

T.Y.B.SC. (IT) [SEM -VI]

Internet Technologies

(May-2017)

QP Code : 78228

(3 Hours)

[Total Marks: 100]

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
- I. Answer any two of the following: 10
a. Explain classless IPv4 addressing.
b. Write algorithm for input module in ARP process.
c. Explain Retransmission timer in TCP.
d. Write a note on HTTP protocol.
- II. Answer any three of the following: 15
a. Differentiate between IPv4 & IPv6 addressing.
b. Explain fragmentation offset in IPv4.
c. Explain fields in cache table in ARP process.
d. Write a note on mobile IP.
e. Write a note on ARP cases.
f. Explain process of ARP.
- III. Answer any three of the following: 15
a. Explain ICMP timestamp message type.
b. Explain different RIP drawbacks.
c. State & explain Dijkstra's algorithm.
d. Write a note on Link state routing protocol.
e. Write a note on BGP attributes.
f. Explain Distance Vector Routing protocol.
- IV. Answer any three of the following: 15
a. Write a short note on SCTP.
b. Explain Congestion control technique used by TCP.
c. List SCTP packets. Explain any two of them.
d. Write a note on three way handshake protocol used by TCP
e. Explain different connectionless services.
f. List different TCP options and explain any one.
- V. Answer any three of the following: 15
a. Write a note on different modes of TELNET operations.
b. Write a note on DHCP.
c. Explain DNS protocol.
d. Write a note on SSH components.
e. Write a note on FTP commands.
f. Explain TFTP protocol.
- VI. Answer any three of the following: 15
a. Explain CGI.
b. Write a note on Cookies in HTTP.
c. Explain different Mail transfer phases.
d. Write a note on MIME headers.
e. Write a short note on MIB.
f. Write a note on MPEG compression technique.

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VII. Answer *any three* of the following:

15

- a. Write a note on TCP socket programming
 - b. Write UDP socket program which reads a string from client and reverses it and sends it back to the client.
 - c. Write a TCP server socket which reads a number from client calculates its square and writes it back to the client.
 - d. Write a note on connectionless socket programming
 - e. Explain classes used for connection oriented socket programming.
 - f. Write a note on concurrent socket programming.
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LI-Con.1512-17.

T.Y.B.SC. (IT) [SEM -VI]

Digital Signals and System

(May-2017)

QP Code : 78224

3 Hours)

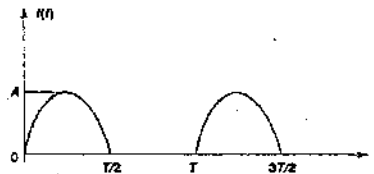
[Total Marks: 100

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

1. Attempt any two of the following:

10

- a. Obtain the trigonometric Fourier series for the half wave rectified sine wave shown below:



- b. Draw the pole-zero plot for $V(s) = \frac{(s+1)(s+3)}{(s+2)(s+4)}$. Evaluate $v(t)$ by using the pole-zero diagram. Confirm the result analytically.
c. For a low pass RC network, $R = 1 \text{ M}\Omega$ and $C = 1 \text{ }\mu\text{F}$. Determine the output response for n in the range $0 \leq n \leq 3$ when input has a step response of magnitude 2 V and the sampling frequency $f_s = 50 \text{ Hz}$
d. What are the advantages and disadvantages of digital signal processing over analog signal processing?

2. Attempt any three of the following:

- a. What is meant by quantisation and encoding? Explain.
b. Explain periodic and aperiodic signals with examples.
c. State and prove Parseval's theorem for Fourier transform.
d. What are energy and power signals? Determine if the following signals are energy signals or power signals or neither:
i. $x(t) = tu(t)$ ii. $x(n) = (-0.8)^n u(n)$
e. Determine the Fourier transform of Signum function and plot the amplitude and phase spectra.
f. State any ten properties of unit impulse function $\delta(t)$.

3. Attempt any three of the following:

15

- a. Define Laplace transform and inverse Laplace transform. What is region of convergence?
b. Find the Laplace transform of $\sin^3 3t$
c. Derive from the principals, the Laplace transform of a unit step function. Hence or otherwise determine the Laplace transform of a unit ramp function and a unit impulse function
d. If $L\{f_1(t)\} = F_1(s)$ and $L\{f_2(t)\} = F_2(s)$, show that $L\{f_1(t) \cdot f_2(t)\} = F_1(s) \cdot F_2(s)$
e. Find the Laplace transform of $\text{Cosat} \cdot \text{Cosbt}$
f. Obtain Laplace transform for step and Impulse Responses of a Series R-L Circuit.

