.  | 4 |
|     | (b)    | [CO-3] Write a program to illustrate how to achieve multiple inheritance using multiple interfaces.   | 4 |
|     | (c)    | [CO-4] Write an applet program with a message and display the message in paint () method.   | 4 |
| 4.  | (a)    | [CO-2] Explain the concepts of exception handling. Write a program which tells the use of try, Catch and finally block.   | 4 |
|     | (b)    | [CO-3] What is meant by thread synchronization? Write a program to create and run a Thread.   | 4 |
|     | (c)    | [CO-3] Write a java program that show use of yield (), stop () & sleep () methods   | 4 |
| 5.  | (a)    | [CO-4] Explain different types of streams in java. Write a program to read data from the keyboard and write it to a text file using byte stream classes.                                    | 4 |
|     | (b)    | [CO-5] What are Instance methods and factory methods?   | 2 |
|     | (c)    | [CO-5] Explain socket programming & write a java program to create a server for sending some Strings to the client.   | 6 |
|     |        | <b>OR</b>   |   |
|     | (c)    | [CO-6] Write a program to demonstrate the use of event handling within a class.   | 6 |

**G. H. Raisoni College of Engineering, Nagpur**

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**Third Term / Fifth Semester B. E. (Computer Science & Engineering)**

Vacation Examination Winter – 2016

**Computer Graphics and Visualisation (Elective-I)****Time: 3 hrs.]****[Max. Marks: 60]****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
- 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.

Answer the following:

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- |           |        |  |   |
|-----------|--------|--|---|
| (a)       | [CO-1] | List the different types of line clipping methods available.   |   |
| (b)       | [CO-2] | How many k bytes does a frame buffer need in a 1074 * 878 pixel?   |   |
| (c)       | [CO-2] | Which shedding method is faster and easier to calculate and why?   |   |
| (d)       | [CO-3] | Find the transformation for cavalier projection with $\theta = 60^\circ$   |   |
| (e)       | [CO-2] | Differentiate between oblique and orthogonal projections   |   |
| (f)       | [CO-3] | State the difference between CMY and HSV color model.  |   |
| (a)       | [CO-2] | Describe antialiasing methods in detail.   | 4 |
| (b)       | [CO-2] | Digitize a line from (10,12) to (15,15) on raster screen using straight line Bresenham's algorithm.  | 6 |
| (a)       | [CO-3] | Illustrate all 3D transformation with suitable example   | 6 |
| (b)       | [CO-3] | Consider a clipping window defined by vertices A(-1,-1) B(1,-1) C(+1,1) and D(-1,1) clip a line from P(2,2) to Q(-2,-1) by using Sutherland Cohen algorithm. | 7 |
| 4. (a)    | [CO-3] | Elaborate Warnock's algorithm in detail.   | 6 |
| (b)       | [CO-2] | Fill a polygon defined by vertices A(1,1) B(4,4) C(4,1) D(8,5) and E(1,5) using fence fill algorithm.  | 7 |
| 5. (a)    | [CO-3] | Differentiate parallel and perspective projections and derive generalized transformation matrix for it.  | 6 |
| (b)       | [CO-4] | Discuss Ray tracing method with an example.  | 5 |
| <b>OR</b> |        |  |   |
| (b)       | [CO-4] | Illustrate the significance of control points in curve generation.   | 6 |

**G. H. Raisoni College of Engineering, Nagpur**

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

Vacation Examination Winter – 2016

**Database Management Systems**

Time: 3 hrs.]

[Max. Marks: 60

**Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
- 2) All questions carry marks as indicated.

1. [CO-1] Consider the following relations and write a SQL queries for 12  
 Instructor (ID, name, dept\_name, salary)  
 Department (dept\_name, building, budget)  
 Section (course\_id, sec\_id, semester, year, building, room\_no, time\_slot\_id)  
 Takes (ID, course\_id, sec\_id, semester, year, grade)  
 Teaches (ID, course\_id, sec\_id, semester, year)
  - (a) Delete all tuples in the *instructor* relation for those instructors associated with a department located in the Watson building.
  - (b) Increase salaries of instructors whose salary is over \$100,000 by 3%, and all others receive a 5% raise
  - (c) Find the average instructors' salaries of those departments where the average salary is greater than \$42,000.
  - (d) Find the total number of (distinct) students who have taken course sections taught by the instructor with ID 10101
  - (e) Find the names of all instructors whose salary is greater than the salary of all instructors in the Biology department.
  - (f) Find courses offered in Fall 2009 but not in Spring 2010

2. Answer the following questions 10
  - (a) [CO-2] Illustrate the concept of full functional dependency with suitable example and also specify the Armstrong's axioms for functional dependency.
  - (b) [CO-2] Consider the following PROJECT\_PART relation. In which normal form the PROJECT\_PART relation is? Justify your answer.

