(i) Printed Pages : 2

(ii) Questions : 9

Bachelor of Computer Applications 5th Semester

(1129)

COMPUTER NETWORKS

Paper—BCA–16–501

Time Allowed : Three Hours]   [Maximum Marks : 65

Note :— Attempt **one** question each from Sections A, B, C and D. Section E is compulsory.

SECTION—A

1. (a) Explain the features of LAN, MAN and WAN.   7

   (b) Draw and describe various layers of TCP/IP model. How is it different from OSI reference model ?   6

2. (a) What is the meaning of unguided transmission media and its benefits over guided media ? Explain the working of microwave transmission.   7

   (b) What is multiplexing in computer networks ? Explain and differentiate between FDM and WDM in brief.   6

SECTION—B

3. (a) What are the design issues of Data Link Layer ?   7

   (b) What is an error in Computer Networks ? Explain CRC technique with the help of suitable example.   6

4. (a) What are the various assumptions of static channel allocation ? 4

   (b) What are the Sliding Windows Protocols ? Explain Go-Back-N and Selective-Repeat Sliding Windows Protocols along with their advantages and disadvantages. 9

SECTION—C

5. (a) What are the various design issues of Network Layer ? 9

   (b) What do you understand by Subnetting ? 4

6. (a) What is congestion ? What are the factors that lead to congestion in a network ? Explain the principles of congestion control. 6

   (b) Explain broadcast and multicast routing. 7

SECTION—D

7. (a) Explain DNS and DNS servers. 6

   (b) Explain terms HTTP and Network Security. 7

8. (a) Write short notes on the following terms :

   (i) World Wide Web

   (ii) File Transfer Protocol. 3×2=6

   (b) Explain the architecture and services of an E-mail System. 7

SECTION—E

9. Attempt **all** questions :

   (a) Define modulation. 2

   (b) What is IEEE 802.3 ? 2

   (c) What is an IP address ? 2

   (d) What are the light emitting sources used in Fiber Optics ? 2

   (e) What are the limitations of SMTP ? 2

   (f) What are the advantages of flooding ? 3

(i) Printed Pages: 3

(ii) Questions : 9

Roll No. ....

Sub. Code : $\boxed{0}\boxed{9}\boxed{4}\boxed{8}$

Exam. Code : $\boxed{0}\boxed{0}\boxed{3}\boxed{1}$

Bachelor of Computer Applications 5th Semester
(1129)
DISCRETE MATHEMATICAL STRUCTURE
Paper : BCA-16-502

Time Allowed : Three Hours]   [Maximum Marks : 65

Note :— Attempt **FIVE** questions in all, including Q. **9** in Unit-V which is compulsory and taking **ONE** each from Unit-I to Unit-IV.

UNIT—I

1. (a) Find f o g, g o f, f o f and g o g compositions for the following functions :

$$f(x) = x^2 + 2, \quad g(x) = 1 - \frac{1}{1-x}, x \neq 1.$$

   (b) Draw the graph of the function $y = [x] - 2$, where $[x]$ is the greatest integer $< = x$.   7,6

2. (a) Prove that $f : R \to R$ defined by $f(x) = x^2 + 3$ is neither one-one nor onto function.

   (b) Let A = {1, 2, 3}, B = {4, 5} and C = {1, 4} be three sets. Find A × B, B × A, A × (B ∪ C) and (A ∩ C) × B.   7,6
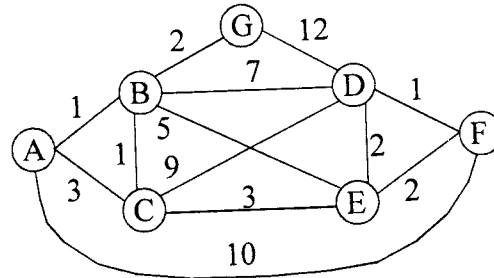
UNIT—II

3. (a) A sequence is defined by the recurrence relation $t_{n+1} = a\, t_n + b$ with $t_1 = 4$, $t_2 = 3.2$ and $t_3 = 2.04$. Find the values of a and b.

