

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXI
(MCS-041 : Operating System)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. (a) For the given five processes arriving in the order of the length of CPU time in millisecond :—

Process	Arrival Time	CPU Time
P1	0	6
P2	1	4
P3	2	4
P4	3	3
P5	4	5
- (b) Consider SJF and FCFS scheduling algorithms for the above processes. Which algorithm will give minimum Turn around time and why ?
2. A system contains 10 units of resource R1. The resource requirement of 3 user processes P1, P2, P3 can be summarized as :—

	P1	P2	P3
Max. Requirement	6	6	7
Current Allocation	5	2	3

Is the current allocation state feasible and safe? Apply Banker's Algorithm to check it. If a new request of (2, 1, 0) arises, check whether it will be granted or not using Banker's Algorithm ?
3. Explain 10 basic commands of UNIX Operating system with complete syntax and examples.
4. Define Paging. Explain with an example how Paging is different from segmentation.
5. How is booting done in WINDOWS 2000 operating system ? Explain windows process and threads with the help of a suitable diagram.
6. What is a semaphore ? Give a solution to 'Readers - Writers' problem using semaphore. Explain the steps.
7. Explain different Disk scheduling algorithms with suitable diagrams for the given example. Starting cylinder is 100. In the direction of increasing cylinder number, cylinder request are :—
100, 160, 220, 150, 50, 55, 45, 80, 30
8. With the help of diagrams, explain the concept of demand paging and demand segmentation. For a page Reference string as : 0, 2, 3, 7, 5, 4, 5, 0, 2, 5, 3,7,8 and with three memory frames, calculate the no. of page faults using : **OPT & LRU** Page replacement algorithms.
9. Explain the implementation of RPC in a distributed system. Explain memory organization in UNIX.
10. Explain different types of Multiprocessor Interconnections? What is the significance of Time Consistency ? Explain with an example.



Examination Programme-2013

Master in Computer Application (MCA), Part-III

Date	Papers	Time	Examination Centre
30.03.2014	Paper-XXI	8.00 AM to 11.00 AM	Nalanda Open University, Patna
31.03.2014	Paper-XXII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
01.04.2014	Paper-XXIV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
02.04.2014	Paper-XXV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
03.04.2014	Paper-XXVII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
04.04.2014	Paper-XXVIII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
05.04.2014	Paper-XXIX	8.00 AM to 11.00 AM	Nalanda Open University, Patna
06.04.2014	Paper-XXIII (Practical)	8.00 AM to 11.00 AM	Nalanda Open University, Patna
07.04.2014	Paper-XXVI (Practical)	8.00 AM to 11.00 AM	Nalanda Open University, Patna
09.04.2014	Paper-XXX (Tentative)	8.00 AM to 11.00 AM	Nalanda Open University, Patna

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXII
(MCS-043 : Advanced Database Design)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. The ABC. Bank offers five types of Accounts : loan, checking, savings, daily interest saving and money market. It operates a number of branches within the country. A client of the bank can have any number of accounts. Accounts can be self or a joint account. Draw an E-R diagram for the ABC bank identifying various entities, attributes and cardinality. Show meaningful relationships that exist among the entities. Ceate the relational schema for all the entities in the E-R diagram.
2. What is Transaction management in Database Management system? Explain the ACID properties of Transaction management.
3. Explain the role of ODBC and JDBC with the help of an example. With the help of a process diagram, explain the various tasks involved in the Knowledge Discovery in Databases (KDD) process
4. What are multimedia databases (MMDBs) ? List some of the applications of MMDBs. Describe various contents of MMDBs. Define Multi - valued dependencies and Join dependencies. Give an example of each.
5. Define Normalisation? Why is it required? Differentiate between 3NF and BCNF ? Give examples for each.
6. What is Distributed Database Management? Describe different component of DDBMS? Explain the following two ways to implement the object - oriented concepts in DBMS :—
 - (i) To extend the existing RDBMS to include object orientation.
 - (ii) To create a new DBMS that is exclusively devoted to OODBMS.
7. What is a Data Ware house? Explain the basic components of a DW. Consider a Supply Data of an organization having three dimensions as Supplier, Part and Project. Draw a star schema with supply as the fact table. Make suitable assumptions.
8. Explain the following in the context of ORACLE with examples :—
 - Triggers
 - Security
 - Data Dictionary
 - Indexing
9. With reference to special Databases and GIS explain the following :—
 - (i) Concept and requirements of GIS
 - (iii) Types of Operations on the data captured in GIS
10. Write short notes on any two :—
 - (a) Concurrency Control.
 - (b) Tree - protocol
 - (c) Timestamp - Based Protocol.
 - (d) 2PC(2 Phase Commit)



NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXIV
(MCS-051: Advanced Internet Technologies)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What are HTML Tags and why are they used? Name two HTML tags that are not well formed. Give an example to show how tags are used.
2. Explain the concepts :—
 - (a) JSP
 - (b) Servlet
3. What is web security ? Explain with suitable examples. Explain the different procedure of Recovery after system failure.
4. Describes the important interfaces included in the servlet API, Http Servlet Request and Http Servlet Response along with servlet life cycle.
5. Describe different types of JDBC drivers with their advantages and disadvantages.
6. Write a MDB (Message Driven Bean) that calculates the monthly salary of an employee based on the attendance of the employee. Assume that you have EMP_ATT database available that contains the attendance of the employee.
7. Explain the followings with examples :—
 - (a) XML parser
 - (b) XML Entities
 - (c) SGML
8. Why do we use DTD/XSD ? Explain the advantages of XML over HTML.
9. Discuss the advantages / disadvantages of EJB Architecture in terms of application management, security and inter operability. Explain the life cycle of a stateless session-bean and stateful session bean with diagram.
10. Write short notes on :—
 - (a) HTTP Authentication.
 - (b) Validating parser.
 - (c) Types of Beans.

• • •

<p>MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि Paper-XXX की Project Viva की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।</p>

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXV
(MCS-053 : Computer Graphics and Multimedia)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is Raster Scan and how is it different from Random Scan? What is aliasing? Explain how Antialiasing overcome the problem of aliasing.
2. How do we simulate deceleration in animation scenes? Why the animation seems to be decelerating if the spacing between frames keeps on decreasing ? Graphically discuss the mathematical function used to produce deceleration in any animation?
3. Differentiate between the following :—
 - (i) Zero Acceleration Vs. Non zero Acceleration for simulating Motion.
 - (ii) Hypertext Vs. Hyper Media
 - (iii) GIF Vs. JPEG
 - (iv) Key Frame Vs. Cel Animation
4. With the help of suitable diagram and related tables describe how frame buffer can be used to control the color and intensity of the picture display?
5. (a) Write any three properties of Bezier curve. What are the limitations of Bezier curve?
(b) What is video conferencing? Discuss the challenges related to such facilities.
6. Explain how Z buffer method and scan line methods differ to find the visible surface detection. A polygon has 4 vertices located at A (10, 10) B (10, 40), C (40,10), D (40,40). Indicate a transformation matrix to have its reflection about X-axis?
7. Briefly describe following file formats :—
 - (i) MPEG
 - (ii) MP3
 - (iii) GIF
 - (iv) JPG
 - (v) WAV
8. What are the benefits of Bresenham's line drawing algorithm over DDA algorithm? Compare and contrast the perspective projection with the parallel projection? Justify your answer that parallel projections preserves lateral measurements?
9. Differentiate between following :—
 - (i) Morphing and Panning
 - (ii) Motion Specific animation and Motion Generalized animation
10. Explain the following terms :—
 - (i) Card (or page) based authoring tools.
 - (ii) Frame buffer.
 - (iii) Virtual Reality.
 - (iv) Animation Tools.
 - (v) Video file formats.
 - (vi) Ray Tracing.

• • •

MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि Paper-XXX की Project Viva की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXVII
(MCSE-003 : Artificial Intelligence and Knowledge Management)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Define Artificial Intelligence. What are the concepts of valid and sound arguments ? Explain each with an example.
2. Explain briefly the limitations of an Expert System. Name two frame based expert system shells. Write down frame-based representation of STUDENT.
3. Explain Conjunctive Normal Form (CNF) and Disjunctive Normal Form (DNF) with examples. Translate the following into DNF : $(A \rightarrow B) \rightarrow C$.
4. Describe basic Inference rules and their applications in FOPL. Give examples to explain your answer.
5. What is Prenex Normal form ? Explain with an example. How is it different from Skolem Standard form ?
6. Explain all the knowledge representation techniques used in A.I with examples.
7. Explain each of the following in A.I. :—
 - (a) Fuzzy sets
 - (b) Fuzzy operations
8. Explain each concept in context of LISP :—
 - (a) Association List
 - (b) Property List
 - (c) Recursion in Lisp.
9. How does Prolog system solves problems? Explain Backtracking, Data structure and Data types in prolog, giving examples for each.
10. Discuss state space representation for the following well-known problems :—
 - (a) Travelling Salesman Problem
 - (b) Human Cannibal River-Crossing Problem.

• • •

<p>MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि Paper-XXX की Project Viva की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।</p>

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXVIII
(Numerical and Statistical Computing)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks. Calculator is allowed.

1. (a) Define the following terms :—
 (i) Input Error. (ii) Algorithmic Errors. (iii) Computational Errors.
 (b) Round off the following numbers to four significant digits :—
 (i) 450.92 (ii) 48.3668 (iii) 9.3265 (iv) 8.4155
2. (a) show that the equation $x^3 - 6x - 1 = 0$, has a root in the Interval $(-1, 0)$. Obtain this root using the successive iteration method.
 (b) Use secant method to find the roots of the equations $f(x) = 0.5e^x - 5x + 2$.
3. Given the following system of linear equations determine the value of each of the variables using the Lu decomposition method,
 $6x_1 - 2x_2 = 14$
 $9x_1 - x_2 + x_3 = 21$
 $3x_1 - 7x_2 + 5x_3 = 9$
4. Solve by Jacobi's method the following system of linear equations,
 $2x_1 - x_2 + x_3 = -1$
 $x_1 + 2x_2 - x_3 = 6$
 $x_1 - x_2 + 2x_3 = -3$
5. Evaluate the missing term in the following :—