PROJECT_NAME	PART_CODE	QTY	VENDOR_NAME
P1	abc	10	Thomas
P1	bca	20	John
P2	abc	30	Thomas
P2	bca	40	Abhishek

Answer **Any Two** questions

10

- (a) [CO-2] Designed a detailed E-R diagram for employee details in company.
- (b) [CO-2] Illustrate the concept of dense and sparse index with suitable example and also specify, when it is preferable to use dense index than sparse index.
- (c) [CO-3] How the log sequence numbers (LSNs) in ARIES are used? What information does the dirty page table and transaction table contain?

Answer the questions

10

- (a) [CO-3] Outline the various stages of query processing in detail.
- (b) [CO-2] Consider the following relations  
EMPLOYEE(EMP-NAME, EMP-ID, BIRTH-DATE, EMP-ADDRESS, EMP-SALARY, EMP-DEPT-NO)  
PROJECT(PROJ-NAME, PROJ-NO, PROJ-LOCATION, PROJ-DEPT-NO)  
WORKS\_ON(E-ID, P-NO, HOURS)  
Heuristically optimize the query:- 'find the names of employees who born after 1970 and who works on project NGP'

Answer the following questions

10

- (a) [CO-2] Enlist the problems that are associated with concurrency control, illustrate them with suitable example
- (b) [CO-3] Provide the schematic for Two-phase locking protocol and specify a schedule with strict two-phase locking with (a) serial execution (b) interleaved execution

6. Answer the following question (**Any Two**)

- (a) [CO-4] Give case study on NOSQL databases and enlist same NOSQL DBMS.
- (b) [CO-3] In relational Algebra explain different types of join commands.
- (c) [CO-3] Describe the database Recovery techniques.

**G. H. Raisoni College of Engineering, Nagpur**  
 (An Autonomous Institution)  
**Fifth Semester B. E. (Computer Science & Engineering)**  
 Vacation Examination Winter - 2016  
**Software Engineering & Project Management**

Time: 3 hrs.]

[Max. Marks: 60

**Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
  - 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) [CO-1] Which one of the following is not an Evolutionary Process Model? 2  
 i) WINWIN Spiral Model                      ii) Incremental Model  
 iii) Concurrent Development Model        iv) Spiral Model  
 v) All are Evolutionary Software
  - (b) [CO-1] Select the option that suits the Manifesto for Agile Software Development 2  
 i) Individuals and interactions                ii) Working software  
 iii) Customer collaboration                    iv) Responding to change  
 v) All of the mentioned
  - (c) [CO-3] Software costs more to maintain than it does to develop. 2  
 i) True                      ii) False
  - (d) [CO-1] Which one of the following is not a step of requirement engineering? 2  
 i) elicitation            ii) design    iii) analysis    iv) documentation
  - (e) [CO-3] Verification is: 2  
 i) Checking that we are building the right system  
 ii) Checking that we are building the system right  
 iii) Performed by an independent test team  
 iv) Making sure that it is what the user really wants
  - (f) [CO-3] In a system design, we do following? 2  
 i) Hardware design after software                      ii) Software design after hardware  
 iii) Parallel Hardware and software design            iv) No hardware design needed
  2. (a) [CO-2] Discuss S/W Engineering is a Layered Technology. 5
  - (b) [CO-1] Define s/w and explain the characteristics of software. 5
  3. (a) [CO-3] How measure, metrics and indicator help the Project manager. Why size oriented metrics is not universally accepted as the best way to measure the process of s/w development? 5
  - (b) [CO-1] What is spiral model for s/w engineering? Explain how does it combine the features of waterfall model and prototype model. 5
  4. (a) [CO-3] Differentiate between white box & black box testing. Also explain Equivalence Method in detail. 5
  - (b) [CO-3] What is Risk in software development? How RMMM plan works. 5
  5. (a) [CO-3] What is Make/Buy Decision? Create a Decision Tree & Explain. 5
  - (b) [CO-3] Explain Integration testing technique with all its approaches. 5
  6. (a) [CO-1] Describe how Scaled Agile Framework works and its advantages over Agile Model. 5
  - (b) [CO-2] What is Clean Room Software Engineering? Explain with Example. 5
- OR**
- (b) [CO-1] What is Scenario-Based Modeling? Explain recent trend. 5

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

Vacation Examination Winter -- 2016

**Operating Systems**

Time: 3 hrs.]