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4. Attempt any three of the following: 15
- Determine the convolution of the two sequences $x(n) = \{2, 1, 1, 0, 5\}$ and $h(n) = \{2, 3, 2, 1\}$
 - State and explain any five properties of z-transform.
 - With reference to z-Transform, explain the initial and final value theorem.
 - State the Contour-Integration Residue method to calculate Inverse Z-Transformation.
Hence obtain Inverse Z-Transform of $X(z) = \frac{1}{(z-1)(z+3)}$.
 - Convolve the sequences $x(n)$ and $h(n)$ where

$$\begin{aligned} x(n) &= 0, n < 0 & h(n) &= 0, n < 0 \\ &= a^n, n \geq 0 & &= b^n, n \geq 0 \end{aligned}$$
 - Determine the inverse z-transform of

$$\hat{X}(z) = \frac{1}{(z+2)^2}; |z| < \frac{1}{2}$$

5. Attempt any three of the following: 15
- Compute the response of the system

$$y(n] = 0.7y(n - 1) - 0.12y(n - 2) + x(n - 1) + x(n - 2)$$
to the input $x(n) = nu(n)$
 - What is convolution in Linear Time Invariant System? What are the properties of convolution?
 - Check whether the following digital systems are BIBO stable
 - $y(n) = ax^2(n)$
 - $y(n) = ax(n) + b$
 - The output $y(n)$ for an Linear Time Invariant system to the input $x(n)$ is $y(n) = x(n) - 2x(n-1) + x(n-2)$. Compute the magnitude and phase of the frequency response of the system for $|\omega| \geq \pi$
 - Find the convolution of the two signals
 $x(n) = u(n)$ and $h(n) = a^n u(n)$, ROC: $|a| < 1; n \geq 0$
 - Consider a causal and stable LTI system whose input $x(n)$ and output $y(n)$ are related through the second order difference equation

$$y(n) - \frac{1}{12}y(n-1) - \frac{1}{12}y(n-2) = x(n)$$

Determine the step response for the system.

6. Attempt any three of the following: 15
- What are the methods used to perform Fast Convolution? Explain any one method giving all the steps involved to perform Fast Convolution.
 - Determine DFT of the sequence $x(n) = \begin{cases} \frac{1}{8} & 0 \leq n \leq 2 \\ 0 & \text{Otherwise} \end{cases}$
 - Compute 8-point DFT of the sequence $x(n) = \{1, 1, 1, 1, 1, 1, 1, 1\}$ by using DIF FFT algorithm.
 - Find the discrete time Fourier transform for the following finite duration sequence of length L. Also find the inverse DTFT to verify $x(n)$ for $L = 3$ and $A = 1V$:

$$\begin{aligned} x(n) &= A \text{ for } 0 \leq n \leq L - 1 \\ &= 0 \text{ otherwise.} \end{aligned}$$

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- e. Find the circular periodic convolution using DFT and IDFT of the two sequences:
 $x(n) = \{ 1, 1, 2, 2 \}$ and $h(n) = \{ 1, 2, 3, 4 \}$
- f. Compute the circular periodic convolution graphically of the two sequences:
 $x(n) = \delta(n) + \delta(n - 1) - \delta(n - 2) - \delta(n - 3)$ and
 $h(n) = \delta(n) - \delta(n - 2) + \delta(n - 4)$
7. **Attempt any three of the following:** 15
- a. Determine the unit sample response of the ideal low pass filter? Why is it not realizable?
- b. Design a Finite Impulse Response low pass filter with a cut-off frequency of 1kHz and sampling rate of 4kHz with eleven samples using Fourier series.
- c. Describe the Inverse Chebyshev filters.
- d. Explain the procedure for designing an FIR filter using Kaiser window.
- e. Design a digital Chebyshev filter to satisfy the constrains

$$0.707 \leq |H(e^{j\omega})| \leq 1, \quad 0 \leq \omega \leq 0.2\pi$$

$$|H(e^{j\omega})| \leq 0.1, \quad 0.5\pi \leq \omega \leq \pi$$
 Using bilinear transformation and assuming $T = 1s$.
- f. Design a bandpass filter to pass frequencies in the range 1-2 rad/sec using Hanning window $N = 5$.

