Hall Ticket Number :										

R14

Code: 4P2B31

M.C.A. III Semester Regular Examinations January/February 2016

Database Management Systems

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT–I

1. a) List and explain the design issues of entity relationship. 4M

   b) Explain how to build ER model for university with entities department, instructor, student, and class. Instructors and students belong to one department only. Instructors and students related to a class with many to many relations. Assume suitable attributes. Explain how the ER model can be translated to relations. 8M

OR

2. a) What is a partial key? How is it represented in ER diagram? Give an example. 8M

   b) Make a comparison between the weak and a strong entity set. 4M

UNIT–II

3. a) Write a short notes on data log. 4M

   b) What is a relation? Differentiate between the relational schema and a relation instance. 8M

OR

4. a) Give a tuple relational calculus expression to find the maximum value in relation r (A). 6M

   b) "Relational algebra and relational calculus are said to be equivalent in expressive power". Justify the statement. 6M

UNIT–III

5. Consider the following schema
   instructor (ID, name, dept_name),
   teaches (ID, course_id, sec_id, semester, year),
   section (course_id, sec_id, semester, year),
   student (ID, name, dept_name),
   takes (ID, course_id, sec_id, semester, year, grade)

   write the following queries in SQL
   - i. Find the names of the students not registered in any section
   - ii. Find the names of the instructors not teaching any course
   - iii. Find the total number of courses taught department wise
   - iv. Find the total number of courses registered department wise 12M

OR

6. a) How are queries expressed in SQL? How is the meaning of a query specified in the SQL standard? 6M

   b) What are nested queries? What is correlation in nested queries? 6M

UNIT–IV

7. a) Discuss about two phase lock based protocol and time stamped protocol and compare them with suitable examples. 8M

   b) How many types of recovery techniques with concurrent transactions? 4M

OR

8. a) Discuss about log based recovery with immediate update and deferred update with suitable examples. 6M

   b) Draw and explain the architecture of remote backup system. 6M

UNIT–V

9. a) How does a B+ tree index handle search, insert and delete? 8M

   b) Give a brief note on Static and Dynamic Hashing. 4M

OR

10. a) What do you mean by file organization? What is the relationship between files and indexes? 4M

    b) How is data organized in a tree base index? When would you use a tree based index? 8M

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Hall Ticket Number :										

R14

Code: 4P2B32

M.C.A. III Semester Regular Examinations January/February 2016

Computer Communications

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT–I

1. a) What are the applications of a computer network? 5M

   b) What is the role of computer hardware and software in a computer network? 7M

OR

2. a) Compare circuit switching and packet switching. 6M

   b) What are the different multiplexing techniques? 6M

UNIT–II

3. a) How carrier sensing helps in multiple access protocols. What are the disadvantages of it? 4M

   b) What is the format of the frame used by Ethernet? How Ethernet works. 8M

OR

4. a) What is the use of sliding window protocols over elementary protocols? How 1-bit sliding window protocol works. 6M

   b) How DCF and PCF works in wireless LANs. 6M

UNIT–III

5. a) What is the need for fragmentation? How it works. 6M

   b) What are the different classes of IP addresses? What is the range of addresses? What is the number of hosts and networks? 6M

OR

6. How Link state routing works. 12M

UNIT–IV

7. a) What is the header format of UDP protocol? What are the applications which use UDP? 8M

   b) What is tunneling? 4M

OR

8. How Mobile IP works. 12M

UNIT–V

9. How security is provided to e-mails. 12M

OR

10. Write algorithm for DES. 12M

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Hall Ticket Number :										

R14

Code: 4P2B33

M.C.A. III Semester Regular Examinations January/February 2016

Network programming

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT–I

1. a) Write short notes on File permission in unix 4M
   b) Explain the process utilities and filter utilities in Unix with suitable examples. 8M

OR

2. a) Explain layered architecture of linux with neat diagram 6M
   b) Explain regular expressions in filter commands(grep) 6M

UNIT–II

3. a) Write a short notes on the directory management system calls with example 6M
   b) Write a shell script to test the given file is ordinary file or directory file and display the permissions assigned to that file 6M

OR

4. a) Explain chmod and chown systemcalls with examples 6M
   b) Explain input and output redirection in shell 6M

UNIT–III

5. a) What is process, child process , orphan process and daemon process 6M
   b) Explain different types of wait functions 6M

OR

6. a) Explain life cycle of process with different states 6M
   b) Explain terminal login and network login 6M

UNIT–IV

7. a) List the uninterrupted and interrupted signals 6M
   b) Explain kill, alarm and raise functions with example 6M

OR

8. a) Explain kernel support for signals 6M
   b) Explain pause, sigpause functions 6M

UNIT–V

9. a) Write a short notes on IPC mechanism in Linux 6M
   b) Explain shared memory API with program 6M

OR

10. a) Write the drawbacks in all IPC mechanism and how they overcome with other mechanism 6M
    b) Explain connection oriented and connection less communication using socket api 6M

