

T.Y.B.Sc (Computer Science)
Data Communication, Networking and Security
APRIL: - 2016

QP Code : 16862

(3 Hours)

[Total Marks:100]

- N.B: (1) All questions are compulsory.
(2) Figures to the right indicate marks.
(3) Illustrations, in-depth answers and diagrams will be appreciated.
(4) Mixing of sub-questions is not allowed.

- Q1. Attempt the following (any FOUR): (20)**
- (A) Explain with an example circuit switched network
 - (B) Differentiate between classful and classless addresses of IPV4 .
 - (C) Write a short note on QoS.
 - (D) Discuss intrusion detection techniques.
 - (E) What are modems? How do they work?
 - (F) How electronic mail is transferred from sender to receiver.
- Q2. Attempt the following (any FOUR): (20)**
- (A) Discuss different components of data communication.
 - (B) State and explain in brief, layers of OSI model.
 - (C) Write a short note on transmission impairments.
 - (D) What are transmission modes? Explain serial transmission in detail.
 - (E) How FDM helps in sending more data at one time?
 - (F) Write a short note on coaxial cable.
- Q3. Attempt the following (any FOUR): (20)**
- (A) How error detection and error correction works?
 - (B) Explain with an example working of stop-and-wait protocol.
 - (C) How CSMA works?
 - (D) Discuss the MAC frame format.
 - (E) What is hidden terminal problem?
 - (F) Write a short note on repeaters.
- Q4. Attempt the following (any FOUR): (20)**
- (A) Discuss different transition techniques from IPV4 to IPV6.
 - (B) Write a short note on DHCP.
 - (C) Explain digital signature.
 - (D) Write a short note on UDP.
 - (E) What is name space? Explain DNS with example.
 - (F) To transfer a file, how FTP works?
- Q5. Attempt the following (any FOUR): (20)**
- (A) What is cipher? Discuss substitution cipher with example.
 - (B) Define DES. With neat labeled diagram, discuss general structure of DES.
 - (C) List and explain limitations of firewall.
 - (D) Describe a denial of service attack.
 - (E) Write a short note on hacking.
 - (F) Discuss the working of IPSec.

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(4) Mixing of sub-questions is not allowed.

- Q1. **Attempt the following (any FOUR):** (20)
(A) Write a short note on features of JFC.
(B) Write a short note on life cycle of a Thread.
(C) Differentiate between Generic Servlet and Http Servlet.
(D) Explain the use of (i) @WebMethod (ii) @WebParam.
(E) What is the use of JTabbedPane? How to create it?
(F) Write a short note on JAX-WS technology.
- Q2. **Attempt the following (any FOUR):** (20)
(A) Explain any five of Text-Entry components.
(B) How to create a table in Swing? Explain with programming example.
(C) How to create a JTree? Explain with code snippet.
(D) Explain PreparedStatement with code snippet.
(E) Write a Java program to accept login id and password field. On clicking of the button, the entered login id and password should be displayed in a text area.
(F) Write a JDBC program to create a table 'product' for the database 'productdb' to enter fields - productid, description, rate and quantity. Take suitable data type for each field. Also insert a record in that table.
- Q3. **Attempt the following (any FOUR):** (20)
(A) How a Thread can be created using Runnable interface? Explain with the programming example.
(B) State and describe the methods used for Inter Thread Communication.
(C) Explain the role of following classes with any of its two methods:
i) Socket, ii) ServerSocket
(D) Explain the mechanism by which server and client can communicate with each other and pass information back and forth using RMI.
(E) Write a Java program that displays the information about a file URL like its type, encoding, port number, protocol and length.
(F) Write a remote interface containing a function factorial. Write a class that implements this interface to find factorial of that number.
- Q4. **Attempt the following (any FOUR):** (20)
(A) What is the role of HttpServletRequest and HttpServletResponse? State any two methods of these interfaces.
(B) What is session tracking? How cookies are helpful for Session tracking?

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- (C) What is JSP? List and Explain any four advantages of using JSP over servlets.
- (D) Explain page directive with any of its four attributes.
- (E) Write a Servlet which allows user to add new records to table unmpwd. Values for username and password are passed through HTML. Also write the code for HTML document.
- (F) Write a Java Server Page to accept a number sent from an HTML file and finds square of all numbers from 1 to n. Also write the code for HTML document.

Q5. Attempt the following (any FOUR): (20)

- (A) Write a short note on benefits of EJB.
 - (B) Explain the life cycle of stateful session bean.
 - (C) What is message listener? Also explain onMessage() method.
 - (D) Write and explain any two annotations used for developing EJB.
 - (E) What are various ways of passing parameters in EJB?
 - (F) What factors should be considered before giving local or remote access to beans?
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T.Y.B.Sc (Computer Science)
Operating Systems and Linux
April: - 2016

QP Code : 16950

(3 Hours)

[Total Marks:100]

- N.B: (1) All questions are compulsory.
(2) Figures to the right indicate marks.
(3) Illustrations, in-depth answers and diagrams will be appreciated.
(4) Mixing of sub-questions is not allowed.
(5) Assume suitable data is required.

