

**T.Y.B.Sc (Computer Science)**  
**Data Communication,**  
**Networking and Security**  
**April - 2015**

**Q.P. Code : 50470**

(3 Hours)

[ Total Marks : 100

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

- Q1. Write short notes (any four):** 20
- (A) Bus Topology  
 (B) Transmission impairments  
 (C) Network connecting devices  
 (D) DNS  
 (E) ADSL  
 (F) Firewall
- Q2. Attempt the following (any FOUR):** 20
- (A) Discuss the characteristics of digital signal.  
 (B) What is mB/nB coding? Explain with example.  
 (C) Explain concept of WDM with neat diagram. Also give its application.  
 (D) Explain the need of multistage crossbar switch with example.  
 (E) Consider the signal carries data 11010011, draw timing diagram for both NRZ & explain difference between them.  
 (F) Explain twisted pair cable with its types.
- Q3. Attempt the following (any FOUR):** 20
- (A) Explain checksum method of error handling with suitable example.  
 (B) What is CSMA? explain working of CSMA/CA.  
 (C) How selective repeat ARQ differs from Go-Back-n ARQ?  
 (D) Write a note on transparent bridge.  
 (E) State & describe the classes in classfull addressing. With reason state the classes of following addresses : a) 19.22.100.10 b) 253.9.1.201  
 (F) Discuss the modes in HDLC. Also state types of frames in HDLC.
- Q4. Attempt the following (any FOUR):** 20
- (A) What is the role of RARP & BOOTP?  
 (B) What are the advantages of IPv6 over IPv4.  
 (C) Write in brief about phases of TCP connection.  
 (D) With respect to routing define forwarding & state the forwarding techniques used.  
 (E) Write a note on congestion control.  
 (F) What is the role of SMTP & HTTP?
- Q5. Attempt the following (any FOUR):** 20
- (A) Discuss the types of attacks on network system.  
 (B) State & explain security mechanisms related to data confidentiality & integrity.  
 (C) Write a note on security associations.  
 (D) Write in brief about digital signature.  
 (E) Encode message 'ARE WE SECURE' using additive cipher with key 7.  
 (F) Discuss the types of intruders.

**(3 Hours)**

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1. Write short notes on (any four): 20  
(a) Features of JFC  
(b) JFrame  
(c) URLConnection  
(d) HttpSession  
(e) Life cycle of a Servlet  
(f) Benefits of EJB
2. Attempt the following (any four): 20  
(a) Explain with suitable examples how to create menus in swing.  
(b) Explain different types of Text-Entry components.  
(c) What is the use of JTabbedPane? How to create it? Explain with programming example.  
(d) Write a short note on any two drivers of JDBC.  
(e) Write a Swing program containing a button with the caption "Now" and a text field.  
On click of the button current date and time should be displayed in the text field.  
(f) Write a JDBC program that accepts a table name and displays total number of records present in it.
3. Attempt the following (any four): 20  
(a) Explain life cycle of a Thread.  
(b) Explain the steps to execute an RMI program.  
(c) What is the significance of URL? How it is used?  
(d) Explain the following classes with code snippet.  
i) InetAddress, ii) URLConnection  
(e) Explain the term Marshalling and Unmarshalling. What are the advantages of RMI?  
(f) Write a TCP server program that returns factorial of a given integer number to a TCP client.
4. Attempt the following (any four): 20  
(a) What is the role of ServletContext and HttpServletRequest? State some important methods of these classes.  
(b) Differentiate between cookies and session.  
(c) Explain error handling mechanism in JSP with code snippet.  
(d) Write a Java Server Page which displays value of m to the power of n ( $m^n$ ) where m and n are accepted from numbers.html.  
(e) Write a Servlet which accepts ROLLNO, NAME and YEAR sent from a HTML document (student.html) and display them on screen. Also give the code for student.html document.  
(f) Write a program using JSP tags to compute square of numbers from 1 to 20.

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5. Attempt the following (any four):

20

- (a) State and explain any two annotations used for developing EJB.
- (b) Explain the life cycle of stateless session bean.
- (c) What is message listener? Also explain onMessage() function.
- (d) What are various ways of passing parameters in EJB?
- (e) Write a short note on JAX-WS.
- (f) Write a web service method that accepts a number n and returns the value of  $1+2+3+\dots+n$ .

