M.Sc. IT (Part II) Examination, 2013

Operating Systems

Part A (Marks: 10)

1. What is the System cells?
2. What do you understand by Round Robin Scheduling?
3. Write the need for synchronization?
4. What is Semaphore?
5. What do you understand by mutual exclusion?
6. What do you mean by conflict resolution mechanism?
7. What is the use of ? and * wildcards?
8. Why do you need 'Filters' in UNIX?
9. What the use of program counter?
10. Why you have to write a shell script?

Part B (Marks: 10)

1. Write about the Thrashing?
2. What do you understand by demand segmentation?
3. What is 'Process Control Block'? Write its functions.
4. What do you mean by 'Resource Allocation Graph'? Why it is useful?
5. Write the use of $ operator with echo command. Give comments with example.

Part C (Marks: 60)

1. Calculate the average waiting time and average turnaround time using FCFS, SJF (Pro-emptive) and SJF (non-pre-emptive) algorithms for the following set of processes.

Process	CPU Burst time	Arrival Time

	in miliseconds	
P1	6	0
P2	5	1
P3	1	1
P4	4	2

OR

Describe the Deadlock. Write its characterization and methods for handling deadlocks and prevention.

2. What is page removal? Explain the FIFO, LRU and OPT algorithms of page removal with example.

OR

(a) Give the external view of memory manager and write about address space management.

(b) Explain two memory allocation strategies in details.

3. (a) What is Unix shell? Why it is used? Describe the general type of shells available in Unix.

(b) Write a shell script to exchange the values of two variables without using the third variable.

OR

Describe following commands with proper syntax and example:

(a) mail
(b) chgrp
(c) ping
(d) tar
(e) kill

M.Sc. IT (Part II) Examination, 2013

Object Oriented Concepts and C++

Part A (Marks: 10)

1. What is type conversion in C++?
2. Define Encapsulation.
3. How is pointer variable different from an ordinary variable?
4. What is an inline substitution?
5. Define function template.
6. Define a dequeue.
7. List out the basic operations carried out in a linked list.
8. What is a macro and how it is different from a preprocessor?
9. What do you mean by balanced trees?
10. Write the postfix form of the expression -A + B - C + D.

Part B (Marks: 10)

1. What is a nested class? How is a nested class defined and declared in C++?
2. What is a constructor? What are the rules govering the declaration of a constructor?
3. What is an abstract class? What are the advantages of using it in a program?
4. State the difference between arrays and linked list?
5. What is preorder traversal? Explain it with the help of an example?

Part C (Marks: 60)

1. (a) Create a class to overload following operators through friend function:

    (i) <<

    (ii) --

(iii) >

(iv) ()

(b) Explain doubly linked list and its following operations with the help of example:

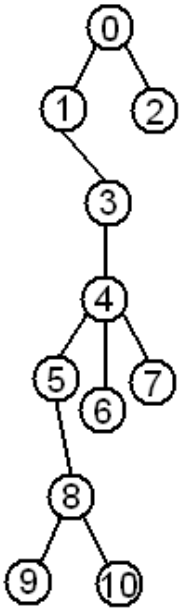
(i) Insertion

(ii) Deletion

(iii) Updation of desired position

OR

(a) Explain the difference between virtual base class and virtual function with the help of example.



2. (a) Explain the following with syntactic rules and example:

(i) Public Inheritance

(ii) Protected Inheritance

(iii) Private Inheritance

(b) Explain the concept of friend function, Write a program to access the private data of a class by non-member function through friend, where the friend function is declared in:

(i) Location of private category

(ii) Within the scope of a class definition.

OR

(a) Write the algorithm to convert infix expressions into postfix expressionsand explain the conversion with the help of a suitable example.

(b) What is dynamic initialization of objects and how can it be achieved? Explain with the help of a suitable example?

3. What is linked representation of stacks? Give an example. Write the algorithm of linked representation of the following stack operations.

(i) Push

(ii) Pop

(iii) Explain dynamic memory allocation in detail.

OR

(a) What is minimal spanning tree? Explain Kruskal algorithm with the help of a suitable example.

(b) Explain the difference between class templates and function templates.

(c) Explain the following file functions with the help of an example.

