

PURBANCHAL UNIVERSITY

2018

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/ Final
Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24

BCA277CO, Operating System

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1. Explain conditions of deadlock? Discuss detection with one resource of each type.
2. What are different memory management techniques? Discuss fixed size partition method with proper example.
3. Justify why page replacement is required. Discuss LRU and optimal page replacement method with illustrations.

Group B

Answer SIX questions.

6×6=36

4. What is an operating System? Discuss evolution of operating system in detail.
5. Explain different states of process and process implementation with example.
6. What are different methods for getting mutual exclusion. Explain Peterson solution with example.
7. Discuss file types, file access, file attributes with example.
8. Explain banker's algorithm for single resource.
9. Why DMA is needed? Explain the characteristics of DMA with diagram.
10. What is distributed system? Explain the advantages of distribute system over centralizes system
11. Write short notes on any TWO:
(a) Real time operating system.
(b) Disk error handling.
(c) Terminal.



PURBANCHAL UNIVERSITY

2018

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/ Final
Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BCA293MS: Technology and Operations Management

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1. Explain forecasting along with the features. Also compare and contrast the four approaches to judgmental forecasting.
2. Define the concept of locations decisions. Explain different measure of capacity planning and factors affecting location decisions.
3. "Many companies spend significant time, effort and expenses on system, training and organizational changes to improve quality and performance of their process.' In the light of this statement explain the various categories of cost.

Group B

Answer EIGHT questions.

8×7=56

4. What are the various components of information technology?
5. Explain the four successful judgmental methods of forecasting.
6. Define corporate strategies along with its considerations.
7. What are the various types of capacity? Explain.
8. What is market analysis and explain the need assessment in developing operational strategy?
9. Discuss why break even analysis is useful in evaluating the efficiency of a product or process.
10. Explain Economic Order Quantity along with its assumptions.

Contd. ...

PURBANCHAL UNIVERSITY

2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/Final

Time: 03:00 hrs.

Full Marks: 60 /Pass Marks: 24

BCA272CO: Computer Network (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1. What is layer Architecture? Discuss in detail about the layers of OSI model. 12
- 2(a) What is collision? How CSMA/CD works in LAN? 6
- (b) What is CRC? Explain CRC with an example. 6
3. What is subnetting? Classify the IP address on the basis of uses, classes and version. Calculate the maximum number of class A, B and C network Ids. 12

Group B

Answer SIX questions.

6×6=36

4. What are the basic functions of the data link layer? Write down the basic features of HDLC protocol? Could HDLC be used as a data link protocol for a LAN? Justify your answer. 1+5
5. What is wireless Network? Explain WiFi and WiMax. 1+5
6. Differentiate between Link state and Distance Vector Routing algorithm. 6
7. Explain leaky bucket algorithm and compare it with token bucket algorithm. 6
8. Describe and distinguish between FDMA, TDMA, and CDMA. 6
9. Explain the role of a DNS on a computer network. 6
10. Write short notes on any TWO: 2×3=6
(a) OSPF (b) SNMP (c) TCP

(2)

9. What is File Organization? Describe various methods of organizing a file.
10. What do you mean by Quality Assurance? Why is it important that the system you develop should have Quality attributes?
11. Write short notes on any TWO:
 - (a) Structured Chart
 - (b) Cohesion and coupling
 - (c) Distributed system



PURBANCHAL UNIVERSITY

2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/Final

Time: 03:00 hrs.

Full Marks: 60 /Pass Marks: 24

BCA276CO, Database Management System (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1. What is database? How is it different from DBMS? Explain the functions of a DBMS. How does modern database approach is different from traditional file processing system. 2+2+3+5
2. Draw an ER diagram for a School management System. Make additional assumptions required. Also convert the ER diagram into relations.
3. Consider the following DEPARTMENT table given below.

DNO	DNAME	DLOCATION	MANAGER_SSN	MANAGER SALARY
1	Account	Kathmandu	131	30000
2	Finance	Kathmandu	102	30000
3	Marketing	Dharan	103	35000
4	HR	Janakpur	110	35000
5	Production	Janakpur	105	35000
6	Manufacturing	Kathmandu	109	30000

Now answer the following Questions:

- (a) Write SQL syntax to create the given table. The MANAGER_SSN column should refer to the SSN field of EMPLOYEE table.
- (b) Write SQL syntax to update the salary of all the managers by 15% who is either a manager of HR or Production Department.
- (c) Write SQL query to retrieve all information of Departments which is located in Janakpur and whose dname is marketing or HR.

