B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Information Technology

IT 010 602—DIGITAL SIGNAL PROCESSING (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   **Maximum : 100 Marks**

Part A

Answer all questions.
Each question carries 3 marks.

1. What is meant by periodicity of a signal ?
2. How is convolution and Fourier transform of two signals are related ?
3. List the properties of z-transform.
4. How can the IIR systems be characterized ?
5. What is meant by twiddle factor ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. What is a stable system ?
7. What is meant by frequency and phase spectra of a signal ?
8. Explain the Sampling theorem.
9. Mention the advantages of FIR filters over IIR filters.
10. List some issues connected with finite word length effects in implementing digital filters.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each question carries 12 marks.

11. Check the properties of digital systems BIBO stability, linearity and causality

    (a) $y(n) = a\, x^2(n)$.

    (b) $y(n) = a\, x(n+1) + bx(n-1)$.   (12 marks)

Or

Turn over

12. (a) Check the linearity and time invariance property of system defined by the equation $y(n) = x(-n)$.

    (4 marks)

    (b) Determine whether the system defined by difference equation

    $y(n) = avg\left[x(n+1), x(n), x(n-1)\right]$ is stable or not.

    (8 marks)

13. Determine impulse response $G(n)$ for the causal system $y(n) - y(n-1) = x(n) + x(n-1)$. Test its stability.

    (12 marks)

Or

14. Determine frequency response and magnitude response of the system given by

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

    (12 marks)

15. Check the stability condition for the DSP system described by the equation :

    (a) $y(n) = a^n u(n)$.

    (b) $y(n) = x(n) + e^a y(n-1)$.

    (12 marks)

Or

16. Explain the properties of a DSP system :

    (a) Linearity.   (b) Time-invariance.

    (c) Causality.   (d) Stability.

    (12 marks)

17. Obtain cascade and parallel realisation structures

    $H(z) = \dfrac{z/6 + 5/24 + 5/24\, z^{-1} + 1/24\, z^{-2}}{1 - z^{-1}/2 + z^{-2}/4}$.

    (12 marks)

Or

18. Determine direct form I and II realisation for :

    $H(z) = \dfrac{0.28\, z^2 + 0.319\, z + 0.04}{0.5\, z^3 + 0.3\, z^2 + 0.17\, z - 0.2}$.

    (12 marks)

19. Determine the 16-point DFT of the sequence :

    $x(n) = \{0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1\}$ using DIT FFT algorithm.

    (12 marks)

Or

20. Given $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ find $X(k)$ using DIF FFT algorithm.

    (12 marks)

    [5 × 12 = 60 marks]

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Information Technology

IT 010 604—SOFTWARE ENGINEERING

(Regular/Improvement/Supplementary)

[New scheme—2010 admission onwards]

Time : Three Hours   Maximum : 100 Marks

Part A

*Answer **all** questions.*
Each question carries 3 marks.

1. What is meant by specialized process Model ?
2. Specify the advantage of developing Use cases.
3. Discuss the objectives of software Design.
4. Differentiate between Alpha Testing and Beta Testing.
5. What is meant by Process Metrics ? Explain.

(5 × 3 = 15 marks)

Part B

*Answer **all** questions.*
Each question carries 5 marks.

6. Discuss extreme Programming.
7. Briefly discuss the importance of class-Based Modelling.
8. What is meant by software Architecture ?
9. Define software Reliability.
10. What are risk management activities ? Explain.

(5 × 5 = 25 marks)

Part C

*Answer **all** questions.*
Each question carries 12 marks.

11. Discuss any *one* Agile Process Model.   (12 marks)

Or

12. Discuss in detail, the phases of the unified process.   (12 marks)

Turn over

13. Write notes on Requirements modelling for web application. (12 marks)

Or

14. Discuss FAST and compare this with Brain Storming Sessions. (12 marks)

15. Discuss various Architectural styles. (12 marks)

Or

16. Discuss different strategies of design. (12 marks)

17. Explain the importance of path testing during structural testing. (12 marks)

Or

18. What is the purpose of Integration Testing ? How is it done ? (12 marks)

19. Discuss typical software risks. How staff turnover problem affects software projects ? (12 marks)

Or

20. Discuss any one empirical estimation model. (12 marks)

[5 × 12 = 60 marks]

G 1237   (Pages : 2)   Reg. No............................

Name...............................