T.Y.B.SC. (IT) [SEM -VI]

Data Warehousing

(May-2017)

QP Code : 78230

(3 Hours)

[Total Marks: 100]

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
- I. Answer any two of the following: 10
- Explain the terms source and target with an example.
 - What are the end user perspectives? Explain.
 - What is pilot data mart?
 - Explain analytical productivity and response time.
- II. Answer any three of the following: 15
- Explain life cycle of data in data warehouse.
 - Explain the ETL activities for unstructured text. Explain the type of data in the unstructured integrated environment.
 - Compare active data warehouse and federated data warehouse.
 - Write a short note on Helper Tables in DW.
 - How many to-many relationships can be implemented between fact and dimensional modelling?
 - Explain DW 2.0 and referential integrity.
- III. Answer any three of the following: 15
- What is total information quality management stream? Explain.
 - Explain Data marts and exploration facility in detail.
 - What is metadata? Explain the importance of metadata in data warehouse.
 - What is enterprise reference model? Explain in detail.
 - Explain in detail the components of infrastructure management system.
 - Write a short note on statistical analysis and heuristic analysis.
- IV. Answer any three of the following: 15
- Explain direct dump and sensing an attack.
 - Explain the role of data model in the integrated sector.
 - Explain the role of ETL data quality monitor.
 - What are the different levels of the data model?
 - What are the basic security measures? What are its drawbacks?
 - How is data model constructed for unstructured data?
- V. Answer any three of the following: 15
- Explain application data to corporate data in DW.
 - Write a short note on time collapsed data.
 - Explain the flow of data throughout the DW architecture.
 - What is nonoverlapping records and continuity of data? Explain.
 - "ETL in online mode and batch mode." Explain.
 - Explain the relationship of ETL with metadata

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- VI. Answer any three of the following: 15
- Explain ways to create granularity manager?
 - Write a short note on workload management and datamart.
 - Explain separation of transactions into classes.
 - Explain ETL as shock absorber in detail.
 - What is the use of parallelization for transaction processing?
 - How enterprise metadata can be created?
- VII. Answer any three of the following:unit6 15
- What are the different roles can be performed by company in training and user support.
 - Discuss B-tree and bitmapped indexing method in detail.
 - Write a short note on growth and maintenance.
 - Give reasons why the data warehouse must be backed up? How is this different from an OLTP system?
 - What are the steps used to load dimension table before fact table? Why?
 - Explain physical design process in detail.
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T.Y.B.SC. (IT) [SEM -VI]
Elective Project Management
(May-2017)

QP Code : 78377

(3 Hours)

[Total Marks: 100]

- N. B.: (1) Question **No. 1** is **compulsory**.
 (2) Attempt **any four** from **Question Nos. 2 to 7**.
 (3) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (4) Answers to the **same question** must be **written together**.
 (5) Numbers to the **right** indicate **marks**.
 (6) Draw **neat labeled diagrams** wherever **necessary**.
 (7) Use of **Non-programmable** calculators is **allowed**.

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| 1 | A | Define and explain the characteristic features of TQM in detail. | 5 |
| | B | Define and explain the characteristics of project. | 5 |
| | C | Explain the roles/responsibilities of a project manager | 5 |
| | D | Explain the project planning elements | 5 |
| 2 | A | What is Tendering? How to evaluate tenders? | 8 |
| | B | Explain the nature and characteristics of the organization. | 6 |
| | C | Enlist and explain the criteria for effective project control | 6 |
| 3 | A | What is Project Control? Explain the different types of control mechanism in detail. | 8 |
| | B | State the reasons for ineffective control of a project | 6 |
| | C | Distinguish between functional and project manager. | 6 |
| 4 | A | What are the advantages and disadvantages of project management | 8 |
| | B | Explain the procedures of "Decision Making". | 6 |
| | C | Define the following term: i) Optimistic Time ii) Pessimistic Time | 6 |
| 5 | A | What is audit? How it differs from review? List out and explain the phases in audit life cycle. | 8 |
| | B | Explain the different principles of organization. | 6 |
| | C | Distinguish between project audit and financial audit. | 6 |
| 6 | A | Describe the three constraints that affect any project | 8 |
| | B | Explain the kinds of Cybernetic Control Systems | 6 |
| | C | Define the term "Economic Analysis". | 6 |
| 7 | A | Describe bottom-up budgeting and its advantages | 8 |
| | B | Explain the different elements of a project plan. | 6 |
| | C | Explain the different levels of documentation? Describe the other documents also. | 6 |

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