(i) read()

(ii) write()

(iii) get()

(iv) put()

M.Sc. IT (Part II) Examination, 2013

Computer Oriented Numerical Methods

Part A (Marks: 10)

1. Define percentage error.
2. Define relative error.
3. What is symmetric and skew symmetric matrix?
4. Explain identity matrix.
5. Write formula of Network-Raphson method.
6. Write Weddle Rule.
7. Explain operator δ.
8. Compute the value of $\Delta \log x$.
9. Prove that $\varepsilon = I + \Delta$
10. If A = $\begin{bmatrix} a & b \\ 2 & 3 \end{bmatrix}$ and B = $\begin{bmatrix} 5 & 6 \\ 2 & 3 \end{bmatrix}$

    then find a and b.

Part B (Marks: 10)

1. If A = $\begin{bmatrix} 5 & 6 \\ -1 & 3 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

   then find

   (i) 2A + 3B

   (ii) 3A - 5B
2. Explain Runge Kutta 2nd order and 4th order.
3. Find the value of:

   (i) $E^2 \sin x$

   (ii) $\Delta^2 \log x$

(iii) Prove $I + \Delta = \Delta + I$

(iv) $E^{-1} e^x$

4. Use trapezodial rule and find the value of $\int_0^6 uxdx$

X	0	1	2	3	4	5	6
Ux	.146	.161	.176	.190	.204	.217	.230

5. Find value of

$\Delta^6(ax - 1)(bx^2-1)(cx^3-1)$

Part C (Marks: 60)

1. Use Simpson $\frac{3}{\delta}$ Rule to calculate the value of

$$\int_{.2}^{1.4} e^x \, dx \; h = .1$$

OR

Using fourth order Runge Kutta method solve the differential equation $\frac{dy}{dx} = xy$

where y(1) = 2 on the interval $1 \leq x \leq 1.4$ with h = .2

2. Write notes on the following:

(a) Gauss Forward and Backward Method

(b) Gauss Jacoki and Seidel Method

(c) Regula Falsi Method

(d) Successive Approximation Method

OR

(a) Find root of the equation by iteration method correct upto 3 place of decimal

5x - 2 = sin x

(b) Find root of eqn by Regula Falsi Method

$3x + \sin x - e^x = 0$

3. (a) Euler modified method with h=.1 to find the sol^n of the eqn.

$$\frac{dy}{dx} = x^2 + y^2$$

with y(0) = 0 in the range $0 \leq x \leq .3$

(b) The population of a town in the decennial census were as under. Estimate the population for the year 1925.

Year	x:	1891	1901	1911	1921	1931
Population	y:	46	66	81	93	101

OR

(a) Solve the following by Gauss Seidel Method

$27x + 6y - z = 85$

$6x + 15y + 2z = 72$

$x + y + 54z = 110$

(b) Find inverse of the following and find x, y, z.

$2x + 4y + z = 3$

$3x + 2y - 2z = -2$

$x - y + z = 6$

M.Sc. IT (Part II) Examination, 2013

Programming in Java

Part A (Marks: 10)

1. What is difference between final and finally?
2. Why java does not support multiple inheritance?
3. In System.out.println(). What is System, Out and println().
4. What is meant by abstract interfaces?
5. What is platform?
6. What is package?
7. Can a lock be acquired on a class?
8. What is thread?
9. What is the collection API?
10. What is vector class?

Part B (Marks: 10)

1. How to create multithread in a program?
2. What is synchronization? Why it is important?
3. What is serialization?
4. Why Java does not support pointers?
5. What is the difference between swing and AWT components?

Part C (Marks: 60)

1. (a) Explain the architecture of JDBC. What are the different types of statements available in JDBC?

   (b) Explain in the detail about Java operator and expressions with suitable examples.

OR

(a) Write an algorithm that accept N integer as input and print all odd integers among them as output. Also draw a flowchart.

(b) Mention the use of following libraries in the programming

Java.math
Java.net
Java.applet
Java.awt

2. (a) Write a program in Java that accept a string as input and print the character individually of the string.

(b) What are different access specifier available in Java? Also explain there scope.

OR

(a) Define RMI. Give a simple client server application using RMI.