x	100	101	102	103	104
f(x)	2.000	2.0043	—	2.0128	2.0170

6. (a) Evaluate the integral $\int_0^6 (x^2 + x + 2)dx$ using trapezoidal rule with $h = 1.0$.
 (b) Evaluate the Integral $\int_1^4 x^2 dx$ using Weddle's rule with $h = 0.5$.
7. Evaluate the Integral $I = \int_0^1 \frac{dx}{1+x}$ using Gauss-Legendre three point formula.
8. Using Runge-Kutta method of order 4, find $y(0.2)$ given that $y' = 3x + \frac{y}{2}$, $y(0) = 1$ taking $h = 0.1$.
9. Define simple linear Regression and write its Properties.
10. Define Binomial Distribution and Normal distribution.

• • •

MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि **Paper-XXX** की **Project Viva** की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXIX
(Application Development with .net Framework)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks. Calculator is allowed.

1. Explain .NET Framework components in detail.
2. What is .NET CLASS Library? Explain different types of Namespaces used in .NET Framework.
3. Describe briefly the basic features of ASP.NET and where they are used.
4. Explain the different stages in web form processing. What is Page life cycle?
5. Explain following terms :—
 - (a) Page Processing
 - (b) Event Handling
 - (c) SQL
6. Explain different types Server control. Give the basic syntax for each type of control.
7. What is Personalization in ASP.NET. How Personalization property is added ? Explain with the help of an example.
8. Explain different types of data types in VB.NET with examples.
9. Describe different types of errors that may be found in an application. Explain the error detection and Error handling concepts..
10. Write short notes on :—
 - (a) Benefits of .NET framework.
 - (b) Encapsulation
 - (c) ODBC

• • •

<p>MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि Paper-XXX की Project Viva की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।</p>

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXIII
(MCSL-45 : UNIX and ORACLE)
Annual Examination, 2013

Time : 3 Hours.

Full Marks : 80

Answer all the Questions. All questions carry equal marks. Calculator is allowed.

SECTION 'A'

1. Write the UNIX commands for the following :—
 - (a) Write at least 10 commands in UNIX with syntax.
 - (b) To print the difference between any two given files.
 - (c) To grant the permissions of read, write and execute to the user and read only to the group and others for all the files in a current directory.
 - (d) To direct a standard output to any of the line printer.
 - (e) To list all the files in the current directory whose file names starts with a.
 - (f) To search a string "NOU" in a file ABC.
2.
 - (a) Write a shell program to count no. of characters, no. of blank spaces, no. of words and no. of lines in a given file by the user.
 - (b) Write a shell script to find the day of a given date.

SECTION 'B'

3. Consider the following employee database schema :—
EMPLOYEE (ECODE,ENAME,DESIGNATION, DEPT_NO, SALARY)
DEPENDENT (ECODE, DEPEND_NAME, RELATION, DOB)
DEPARTMENT (DEPT_NO, DEPT_NAME, MANAGER)
 - (a) Draw an E-R diagram for the given relation.
 - (b) Write the following queries using SQL command :—
 - (i) Find details of dependents for employee having name AJAY.
 - (ii) Find the name of the manager of the department in which employee with ECODE 5000 works.
 - (iii) Find the name of all employees whose age is less than 18 years.
 - (iv) Find the DOB of the son of the employee having employee code ECODE 5000.
 - (v) Find the details of the departments in which the employee having employee code ECODE 5000 has worked.

• • •

<p>MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि Paper-XXX की Project Viva की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।</p>

NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-III, PAPER-XXVI

(MCSL-54 : Advanced Internet Technologies and Computer Graphics)

Annual Examination, 2013

Time : 3 Hours.

Full Marks : 100 (80+20)

Answer all the Questions. All questions carry equal marks. Calculator is allowed.

SECTION 'A'

1. Write a Program using Servlet and JDBC for developing online application for displaying results of MCA Program. A student has to score 30 % in theory, practical and assignment to qualify the paper. Create appropriate databases.
2. Write a JSP Program, which displays a web page containing the name of the school, program being offered currently, number of students enrolled in each program, new programs to be offered, eligibility criteria for taking admission in each program.
3. Write a program using JDBC and JSP to display the names and addresses of all those MCA students who are working in Software Development Company.

SECTION 'B'

4. Write a program in C or C++ demonstrate Bresenham's Line generation algorithm?
5. Write a program in C or C++ to produce the sweep representation of a circle and hence produce a cylinder?

• • •

MCA, Part-III के सभी परीक्षार्थियों को सूचित किया जाता है कि Paper-XXX की Project Viva की परीक्षा दिनांक 09.04.2014 को प्रातः 8.00 बजे से बिस्कोमान टावर के बारहवें तल पर आयोजित होगी ।