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- Q1. **Write Short Notes on (any FOUR):** (20)
- (A) OS services
  - (B) Five state process model.
  - (C) Environment Variables
  - (D) awk command.
  - (E) Direct Memory Access
  - (F) Virus & types of virus
- Q2. **Attempt the following (any FOUR):** (20)
- (A) Explain in brief FCFS scheduling algorithm with suitable example.
  - (B) List and explain various components of PCB.
  - (C) Write a short note on Semaphore with respect to definition , signal() and wait() operations .
  - (D) Explain one to one, many to many, one to many threading models.
  - (E) Discuss the terms Schedulers, long term and short term scheduler.
  - (F) State Producer-Consumer Problem. Develop pseudo -code for the same.
- Q3. **Attempt the following (any FOUR):** (20)
- (A) Obtain a solution for Dining Philosophers Problem using Monitors.
  - (B) Discuss First Fit and Worst Fit Techniques with respect to memory management. [Use necessary diagrams to explain the concepts.]
  - (C) Note various data structures used in Bankers Algorithm.
  - (D) Explain the concept of security with respect to following terms: encryption, decryption, public key, cipher text and plain text.
  - (E) Explain in brief a page replacement algorithm LRU and give one example with frame size 4.
  - (F) Define following :
    - 1)rotational latency
    - 2)seek time
    - 3) transfer time
    - 4) swapping
    - 5) fragmentation
- Q4. **Attempt the following (any FOUR):** (20)
- (A) What do you mean by hard link and soft link? Demonstrate the same with suitable example.
  - (B) Define the term Variable. State the rules for writing variables in Linux and explain PS1 and PS2.
  - (C) Write the features of Linux.
  - (D) Explain -t , -s options of read command with suitable example.
  - (E) Demonstrate -n, -c, -r, -k and -f options of sort command.
  - (F) Write a shell script to accept a number with the help of command line parameter and find factorial of the same.

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Q5.

**Attempt the following (any FOUR):**

(20)

- (A) Explain in detail various duties that system administrator needs to perform.
  - (B) Write a note on startup and shutdown process in linux.
  - (C) Explain the standard file descriptors.
  - (D) Discuss in two -three lines various job scheduling commands.
  - (E) Demonstrate how one can execute a process at background? What is the purpose of "?" variable?
  - (F) Explain following with respect to sed:
    - 1) The Substitute Command
    - 2) How to transform a character into another one.
    - 3) How to perform global changes
    - 4) How to delete a specific line from a file?
    - 5) How to print line numbers.
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**T.Y.B.Sc (Computer Science)**  
**DBMS II & Software**  
**Engineering**  
**April - 2015**

**Q.P. Code : 15120**

**(3 Hours)**

**[ Total Marks : 100**

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**Q1. 20**

**Write a Short Note on (any FOUR)**

- (A) ACID Properties
- (B) Deadlock
- (C) General Attributes of Software Metrics
- (D) Sequences
- (E) Types of Cursors
- (F) Steps in Unified Process

**Q2. 20**

**Attempt the following (any FOUR):**

- (A) State the properties of decomposition. Explain any 1.
- (B) What is the role of transaction manager?
- (C) Explain the concept of Compensation Log Record.
- (D) List and explain the transaction control properties.
- (E) With respect to schedule define terms: Conflict equivalent and Conflict Serializable
- (F) Explain the three steps of checkpointing.

**Q3. 20**

**Attempt the following (any FOUR):**

- (A) Define explicit cursor along with cursor attributes.
- (B) Elaborate on the system catalog with its structure.
- (C) State various relational operators and explain any 3.
- (D) Explain the role of exit statement in loops of PL/SQL.
- (E) State the syntax of parameterized cursor by giving an appropriate example.
- (F) Write a PL/SQL block to execute the operation as either D(Debit) or C(Credit) for acct\_details(acctno,balance,updt\_bal). Accept the transaction\_amount from the user. If the operation is Credit then add the transaction\_amount into the balance and show the updated balance for specific acctno from table. If the operation is Debit then subtract the transaction\_amount from the balance and show the updated balance for specific acctno from table. Show the updated balance in the table under updt\_bal.

**[ TURN OVER**

**Q.P. Code : 15120**

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

20

- (A) Discuss the roles of project manager.
- (B) List all the steps in Capability Maturity Model along with explanation.
- (C) What is risk management? Explain the activities involved in it.
- (D) Comment on the following statement – “Estimation using Use Case is problematic”
- (E) Describe the COCOMO model.
- (F) Write down the formulae for UFP(Unadjusted Function Point), CAF( complexity adjustment factor) and DFP(Delivered Function Point) by stating any 4 environmental complexity factors.

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

20

- (A) With respect to testing define the following – mutant, Error, Test Case, Test Bed, Test
- (B) Discuss Principles of Static Testing.
- (C) Discuss Software Quality Assurance in context with Six Sigma.
- (D) Explain how unit testing is different from integration testing.
- (E) Discuss the contents of the Test Plan.
- (F) Define cyclomatic complexity and find out cyclomatic complexity for the following diagram using any two formulae for calculating V(G).

