G 5387 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

Sixth Semester

Branch : Information Technology

IT010 604 : SOFTWARE ENGINEERING—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 Outline the advantages of extreme programming.

2 What do use case "exceptions" represent ?

3 Define modularity. Give example.

4 Outline the primary purpose of system testing.

5 Define project metries. Give example.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 marks.

6 Present an overview of component-based development model.

7 Outline the problems that occur when requirements must be elicited from three or four different customers.

8 What is cohesion ? Explain functional cohesion with an example.

9 Define stress testing. How stress tests are designed ? Give example.

10 How is a project schedule created ?

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*

Each question carries 12 marks.

11 Compare the waterfall life cycle model and spiral life cycle model.

Or

12 Discuss the Agile process. What are the Agile process strengths ? What are the Agile process deficiencies ? When to use the Agile process ?

Turn over

13 What is a requirements model ? Outline the elements of the requirements model.

Or

14 What is class-based modeling ? Discuss with an example.

15 What is an architectural style ? Explain with diagrammatic illustration data-centered architecture and data-flow architecture.

Or

16 What is user interface design ? Explain with diagrammatic illustration the user interface design process.

17 Explain with an example unit testing and integration testing in the object oriented context.

Or

18 Explain with an exaple condition testing, data flow testing and loop testing.

19 (a) Describe the difference between process metrics and project metries.

(b) Outline the need for integrating metries within the software process.

Or

20 What is project planning ? Outline the task set for project planning.

(5 × 12 = 60 marks)

G 5401 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

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. Outline the functions performed by a gateway.
2. How slotted ALOHA protocol works ?
3. Define multicasting. Give example.
4. What are switched virtual circuits in ATM networks ?
5. Outline the features of MIME.

(5 × 3 =15 marks)

Part B

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

6. Compare low earth orbit satellites and medium earth orbit satellites.
7. Explain with an example sliding window protocol using select repeat.
8. Compare virtual circuits and datagrams.
9. Outline the elements of transport protocols.
10. Explain piconet and scatternet with an example and diagrammatic illustration.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. Explain with diagrammatic illustration the functions performed by each layer of the TCP / IP reference model.

Or

12. Explain with diagrammatic illustration architecture of integrated services digital network.

13. We want to transmit the message M = 1 0 1 1 0 0 1 0 1 0 (10 bits) ; the pattern P = 1 1 1 0 1 1 (6 bits). Use cyclic redundancy check algorithm to perform the following :

    (a) Calculate frame check sequence. (5 marks)

    (b) What is the transmitted frame ? (3 marks)

    (c) Illustrate how the receiver will detect error, if the second bit and the fourth bit of the transmitted frame are toggled. (4 marks)

Or

14. How CSMA protocol works ? Explain 1- persistent, *p*-persistent and non-persistent CSMA with an example.

15. What is routing ? Explain link state routing algorithm with an example.

Or

16. Explain any *two* congestion prevention policies with an example.

17. Explain with an example and diagrammatic illustrations connection establishment and connection release in transmission control protocol.

Or

18. How user datagram protocol works ? How user datagram protocol differs from transmission control protocol ? Explain with an example.

19. (a) What is a domain name system ? Tabulate the top-level internet domains and their meaning. (6 marks)

    (b) Given a hierarchy of name servers, how a client engages these servers to resolve a domain name ? Explain with an example. (6 marks)

Or

21. Explain with diagrammatic illustration the Bluetooth protocol stack.

(5 × 12 = 60 marks)

G 5442 (Pages : 2) Reg. No.....

Name.....

B.TECH DEGREE EXAMINATION, APRIL/MAY 2017

Sixth Semester

Branch : Information Technology

IT 010 606 L04 : ADVANCED DATABASE SYSTEMS (Elective I) (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 How is horizontal partitioning of a relation specified ? How can a relation be put back together from a complete horizontal partitioning ?

2 What is an object ? Give example.

3 Define data mining.

4 What is a temporal database ?

5 Define a knowledge base.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 marks.

6 What is a distributed transaction ? Explain with an example.

7 Explain persistence and inheritance with an example.

8 Why data preprocessing is an important issue for both data warehousing and data mining ? Discuss.

9 Outline the issues related to database security.

10 What is I/O parallelism ? Explain with an example interquery parallelism.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*

Each question carries 12 marks.

11 What is a distributed database management system ? Explain distributed query processing with an example.

Or

Turn over

12 (a) Outline the properties that must be satisfied by a transaction.

(4 marks)

(b) Explain log based recovery with an example.

(8 marks)

13 Discuss transaction management and concurrency control in object oreiented database with an example.

Or

14 Design an object oriented database for a "Banking System". State the functional requirements you are considering.

15 Explain with diagrammatic illustration the steps in the knowledge discovery process.

Or

16 Outline the features of the following databases :

(a) Mobile Databases. (6 marks)

(b) Web Databases. (6 marks)

17 Model an entity relationship diagram for a "Library Management System". State the functional requirements you are considering.

Or

18 What are the levels at which a database system can be tuned to improve performance ? Discuss any two levels with example.

19 (a) Explain with an example how a deductive database system can make deductions based on rules and facts stored in the database.

(6 marks)

(b) Outline the differences between row-level and ststement-level active rules with an example.