Q1. Attempt the following (any FOUR): (20)

- (A) Define critical section and critical section problem. Describe the structure of critical section.
(B) Assume there are total 200 tracks are present on each surface of the disk (0 to 199). If request queue is 10, 90, 130, 30, 185 and initial position of the head is 40. Apply SSTF and FCFS disk scheduling and calculate total head movements.
(C) What is the difference between \$@ and \$*?
(D) Explain Boot block and Data block of Linux File System.
(E) Write a short note on Direct Memory Access (DMA).
(F) Write any 5 openSSH components.

Q2. Attempt the following (any FOUR): (20)

- (A) Explain the following types of operating systems:
i) Time sharing
ii) Real time
(B) Discuss the activities of operating system regarding:
i) Process Management
ii) File Management
(C) Diagrammatically explain Layered approach in operating system structure.
(D) Describe 5 state process model with a neat diagram.
(E) Define thread. Explain user and kernel thread.
(F) Consider the following set of processes with the length of CPU burst time and arrival time given in milliseconds. Illustrate the execution of the processes using Round Robin algorithm. Draw Gantt Chart. Also calculate average waiting time and turnaround time. Time Quantum = 3 ms.

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

Q3. Attempt the following (any FOUR): (20)

- (A) Diagrammatically explain Dining philosopher's problem.
(B) Define Banker's algorithm. Explain its 4 data structures.
(C) For the following page reference string calculate total number of page faults with FIFO and Optimal page replacement algorithm with frame size=3
Reference string = 1,2,3,4,2,1,3,1,4,2,3,2
(D) Discuss free space management techniques of file system.

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- (E) Explain the concept of security with respect to following terms:
 - i) Encryption
 - ii) Decryption
 - iii) Public key
 - iv) Cipher text
 - v) Plain text
- (F) Describe with a neat diagram, steps in handling page faults.

Q4. Attempt the following (any FOUR): (20)

- (A) Explain the use of following Linux Directories :
 - i) /bin
 - ii) /dev
 - iii) /media
 - iv) /tmp
 - v) /root
- (B) Explain sort and uniq commands along with any two options of each command.
- (C) Write a short note on Environment Variable.
- (D) Discuss chmod command.
- (E) Explain the following redirection symbols with example:
 - i) | (pipe)
 - ii) <
 - iii) <<
 - iv) >
 - v) >>
- (F) Write the use and syntax of case statement along with example.

Q5. Attempt the following (any FOUR): (20)

- (A) Write a short note on standard file descriptors.
- (B) Can we use file descriptor 4 as an output file descriptor? Justify your answer.
- (C) Explain the following job scheduling commands
 - i) at
 - ii) batch
- (D) Write any 5 administrator's privileges.
- (E) Discuss Berkley r-utilities.
- (F) Explain the following iptables :
 - i) Filter table
 - ii) NAT table
 - iii) Mangle table

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(3) Illustrations, in-depth answers and diagrams will be appreciated.
(4) Mixing of sub-questions is not allowed.

- Q1. Write a short note on (any FOUR): (20)**
- (A) Properties of Decomposition
 - (B) Thomas Write rule.
 - (C) Deadlock
 - (D) Steps in Unified Process
 - (E) CMM
 - (F) CK Metrics suite.
- Q2. Attempt the following (any FOUR): (20)**
- (A) Explain role of Armstrong's axioms in closure of a set of FDs.
 - (B) Discuss anomalies associated with interleaved transactions.
 - (C) State and explain conditions needed to be satisfied by two schedules to become view equivalent of each other.
 - (D) Describe ARIES algorithm.
 - (E) Explain conflict equivalent and conflict serializable.
 - (F) Define and Elaborate following terms related to log file: log tail, log sequence number, pageLSN.
- Q3. Attempt the following (any FOUR): (20)**
- (A) Define explicit cursor with cursor attributes.
 - (B) Explain the purpose of GOTO statements in PL/SQL block with appropriate example.
 - (C) Explain EXIT statements with example. State and explain need of exit statement.
 - (D) Describe the use of %ROWTYPE and %TYPE in PL/SQL.
 - (E) State relational operators. Explain any three in brief.
 - (F) Write a short note on system catalog.
- Q4. Attempt the following (any FOUR): (20)**
- (A) List out and explain different activities performed in project management process.
 - (B) State need of WBS. Explain WBS with suitable illustration.
 - (C) Describe COCOMO model.
 - (D) State practices of Agile development.
 - (E) State and explain the characteristics of metrics for object oriented design.
 - (F) Explain the concept of LOC with examples.
- Q5. Attempt the following (any FOUR): (20)**
- (A) Describe Integration testing in detail.
 - (B) Define testing. State importance of testing.
 - (C) Discuss quality assurance in context with Six sigma.
 - (D) Discuss Advantages and disadvantages of white box testing.
 - (E) What is Test Plan? Discuss the contents of the test plan.
 - (F) Write a short note on web site testing.