[Max. Marks: 60

**Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
  - 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.
  - 6) Use of non-programmable calculator is permitted.
- (a) [CO-1] It is always possible to support multiprogramming without support of time sharing. However, it is impractical to support time sharing without using multiprogramming. Justify your answer. 2
  - (b) [CO-2] Differentiate Program and Process. 2
  - (c) [CO-2] Which CPU Scheduler is used to reduce the degree of multiprogramming and how? 2
  - (d) [CO-2] How Locality of reference plays an important role in Cache Memory, justify. 2
  - (e) [CO-2] Illustrate "Busy Waiting". How it can be avoided? 2
  - (f) [CO-2] Illustrate thrashing in operating system? 2
  2. (a) [CO-1] Emphasize the role of systemcall in operating system. Explain various types of System Calls. 5
  - (b) [CO-1] List and Explain different services provided by Operating System. 5
  - (a) [CO-2] Given the following queue 98, 183, 37,122,14,124,65,67 with current disk head is at 53 and ending at track 199 calculate the number of head moves using FCFS, SSTF,SCAN,C-SCAN and LOOK disk scheduling algorithms. 5
  - (b) [CO-2] List and explain various file allocation methods 5
  - (a) [CO-2] Consider the following processes, with the arrival time & length of the CPU burst given in milliseconds 5

Process	Arrival Time	Burst Time
P1	0	7
P2	1	5
P3	2	3
P4	3	4
P5	4	2
P6	5	1

For each of the following algorithm, determine average waiting time and average turnaround time.

- (i) Shortest Job First (Non Preemption).
- (ii) Shortest Job First (Preemption).

- (b) [CO-2] Illustrate "Critical Section Problem", what are the constraint that must be satisfied by the solution to the critical section problem. 5

**OR**

- (c) [CO-2] N process share M resource units that can be reserved and released only one at a time. The maximum need of each process does not exceed M and the sum of all maximum need is less than M+N, show that deadlock cannot occur. 5

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

Vacation Examination Winter – 2016

**Computer Networks****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
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- 5) Illustrate your answer wherever necessary with the help of neat sketches.

**1. Answer Any Six questions**

- |     |        |   |   |
|-----|--------|---|---|
| (a) | [CO-1] | With neat diagram explain the working of Coaxial Cable.   | 2 |
| (b) | [CO-1] | What is Error control and Flow control in Data Link Layer?  | 2 |
| (c) | [CO-2] | Draw and explain PPP frame format for unnumbered mode operation.  | 2 |
| (d) | [CO-2] | State the different types of CSMA available.  | 2 |
| (e) | [CO-3] | What is piconets and Scatternets?   | 2 |
| (f) | [CO-3] | Explain Store-and-forward Packet Switching in Network Layer.  | 2 |
| (g) |        | i. Change the following IP address from dotted-decimal notation to binary notation.<br>121.56.55.18   | 2 |
|     |        | ii. Find the error, if any, in the following IP address:<br>13.38.389.67  | 2 |
| 2.  | (a)    | [CO-1] Explain in detail the OSI Reference Model  | 5 |
|     | (b)    | [CO-2] Define the design issues for the Layers.   | 5 |
| 3.  | (a)    | [CO-2] State & draw any 3 different transmission media for data transfer.   | 6 |
|     | (b)    | [CO-3] Differentiate between Circuit Switching and Virtual Circuit.   | 4 |
| 4.  | (a)    | [CO-2] In Data Link Layer explain in detail about "Protocol using Selective Repeat"   | 5 |
|     | (b)    | [CO-2] Illustrate in brief on <b>Any One</b> of the following:<br>i. HDLC.    ii. Protocol using Go back N.    iii. One-Bit Sliding Window Protocol | 5 |
| 5.  | (a)    | [CO-2] With suitable assumptions explain Distance Vector Routing.   | 5 |
|     | (b)    | [CO-3] For Congestion control in Datagram Subnets explain Hop-by-Hop choke packets.   | 5 |
| 6.  | (a)    | How is connect established & released in Transport Layer, explain with proper diagrams.   | 6 |
|     | (b)    | Write short note on client sever architecture.  | 4 |

**G. H. Raisoni College of Engineering, Nagpur**

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**Third Term / Fifth Semester B. E. (Computer Science & Engineering)**

Vacation Examination Winter – 2016

**Principles of Programming Language****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
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- 4) Due credit will be given to neatness and adequate dimensions.
- 5) Illustrate your answer wherever necessary with the help of neat sketches.

(a) [CO-1] Define r-value and l-value with example. 1

(b) [CO-1] Define data object and data value with example? 2

(c) [CO-1] Compare vectors and arrays? (2 points) 2

(d) [CO-2] Define parse tree with example? 2

(e) [CO-2] Define binding time? Give its types? 2

(f) [CO-1] What is mean by decomposition and specification related with abstraction? 2

(a) [CO-2] Explain parameter passing methods with example. 3

(b) [CO-2] Explain the concept of declaration with its purpose. 3

(a) [CO-3] Discuss phases of storage management? 3

(b) [CO-3] Explain attributes of data object. 3

**Solve Any Two**

(a) [CO-4] Explain various operations on character string data? 3

(b) [CO-4] With the help of neat diagram explain phases of translation? 5

(c) [CO-4] Explain specification and implementation of elementary data type. 3

**5. Solve Any Two**

(a) [CO-5] Discuss any one advance topic in programming language with its application? 3

(b) [CO-5] Compare static and dynamic scope? 5

(c) [CO-6] Explain syntactic elements of a language. 5

**6. [CO-5] Explain recent trends in programming language? 8**