(b) What is applet? How applet is different than application?

3. With the help of example for each, Write the syntax for the following construct

(a) Do ... while
(b) Switch
(c) For
(d) Explain the exception handling mechanism in detail.

OR

Write short note on (any two):

(a) Polymorphism
(b) Java bean architecture
(c) AWT
(d) CORBA

M.Sc. IT (Part II) Examination, 2013

Artificial Intelligence

Part A (Marks: 10)

1. Define AI.
2. What do you understand by domain in terms of AI?
3. How propositional logic is differ than predicate logic?
4. Explain Bays rule.
5. What is uniformed search?
6. Define knowlefge.
7. How we can write a rule in Prologe?
8. Define certainty factor.
9. What is Fuzzy Logic?
10. Write down the application of an expert system?

Part B (Marks: 10)

1. Explain the role of Universal and Existential quantifiers in Prologe.
2. Describe Resolution principle.
3. Define truth maintenance system.
4. Explain AND-OR graph.
5. Write a short note on circumscription.

Part C (Marks: 60)

1. Define knowledge based system. Explain how knowledge can be acquired manipulated, organized and represented.
2. (a) Explain list in prolog.

   (b) Differentiate between rule order & goal order.

(c) Explain matching in detail.

3. Explain different searching techniques of AI in detail.

M.Sc. IT (Part II) Examination, 2013

Cyber Law, Internet Security

Part A (Marks: 10)

1. What do you mean by SocksProxy?
2. What is Encryption and Decryption?
3. What is IP Security?
4. Define WEB surfing.
5. What is DES?
6. What do you mean by transposition?
7. Write short note on security of MAC.
8. What do you understand by cryptology?
9. What do you mean by cyber-crime?
10. What means a cracker?

Part B (Marks: 10)

1. Explain PKI.
2. What do you understand by hybrid encryption? What is its utility?
3. Write principles of Asymmetric Cytro Systems?
4. Write short note on the following:
   (i) Credit card security
   (ii) E-mail security
5. What do you mean by key recovery attack on block ciphers?

Part C (Marks: 60)

1. What do you mean by firewall? How it work and explain all types of firewalls.

OR

What do you mean by e-commerce? Discuss its advantages and issues which effect e-commerce people, also explain type of e-commerce.

2. Write short note on (any three)

   (a) Virus

   (b) E-mail

   (c) DNS

   (d) Digital Signature

OR

Explain RSA based signature.

3. (a) What do you understand by Cyber Law prevailing in India. What areas have been covered by Indian cyber law?

   (b) Explain digital signature algorithm.

OR

What do you mean by the classification of authentication function in detail?

M.Sc. IT (Part II) Examination, 2013

Software Testing and Quality Assurance

Part A (Marks: 10)

1. Define the need of software testing.
2. What is boundry value testing?
3. A test manager wants to use the resources available for the automated testing of a web application. State the best choice fit for that?
4. What is Beta testing?
5. What is main difference between re-testing and regression testing?
6. Define logic based testing.
7. Define equivalence partitioning.
8. List the components of functional testing.
9. Define use case testing.
10. What is Software Quality Assurance (SQA)?

Part B (Marks: 10)

1. What are the structure based testing techniques?
2. Write down at least one area where following techniques can be used:
   (a) Functionality testing
   (b) Usability testing
   (c) Interface testing
   (d) Compatibility testing
   (e) Performance testing
3. What are the objectives of acceptance testing? Explain different types of acceptance testing.

4. List the advantages of testing. Also discuss significance of unit testing and integration testing with example.

5. Differentiate between white box testing and black box testing.

Part C (Marks: 60)

1. Difference between test plan and test strategy. Do we really need test plan documents?

OR

Write short note on the following:

(a) Levels of testing

(b) Finite state testing

(c) Object Oriented testing

2. Differentiate between the following:

(a) Verification and Validation testing strategies.

(b) Unit testing and Integration testing

(c) Top down and Bottom up testing

3. Describe the following:

(a) Test case design

(b) Test monitoring and control

(c) Test case generators

OR

Web based applications are fast to develop. What type of testing techniques can be used for web based applications? Discuss in detail.