Contd. ...

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PURBANCHAL UNIVERSITY

2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester / Final
Time: 03:00 hrs.

Full Marks: 60 / Pass Marks: 24

BCA277CO, Operating System (New Course)

Candidates are required to give their answers in their own words as far as practicable.

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Group A

Answer TWO questions.

2×12=24

1. Why Page replacement algorithm is required. Discuss LRU and FIFO algorithm with example.
2. What is deadlock? Explain different conditions of deadlock. Discuss Bankers algorithm for single resource with example.
3. What is Disk? Explain different disk scheduling algorithm with example.

Group B

Answer SIX questions.

6×6=36

4. Compare multiprogramming and batch operating systems.
5. Discuss history of operating system in brief.
6. What is Process? Discuss FCFS and Round Robin algorithm with example.
7. Explain different operation performed on a file.
8. What are different types of terminal? Explain.
9. Explain working mechanism of DMA with proper diagram.
10. What is Race condition? Explain with an example.
11. Write short notes on any TWO:
 - (a) Page Fault
 - (b) Segmentation
 - (c) Paging



PURBANCHAL UNIVERSITY

2021

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/Final
Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24

BCA280CO: Numerical Methods

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1(a) Find a root of the equation $x^3 - x - 1 = 0$, using the bisection method correct to three decimal places.

(b) Find by Secant method, the real root of the equation $3x = \cos x + 1$, correct to three decimal places.

2. Fit Power curve to the following data and hence estimate y when x is 5.6.

X:	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Y:	1.2	1.4	1.6	2.2	2.7	3.7	4.1

3. Solve the equations $27x + 6y - z = 85$, $6x + 15y + 2z = 72$ and $x + y + 54z = 110$ by Gauss siedel iterative method.

Group B

Answer SIX questions.

6×6=36

4. By method of least squares, find the straight line that best fits the following data.

X:	1	2	3	4	5
Y:	10	25	42	56	68

5. From the following table, find y when $x = 4.8$ by Newton's interpolation formula:

x	: 1.7	1.8	1.9	2.0	2.1	2.2	2.3
y = e ^x	: 5.474	6.050	6.686	7.389	8.166	9.025	9.974

6. Given that:

x:	1.0	1.1	1.2	1.3	1.4	1.5
y:	7.989	8.403	8.781	9.129	9.451	9.750

Find first derivative at $x = 1.2$

Contd. ...

PURBANCHAL UNIVERSITY

2021

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/Final
Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24

BCA280CO: Numerical Methods

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Group A

Answer TWO questions.

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Find first derivative at $x = 1.2$

Contd. ...

(2)

7. Use Simpson's method to compute $\int_0^1 \frac{dx}{1+x}$ correct to three decimal places.

8. Using Euler's method, find an approximate value of y corresponding to $x=1$, given that $dy/dx = x^2 + y^2$ and $y=1$ when $x=0$. Use $h=0.2$.

9. Find Polynomial $f(x)$ by using Lagrange's formula and hence find $f(3)$ for

x	0	1	3	5
$f(x)$	2	7	12	80

10. Discuss the scope of numerical methods in the field of information.

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BCA280CO: Numerical Methods

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Group A

Answer TWO questions.

2×12=24

1. Fit a geometric curve $y = ax^b$ to the following data. 12

x	2	4	6	8
y	1.4	2.0	2.4	2.6

2. What are the linear equations? Explain with examples. Solve the following systems of equations by Gauss-Jordan method. 3+9

$$x_1 + 2x_2 - 3x_3 = 4$$

$$2x_1 + 4x_2 - 6x_3 = 8$$

$$x_1 - 2x_2 + 5x_3 = 4$$

3. Find d^2y/dx^2 at $x=0.1$ from the following table. 12

x	0.0	1.0	2.0	3.0	4.0
y	1.0000	0.9975	0.9900	0.9976	0.9604

Group B

Answer SIX questions.