(6 marks)

Or

20 Outline the features of the following databases :

(a) Image Databases. (6 marks)

(b) Text Databases. (6 marks)

[5 × 12 = 60 marks]

G 5372

(Pages : 3)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

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. What is entropy ? State its properties.
2. State and explain Shannon's source coding theorem.
3. Define mutual information and channel capacity and relate them.
4. What is interleaving ? Explain its significance.
5. What is Huffman coding ? Explain with example.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 *marks.*

6. Explain the trade-off between bandwidth and signal to noise ratio.
7. Explain the process of interpolation and muting.
8. Explain Viterbi algorithm in brief.
9. State and prove Kraft's Inequality.
10. Explain the principle of arithmetic coding.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*

Each full question carries 12 *marks.*

11. (a) State and prove Shannon Harley theorem. (6 marks)

(b) Define code efficiency and redundancy in detail. (6 marks)

Or

12. A source emits one of four symbols S_0, S_1, S_2 and S_3 with probabilities $\frac{1}{3}, \frac{1}{6}, \frac{1}{4}$ and $\frac{1}{4}$ respectively. The successive symbols emitted by the source are statistically independent. Calculate the entropy of the source, code efficiency and redundancy.

13. (a) State and prove properties of entropy. (6 marks)

(b) Prove I (X ; Y) = H (X) – H (X/Y). (6 marks)

Or

14. State and prove Shannon-Hartley theorem for the channel capacity of a band limited AWGN channel.

(12 marks)

15. An information source produces sequences of independent symbols having following probabilities :

A	B	C	D	E	F	G
$\frac{1}{3}$	$\frac{1}{27}$	$\frac{1}{3}$	$\frac{1}{9}$	$\frac{1}{27}$	$\frac{1}{3}$	$\frac{1}{27}$

(i) Give the Huffmann coding algorithm. (4 marks)

(ii) Using the above algorithm, encode the given source. (4 marks)

(iii) Find efficiency and redundancy of the code. (4 marks)

Or

16. Explain channel coding theorem. What is its application to Binary Symmetric Channels ?

(12 marks)

17. The generator polynomial of a (15, 11) Hamming code is defined by : $g(x) = 1 + x + x^4$ Develop the encoder and syndrome calculator for this code, using a systematic form of the code.

Or

18. (a) Design a syndrome calculator for a (7, 4) cyclic Hamming code generated by the polynomial $g(x) = x^3 + x + 1$. Calculate the syndrome for r = 1 0 0 1 10 1.

(6 marks)

(b) Explain in detail :

(i) BCH codes.

(ii) RS codes.

(6 marks)

19. Explain ML decoding of convolutional codes.

Or

20. Describe in detail :

(i) Stack algorithm.

(ii) ARQ strategies.

[5 × 12 = 60 marks]

G 5359 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2017

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. Outline the various elements of a Digital Signal Processing System.
2. State and prove Parseval's theorem.
3. Discuss the ROCs of finite duration discrete time signals.
4. Discuss the factors that influence the choice of realization of an IIR system.
5. Compare and contrast UR and FIR.

(5 × 3 = 15 marks)

Part B

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

6. Check if the following signals are periodic or aperiodic :

   (a) $\cos(8\pi n/31)$. (b) $\cos(\sqrt{2}\,\pi n)$.

   (2½ + 2½ = 5 marks)

7. Discuss the properties of convolution.
8. Discuss the analysis of LTIS based z-transform.
9. Obtain the transposed form of the system described by :

   $$y(n) = y(n-1) - \frac{1}{2}y(n-2) + x(n) + \frac{7}{4}x(n-1) - \frac{1}{2}x(n-2).$$

10. Compare the computational complexity of direct computation of DFT and FFT algorithm for computation of DFT.

[5 × 5 = 25 marks]

Turn over

Part C

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

11. Check the following discrete time systems for stability, causality, time invariance and linearity :

(a) $x(n)\cos w_0 n = y(n)$. (b) $y(n) = Ax(n) + B$.

(6 + 6 = 12 marks)

Or

12. Consider $x(n) = \{1, \underset{\uparrow}{1}, 1, 1, 1/2, 1/2\}$. Sketch and label each of the following signals :

(a) $x(n-2)$. (b) $x(4-n)$.

(c) $x(n^2)$. (d) $x(n)\,u(2-n)$.

(e) $x(n)\delta(n-3)$. (f) Even part of $x(n)$.

(2 + 2 + 2 + 2 + 2 = 10 marks)

13. Determine the response of the system described by $h(n) = [u(n+2) - u(n-3)] \cdot (3 - |n|)$ to the input signal $x(n) = u(n+1) - u(n-4) - \delta(n-5)$.

Or

14. Determine and sketch the magnitude response and phase response of :

$$y(n) = \frac{1}{3}[x(n) + x(n-1) + x(n-2)] .$$

15. Obtain the z-transform of $x(n) = a^n n^2 u(n)$ by applying the properties.

Or

16. Obtain the discrete time signal represented by the z-transform :

$$X(z) = \frac{1}{(1 - 1.5z^{-1} + 0.5z^{-2})} ; \text{ROC} : 0.5 < |z| < 1.$$

17. Realize the following transfer function using direct form II and parallel structure :

$$H(z) = \frac{(8z^3 - 4z^2 + 11z - 2)}{(0.5 - z + z^2)(-0.25 + z)} .$$

Or

18. Write notes on finite word-length effects.

19. Determine the 8-point DFT of the following sequence using DIT-FFT algorithm :

$x(n) = \{1, -1, -1, -1, 1, 1, 1, -1\}$.

Or

20. The desired response of a LPF is :

$$H_d(w) = \begin{cases} e^{-j3w}, & -3\pi/4 \le w \le 3\pi/4 \\ 0, & 3\pi/4 \le |w| \le \pi. \end{cases}$$

Determine H (w) for M = 7 using Hamming window.

(5 × 12 = 60 marks)