

# T.Y.B.SC. (Comp. Science)

## Data Communication, Networking and Security

(May-2017)

Q.P.Code: 08940

[Total Marks: 100]

### Q1. Answer any four

- (A) Explain Synchronous Time division multiplexing.
- (B) Explain circuit switched networks with the help of a neat diagram.
- (C) Explain how checksum is calculated on the internet.
- (D) Find the hamming distance between the following.  
1)(00000,01011) 2)(01011,10101)
- (E) Explain additive cipher with an example.
- (F) What are the advantages of IPv6 over IPv4?

(20)

### Q2. Answer any four

- (A) Explain the characteristics of a periodic sine wave.
- (B) Encode the bit sequence 01001110 using polar NRZ-L and NRZ -I.
- (C) How is Wavelength Division Multiplexing used to combine optical signals.
- (D) What are the applications of fibre optic cables? What are their advantages and disadvantages?
- (E) Explain any two strategies used to achieve data rate management in Time division multiplexing.
- (F) Explain the structure of a packet switch.

(20)

### Q3. Answer any four

- (A) Explain the structure of an encoder and decoder used with hamming codes.
- (B) Explain the stop and wait ARQ protocol.
- (C) Explain the format of a PPP frame?
- (D) Explain the concept of VLAN with an example.
- (E) Write a short notes on classless addressing.
- (F) What is a repeater? What is its use in a LAN?

(20)

### Q4. Answer any four

- (A) Explain IPv4 datagram format.
- (B) Explain DHCP protocol.
- (C) Write short notes on Routing information protocol.
- (D) Explain any two open loop congestion control policies.
- (E) What is a resolver? Explain recursive resolution.
- (F) Explain how routing tables are initialised in distance vector routing.

(20)

### Q5. Answer any four

- (A) What is a digital signature? What are the services offered by digital signatures?
- (B) What is a Firewall? What are its limitations?
- (C) What are the different types of intruders? What are the types of IDS.
- (D) Explain the concept of asymmetric key cryptography with a neat diagram.
- (E) What is a virus? What are the different types of viruses.
- (F) Explain the general structure of DES.

(20)

**(3 Hours)****[Total Marks 100]**

- Note :
1. All the questions are compulsory
  2. Figures to right indicate full marks
  3. Draw suitable diagrams wherever necessary.
  4. Mixing of sub questions are not allowed

**Que 1 Attempt any following ( Any Four) [20]**

- a) Explain System calls in operating system and different types of system calls.
- b) What kind of information can be associated with a particular process in PCB (Process control block).
- c) Explain following terms in brief
  - 1) Swapping 2) Compaction 3) demand paging
- d) Explain Linux File system in detail.
- e) Write a short note on ftp.
- f) Explain how to create link between two files and directories in Linux.

**Que 2 Attempt any following ( Any Four) [20]**

- a) Discuss the activities of operating system in regards to File management and I/O Management.
- b) Explain in brief 1) Time sharing operating system 2) Real time operating system
- c) Explain long term, Medium term and short term schedulers.
- d) Explain SJF and Round Robin algorithm with suitable example.
- e) What is process, Explain two state and five state process Model.
- f) Elaborate on two-process solution for critical section problem.

**Que 3 Attempt any following ( Any Four) [20]**

- a) Describe the two basic communication models 1) shared memory 2) message passing system.
- b) Describe deadlock recovery techniques.
- c) Diagrammatically step wise explain the concept of page fault handling.
- d) Explain critical section with binary and counting semaphore solutions.
- e) Write an algorithm using bounded buffer which will prove the synchronization between producer and consumer problem.
- f) Explain SCAN and C-SCAN algorithm of operating system.

**Que 4 Attempt any following ( Any Four) [20]**

- a) What is Linux operating System, State History and at least 5 features of Linux.
- b) Explain ls command with at least 6 options.
- c) What are init run levels and rc scripts of Linux
- d) Explain cut commands with their options.
- e) Explain how to change file permissions in Linux with suitable example.
- f) Explain vi editor with its three modes.

**Que 5 Attempt any following ( Any Four) [20]**

- a) Explain Different Shell Environment variables.
- b) Explain different tasks of system administrator.
- c) Describe the functionality of Linux based iptables firewall.
- d) Explain startup and shutdown in Linux
- e) Write a shell script to accept Filename from user and delete that file if it exist else provide appropriate message to the user.
- f) Explain tar backup utilities in Linux

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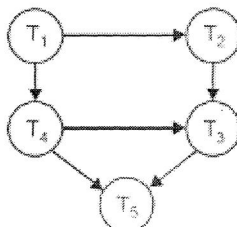
- Note:** (1) All questions are compulsory.  
(2) Figures to the right indicate full marks.  
(3) Illustrations, in-depth answers and diagrams will be appreciated.  
(4) Mixing of sub-questions is not allowed.

**Q1. Write short note on (any FOUR):** (20)

- (A) Lock Scheduler
- (B) Query Optimization
- (C) While loop
- (D) CASE
- (E) Functional Testing
- (F) Website Testing

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

- (A) Explain the concept of Write Ahead Log Protocol.
- (B) State the anomalies of concurrent transactions and explain any one of it.
- (C) In the following precedence graph, is the corresponding schedule conflict serializable? Explain your answer.



- (D) Compute the closure of the following set F of functional dependencies for relation schema  $R = \{A, B, C, D, E\}$ .

A  $\rightarrow$  BC  
CD  $\rightarrow$  E  
B  $\rightarrow$  D  
E  $\rightarrow$  A

List the candidate keys for R.

- (E) State the properties of Decomposition and explain any one of it.
- (F) State and explain the principles behind ARIES recovery algorithm.

**Turn Over**

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

- (A) Write a PL/SQL block to display the numbers from 1 to 10 using for loop.
- (B) Using explicit cursor, write a PL/SQL block to display the name of the employees.
- (C) Explain the concept of nested table.
- (D) Illustrate the concept of COMMIT and ROLLBACK with the help of an example.
- (E) Write a note on system catalog.
- (F) Explain EXIT and EXIT WHEN statement with example.

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

- (A) Explain the various knowledge area of project management.
- (B) Explain the components of function points used in estimation process.
- (C) What is risk? How it can be identified? Explain its classes.
- (D) Explain the different practices of Agile Development.
- (E) Define Extreme Programming and explain its core values.
- (F) A project has the following times schedule

Activity	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-9	8-10	9-10
Time in weeks	4	1	1	1	6	5	4	8	1	2	1	8	7

Construct network diagram and identify the critical path.

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

- (A) Explain the principles of software testing.
- (B) State the different levels of testing and explain unit testing.
- (C) Explain defect tracking and logging with its life cycle.
- (D) Differentiate between Black-box and White-box testing.
- (E) State the major objective of unit testing. List the inputs and output of it.
- (F) Draw the graph matrix and calculate the cyclomatic complexity of the given control flow graph