6×6=36

4. What do you mean by numerical methods? Describe about different types of errors occurred in numerical computing. 2+4
5. Find the positive root of $x^3 - x - 1 = 0$, correct to two decimal places by bisection method. 6
6. Find the root of the equation $f(x) = x^2 - 3x + 2$ using Bisection method. Use $x_1 = 0$. 6
7. What is interpolation? Find the Lagrange interpolation which agrees with the following data: 1+5

x	1.0	1.1	1.2
cos x	0.5403	0.4536	0.3624

Use it to estimate $\cos 1.15$.

Contd. ...

(2)

8. Solve the system

$$3x_1 + 2x_2 + x_3 = 10$$

$$2x_1 + 3x_2 + 2x_3 = 14$$

$$x_1 + 2x_2 + 3x_3 = 14$$

by using Factorization method.

9. Evaluate $\int_0^1 \frac{dx}{1+x}$ using Simpson's 1/3 rule. Also estimate the value of \ln^2 . 6

10. Using Euler's method, find the value of $y(0.2)$ and $y(0.3)$. Given $dy/dx = 2y$ and $y(0) = 1$, Take $h = 0.1$. 6

11. Use 4th order Runge-Kutta method to find out the value of $y(0.3)$. Given $dy/dx = x+y$, $y(0) = 3$ and $h = 0.3$. 6

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BCA280CO: Numerical Methods

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y	1.0000	0.9975	0.9900	0.9976	0.9604

Group B

Answer SIX questions.

6×6=36

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5. Find the positive root of $x^3 - x - 1 = 0$, correct to two decimal places by bisection method. 6

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x	1.0	1.1	1.2
cosx	0.5403	0.4536	0.3624

Use it to estimate $\cos 1.15$.

Contd. ...

$$x=1.2 \quad y = 0.3624$$

(2)

8/ Solve the system 6

$$3x_1 + 2x_2 + x_3 = 10$$

$$2x_1 + 3x_2 + 2x_3 = 14$$

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9. Evaluate $\int_0^1 \frac{dx}{1+x}$ using Simpson's 1/3 rule. Also estimate the value of \ln^2 . 6

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2018

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BCA277CO, Operating System

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Group A

Answer TWO questions.

2×12=24

1. Explain conditions of deadlock? Discuss detection with one resource of each type.
2. What are different memory management techniques? Discuss fixed size partition method with proper example.
- 3/ Justify why page replacement is required. Discuss LRU and optimal page replacement method with illustrations.

Group B

Answer SIX questions.

6×6=36

- 4/ What is an operating System? Discuss evolution of operating system in detail.
5. Explain different states of process and process implementation with example.
6. What are different methods for getting mutual exclusion. Explain Peterson solution with example.
- 7/ Discuss file types, file access, file attributes with example.
- 8/ Explain banker's algorithm for single resource.
- 9/ Why DMA is needed? Explain the characteristics of DMA with diagram.
10. What is distributed system? Explain the advantages of distribute system over centralizes system
- 11/ Write short notes on any TWO:
(a) Real time operating system.
(b) Disk error handling.
(c) Terminal.



PURBANCHAL UNIVERSITY

2019

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/Final Time: 03:00 hrs. Full Marks: 60 /Pass Marks: 24

BCA276CO: Database Management System

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2x12=24

1/ Read the following case about a Hospital carefully and draw an ER diagram. Also convert the ER diagram into relations. 8+4

A general hospital consists of a number of specialized wards (such as Radiology, Oncology etc.). Information about ward includes unique name, total number of current patients. Each ward hosts a number of patients, who were admitted by a consultant (doctors) employed by the Hospital. On admission, the date and time are recorded. The personal details of every patient includes name, Medical Record Number (MRN), set of phone and one address (city, street, code). A separate register is to be held to store the information of the tests undertaken. Each test has unique episode no, category and the final result of the test. Number of the test may be conducted for each patient. Doctors are specialists in a specific ward and may be leading consultants for a number of patients. Each patient is assigned to one leading consultant but may be examined by other doctors if required.