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Information Technology

IT 010 601—Computer Networks (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. What are Gateways ?

2. What is ATM ?

3. Explain Pure ALOHA.

4. What are Datagrams ?

5. What is a Piconet ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain Geostationary satellites.

7. Explain MIME.

8. Discuss the design issues involved in Data Link Layer.

9. Explain Optimality Principle.

10. Compare UDP and TCP.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each full question carries 12 marks.

11. Explain TCP/IP reference model. State the functions of each layer.

Or

Turn over

12. Explain Network Hardware in detail.

13. (a) Explain carrier sense Multiple Access protocol.

    (b) State the differences between Persistent and Non-persistent CSMA.

                                   Or

14. Explain Error detection and Error correction involved in Data Link Layer.

15. (a) Explain the concept of Multicasting.

    (b) Explain Link state Multicasting and Distance vector multicasting.

                                   Or

16. (a) Explain the concept of Flooding.

    (b) Explain Leaky Bucket Algorithm.

17. Discuss the elements of Transport protocols.

                                   Or

18. Explain an ATM Network in detail.

19. (a) Discuss the operation of DNS.

    (b) Explain the concept of Electronic Mail System.

                                   Or

20. Explain briefly on :

    (a) L2CAP Layers.

    (b) Communication in Bluetooth networks.

                                                 (5 × 12 = 60 marks)

G 1268

(Pages : 2)

Reg. No.................................

Name.................................

B.TECH DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Information Technology

IT 010 606 L04—(Elective I) ADVANCED DATABASE SYSTEMS (IT)

(New Scheme—2010 Admission onwards)

[Regular / Improvement / Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. What is meant by multi database system ?

2. Define object identity.

3. Define support and confidence.

4. What is meant by functional dependency ?

5. Write a note on interquery parallelism.

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain the use of semi-join operator in distributed query processing.

7. What is the difference between persistent and transient objects ? How is persistence handled in typical OODBMS ?

8. Explain roll-up and drill-down operations.

9. Write a note on spatial databases.

10. Write a note on text databases.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each full question carries 12 marks.

11. Explain the transparencies in distributed DBMS.   (12 marks)

Or

12. (a) Explain concurrency control in distributed databases.   (6 marks)

    (b) Explain horizontal fragmentation, with examples.   (6 marks)

Turn over

13. Explain the advantages and disadvantages of using object oriented DBMS.   (12 marks)

Or

14. (a) Explain pointer swizzling techniques.   (6 marks)

    (b) Explain how type constructors are used to create complex object structures.   (6 marks)

15. (a) Explain the need of transaction servers in client-server systems.   (6 marks)

    (b) Explain the steps in building a data warehouse.   (6 marks)

Or

16. Explain various data mining techniques.   (12 marks)

17. (a) Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.

                                                                                      (6 marks)

    (b) Write a note on database tuning.   (6 marks)

Or

18. (a) Explain query optimization techniques.   (6 marks)

    (b) Explain 3NF, with example.   (6 marks)

19. (a) Explain parallel join techniques.   (6 marks)

    (b) Write a note on knowledge discovery in databases.   (6 marks)

Or

20. (a) Briefly explain deductive databases.   (6 marks)

    (b) Explain the issues to be addressed while designing multimedia database.   (6 marks)

                                                                          [5 × 12 = 60 marks]

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Information Technology

IT 010 603—INFORMATION THEORY AND CODING (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 3 marks.

1. Define mutual information and channel capacity. Relate it.

2. State and explain Shannon's source coding theorem.

3. What are instantaneous codes ? Why are they called so ?

4. Define hamming weight and hamming distance. How many errors that can be detected and corrected for a (7, 4) hamming code.

5. What is interleaving ? Explain its need.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 marks.

6. A discrete memoryless source emits an independent sequence of symbols from an alphabet consisting of five symbols ones in every two milliseconds. The symbols are A, B, C, D and E with respective symbol probabilities $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{8}$, $\frac{3}{16}$ and $\frac{5}{16}$. Find entropy of the source and information rate.

7. Sketch the transition diagram of a binary erasure channel and write its state transition matrix. If 'p' is the probability of correct reception, show that capacity of this channel is p bits/symbol.

8. Explain the principle of ZIP coding.

9. Describe the steps involved in the algorithm to generate an (n, k) cyclic code.

10. Explain the process of interpolation and muting.

(5 × 5 = 25 marks)

Turn over