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Hall Ticket Number :										

R14

Code: 4P2B34

M.C.A. III Semester Regular Examinations January/February 2016

Java programming

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT–I

1. a) Define class, variable, method, constructor and an object with syntax 6M

   b) How many objects are required to overload three constructors with no arguments, one argument & two arguments? justify with syntax 6M

OR

2. a) Define any four string functions with examples 8M

   b) What is the significance of garbage collection 4M

UNIT–II

3. Explain the various forms of Inheritance with syntax and block diagrams 12M

OR

4. a) Define superclass, subclass, Inheritance with syntax 6M

   b) Define final variable, method & class with example 6M

UNIT–III

5. Multiple Inheritance is not supported in java directly. How it is implemented. Write a program to implement multiple inheritance in java. 12M

OR

6. a) Illustrate the various packages and hierarchy in java API 6M

   b) Differentiate Interface Vs Abstract classes 6M

UNIT–IV

7. a) Define Exception and list the various java Exceptions 6M

   b) Write a program to handle Exceptions using multiple catch statements 6M

OR

8. a) What are the various compile time & Runtime errors 6M

   b) What are the differences between Multithreading & Multitasking 6M

UNIT–V

9. a) Write a program to read a character and display it using I/O streams 6M

   b) Define i) network address ii) port iii) socket 6M

OR

10. a) What are the Byte and character streams? Explain. 6M

    b) Write a program to display a text file using I/O streams 6M

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Hall Ticket Number :											**R14**

Code: 4P2B35

M.C.A. III Semester Regular Examinations January/February 2016

Design & Analysis of Algorithms

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT–I

1. a) Explain briefly about the Algorithm design and analysis process. 6M
   b) Describe Recurrence equations with a suitable example. 6M

OR

2. a) Explain in detail about the coding an algorithm. 6M
   b) Give a brief note about the analysis of linear search. 6M

UNIT–II

3. a) Describe the Principle of Divide and Conquer technique in detail. 6M
   b) With a suitable example explain In order Traversal of the Binary tree. 6M

OR

4. a) With a suitable example explain Quick sort algorithm to sort set of elements. 6M
   b) Give a brief note on Binary Search. 6M

UNIT–III

5. a) Give brief description about the All pairs shortest paths problem. 6M
   b) Write short notes on the general method of the greedy technique. 6M

OR

6. Explain in detail about the Bellman and Ford algorithm to compute the shortest paths with a suitable example. 12M

UNIT–IV

7. a) Write and explain the recursive backtracking algorithm for sum of subsets problem. 6M
   b) Discuss in detail about the Graph coloring with a suitable example. 6M

OR

8. a) Draw and explain the Tree Organization of the 4-Queens solution space. 6M
   b) Write a short note on Control Abstractions for LC-Search. 6M

UNIT–V

9. a) Explain how the Connected Components of a graph can be obtained. 6M
   b) Write a short note on NP Complete classes. 6M

OR

10. Give a brief description about the Cook's Theorem. 12M

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Hall Ticket Number :										

R14

Code: 4P2B36

M.C.A. III Semester Regular Examinations January/February 2016

Operating Systems

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT–I

1. a) What are the three main purposes of an operating system? Under what circumstances would a user be better off using time-sharing systems? 7M

   b) Why are distributed systems desirable? 5M

OR

2. a) Describe objectives and functions of operating systems? 5M

   b) List the different services provided by the operating system and how system calls are related to this? 7M

UNIT–II

3. a) Explain about 5 state process model. What is PCB? 6M

   b) What is scheduling criteria? Explain about FCFS scheduling with example. 6M

OR

4. a) Explain Dining Philospher's problem and its solution. 6M

   b) Explain the significance of monitors. 6M

UNIT–III

5. a) Explain the concept of deadlock. What are the necessary conditions for it? 6M

   b) Explain some methods for handling deadlocks. 6M

OR

6. Consider the following snapshot of a system:

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P_0	0 0 1 2	0 0 1 2	1 5 2 0
P_1	1 0 0 0	1 7 5 0	
P_2	1 3 5 4	2 3 5 6	
P_3	0 6 3 2	0 6 5 2	
P_4	0 0 1 4	0 6 5 6	

Answer the following questions using the Banker's algorithm:

a. What is the content of the matrix NEED?

b. Is the system in a SAFE state?

c. If a request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately? 12M

UNIT–IV

7.	a)	Explain in detail about internal and external fragmentation?	4M
	b)	What is demand paging and explain any one page replacement algorithm.	8M

OR

8.	a)	What are the different file types supported by an operating system.	5M
	b)	Discuss the merits and demerits of all file allocation methods?	7M

UNIT–V

9.	a)	Differentiate Protection and Security? How access rights are revoked?	6M
	b)	What are the goals of protection? How access matrix can be used achieve protection.	6M

OR

10.	a)	What are the different kinds of Program threats?	6M
	b)	How firewalls can be used to protect the network?	6M

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