2/ How does database differ from database management system? Explain the characteristics of modern database system that differentiate it from traditional file processing system. What do you mean by data independence: 4+6+2

3(a) What is SQL? Explain the different parts of SQL. 2+4

(b) Create the Table CUSTOMER with following Information. 3

Column Name	Type	Width	Constraints
Customer ID	Number	4	Primary key
Customer Name	Varchar	20	Not null
Customer City	Character	3	Must be 'Ktm', 'Bri'

Also write SQL syntax for the following: 1+1+1

Contd. ...

diagram. Explain the characteristics of DMA with

(2)

- (a) Write a query to display all customer record that belongs to Biratnagar.
- (b) Write sql query to display all the records of the customer whose name starts with letter 'A'.
- (c) Write sql query to count the total number of records in the given table.

Group B

Answer SIX questions.

6×6=36

- 4/ Explain how integrity constraints help in securing a database. 6
5. What are the methods of executing a transaction? Explain dirty read and incorrect summary problem. 2+4
- 6/ What are integrity constraints? Why are they important? Explain its types. 2+2+2
- 7/ How does functional dependency differ from multi-valued dependency? Explain 3NF with an example. 2+4
- 8/ Explain different methods of database recovery. 6
9. How does PL/SQL differ from SQL? Write a PL/SQL program to display all the records of a student table when a student number is input through the keyboard. 2+4
10. How database view can be created? Explain with an example. 6
- 11/ What is the importance of database security? Explain discretionary and mandatory security mechanism. 2+4
- 12/ Write short notes on any TWO: 2×3=6
 - (i) Foreign key
 - (ii) Project operation
 - (iii) Deadlock prevention

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PURBANCHAL UNIVERSITY

2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester/Final
Time: 03:00 hrs. Full Marks: 60 / Pass Marks: 24

BCA280CO: Numerical Methods (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

- 1(a) Find the positive root of the equation $x^3 - x - 1 = 0$, by bisection method, correct to two decimal places.
- (b) Find to four places of decimal, the root of the equation $e^x = \sin x$, by Newton-Raphson method.
2. Solve by Gauss-Seidal method, the following system of equations, $5x_1 + 2x_2 + x_3 = 12$, $x_1 + 4x_2 + 2x_3 = 15$, $x_1 + 2x_2 + 5x_3 = 20$, correct upto three decimal places. 2 3
3. Apply Runge-Kutta fourth order method to find the solution of differential equation $dy/dx = x^2 + y^2$, at $x = 1.2$ in steps of 0.1, given that $y = 1.5$ when $x = 1$. 2.505

Group B

Answer SIX questions.

6×6=36

4. Determine the constants a and b by the method of least square such that $y = ae^{bx}$ fits the following data:

x:	2	4	6	8	10
f:	4.007	11.084	30.128	81.897	222.62

$a = 0.3914$
 $b = 0.5017$

5. The population of a country in decennial census were as under:

Year	1941	1951	1961	1971	1981
Population (millions)	46	67	83	95	102

Find the population for 1975 year. 97.8

6. The following table gives the value x and y :

x	1.2	2.1	2.8	4.1
y	4.2	6.8	9.8	13.4

-2.48

Find the lagrange interpolation polynomial and hence $y(10)$.

Contd. ...

(2)

- (d) Write SQL query to find the total salary of all the departments which are located in Kathmandu.
- (e) Write a DDL command to insert a new column named 'email' to the department table.

Group B

6×6=36

Answer SIX questions.

4. List the functions of a DBMS. How can you classify DBMS? 2+4
5. What is multivalued dependency? Explain 3NF and BCNF with example. 1+5
6. What are integrity constraints? How does domain constraint differ from referential integrity constraints? 2+4
7. What is relational algebra? Differentiate between SELECT and PROJECT operation used in relational algebra. 1+5
8. What does the DBMS do to recover from failures? Explain. 6
9. How can you differentiate between DML and DDL? Explain with proper syntax for each command. 6
10. Write short notes on any TWO: 3+3
- (a) Query Processing
- (b) Data Independence
- (c) Participation constraints

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2017

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BCA276CO, Database Management System (New Course)

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Group A

Answer TWO questions.

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2. Draw an ER diagram for a School management System. Make additional assumptions required. Also convert the ER diagram into relations.
3. Consider the following DEPARTMENT table given below.

DNO	DNAME	DLOCATION	MANAGER_SSN	MANAGER SALARY
1	Account	Kathmandu	131	30000
2	Finance	Kathmandu	102	30000
3	Marketing	Dharan	103	35000
4	HR	Janakpur	110	35000
5	Production	Janakpur	105	35000
6	Manufacturing	Kathmandu	109	30000

Now answer the following Questions:

- (a) Write SQL syntax to create the given table. The MANAGER_SSN column should refer to the SSN field of EMPLOYEE table.
- (b) Write SQL syntax to update the salary of all the managers by 15% who is either a manager of 'HR or Production Department.
- (c) Write SQL query to retrieve all information of Departments which is located in Janakpur and whose dname is marketing or HR.

Contd. ...

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2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester / Final
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Answer TWO questions.

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2. What is deadlock? Explain different conditions of deadlock. Discuss Bankers algorithm for single resource with example.
3. What is Disk? Explain different disk scheduling algorithm with example.

Group B

6×6=36

Answer SIX questions.

4. Compare multiprogramming and batch operating systems.
5. Discuss history of operating system in brief.
6. What is Process? Discuss FCFS and Round Robin algorithm with example.
7. Explain different operation performed on a file.
8. What are different types of terminal? Explain.
9. Explain working mechanism of DMA with proper diagram.
10. What is Race condition? Explain with an example.
11. Write short notes on any TWO:
 - (a) Page Fault
 - (b) Segmentation
 - (c) Paging



(2)

8. Define the concept of forecasting. How can it be used in production and operations management system?
9. What is material requirement planning? What are the inputs to material requirement planning?
10. Define the concept of Process Management. Explain process choice, resource flexibility and capital intensity in brief.
11. Each year the Redstone Company purchases 20000 of an item that costs Rs. 16 per unit. The cost of placing an order is Rs. 12 and the cost of hold the item for one year is 24% of the unit cost. Determine the economic order quantity and the average inventory level and number of order in a year, assuming that the minimum inventory level is zero
12. Write short notes on any TWO:
 - (a) QQM
 - (b) Market analysis
 - (c) JIT
 - (d) Resource flexibility

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PURBANCHAL UNIVERSITY

2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester / Final
Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BCA293MS: Technology and Operations Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

2×12=24

Answer TWO questions.

1. Discuss the concept of operations management. Describe major differences and similarities between the manufacturing operations and service operations management.
2. Define the quality circle. Discuss how the quality circle is used as a technique of quality improvement.
3. Suggest suitable locations for the following industries and what are the key factors to be considered.
 - Sugar factory
 - Textile industry
 - Auto part unit
 - Food processing unit

Group B

Answer SEVEN questions.

7×8=56

4. Discuss the meaning and role of technology. What are the different components of technology? Explain.
5. What type of strategic plans are necessary for a shoe maker to make? Explain.
6. What is conversion process? Define the importance of job design in conversion process.
7. What do you understand by the cost of poor quality? Explain with suitable examples.

Contd. ...

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PURBANCHAL UNIVERSITY

2017

4 Years Bachelor of Computer Application (BCA)/Fourth Semester / Final
Time: 03:00 hrs. Full Marks: 60 / Pass Marks: 24

BCA272CO: Computer Network (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1. What is layer Architecture? Discuss in detail about the layers of OSI model. 12
- 2(a) What is collision? How CSMA/CD works in LAN? 6
- (b) What is CRC? Explain CRC with an example. 6
3. What is subnetting? Classify the IP address on the basis of uses, classes and version. Calculate the maximum number of class A, B and C network Ids. 12

Group B

Answer SIX questions.

6×6=36

4. What are the basic functions of the data link layer? Write down the basic features of HDLC protocol? Could HDLC be used as a data link protocol for a LAN? Justify your answer. 1+5
5. What is wireless Network? Explain WiFi and WiMax. 1+5
6. Differentiate between Link state and Distance Vector Routing algorithm. 6
7. Explain leaky bucket algorithm and compare it with token bucket algorithm. 6
8. Describe and distinguish between FDMA, TDMA, and CDMA. 6
9. Explain the role of a DNS on a computer network. 6
10. Write short notes on any TWO: 2×3=6
(a) OSPF (b) SNMP (c) TCP



(2)

9. What is File Organization? Describe various methods of organizing a file.
10. What do you mean by Quality Assurance? Why is it important that the system you develop should have Quality attributes?
11. Write short notes on any TWO:
- (a) Structured Chart
 - (b) Cohesion and coupling
 - (c) Distributed system