   (b) Find the sequence (t_n) satisfying the recurrence relation $t_n = 2t_{n-1} + t_{n-2} - 2t_{n-3}$, $n >= 3$, and the initial conditions $t_0 = 1$, $t_1 = 2$ and $t_2 = 0$.   7,6

4. (a) A sequence is defined by the recurrence relation $t_{n+1} = 0.6\, t_n + 4$ with $t_0 = 7$.

   Calculate the value of t_3 and the smallest value of n for which $t_n > 9.7$.

   (b) Determine the generating function of the sequence :

   $0, 1, 2^2, 3^2, \ldots\ldots, n^2, \ldots\ldots\ldots$ 7,6

UNIT—III

5. (a) For each of the following, either give an example, or prove there are none :

   (i) A simple graph with 6 vertices, whose degrees are 2, 2, 2, 3, 4, 4.

   (ii) A simple graph with 8 vertices, whose degrees are 0, 1, 2, 3, 4, 5, 6, 7.

   (iii) A simple graph with degrees 1, 2, 2, 3.

   (b) State Euler's formula for connected planar graphs. If a connected planar graph had 6 vertices and 9 edges then how many faces would it have ?   7,6

6. Calculate the single-source shortest paths from A to every other vertex in the following undirected, weighted graph :

13

UNIT—IV

7. What is a finite state machine ? Why is it required ? What are the elements of FSM ? Design an NFA which does not accept set of all strings with two consecutive zeros. 13

8. What is an algorithm ? What are its features ? How do you determine the time as well as space complexity of an algorithm ? Explain with examples. 13

UNIT—V
(Compulsory Question)

9. (a) Given that A = {2, 4} and B = {x : x is a solution of $x^2 + 6x + 8 = 0$}. Are A and B disjoint sets ?

   (b) Write the power set of the set A = {y : y $\in$ N and $1 \le y \le 3$}.

   (c) A Moore state machine usually has power states than the equivalent Mealy machine. (True/False)

   (d) Define Travelling Salesman Problem.

   (e) Define Recursive algorithm.

   (f) What is regular expression in Automata theory ?

3,5×2=13

(ii) Questions   : 9   **Sub. Code :** ☐0☐9☐4☐9☐

Exam. Code : ☐0☐0☐3☐1☐

Bachelor of Computer Applications 5ᵗʰ Semester

(1129)

JAVA PROGRAMMING

Paper—BCA—16–503

Time Allowed : Three Hours]   **[Maximum Marks : 65**

Note :— Attempt any **one** question each from Units I—IV. Unit V is compulsory.

UNIT—I

1. (a) Write any four characteristics of Java Programming language.   4

   (b) What is the use of constructors ? Explain the concept of constructors in Java with a program.   9

2. (a) What is method overloading ? Write a program in Java to illustrate the concept of method overloading.   9

   (b) Explain the concept of dynamic method dispatch.   4

UNIT—II

3. (a) Write a program in Java to illustrate the implementation of multiple inheritances through interfaces.   9

    (b) Explain any two functions of String class.   4

4. (a) What are packages ? How do you create and use them in Java ?   9

    (b) How one dimensional and two dimensional arrays are declared in Java ?   4

UNIT—III

5. (a) What type of errors would you get at run time ? How Exceptions can be handled in Java ? Explain with suitable examples.   9

    (b) How and when do you create a thread using Runnable interface ?   4

6. What are the different types of Applets ? With the help of diagram discuss the different stages in the lifecycle of an applet.

  13

UNIT—IV

7. What is GUI ? How can you add text box used for accepting passwords ? What is the difference between checkbox and radio button ? Explain with Java program.   13

8. What is the purpose of JDBC driver ? Write the steps to insert, update and delete record in database using JDBC.   13

UNIT—V

9. (a) What is access protection in packages ?   2

   (b) What is the importance of paint ( ) method in Applet ?   2

   (c) Why can't we use a keyword name as variable name ?   2

   (d) What is the difference between finally and final ?   2

   (e) What are the applications of OOP technology ?   2

   (f) In what ways does a Switch statement differ from if statement ?   3

(i)   Printed Pages : 2   Roll No. ....

(ii)   Questions   : 9   Sub. Code : ⎣0⎦⎣9⎦⎣5⎦⎣0⎦

                                 Exam. Code : ⎣0⎦⎣0⎦⎣3⎦⎣1⎦

Bachelor of Computer Applications 5ᵗʰ Semester
(1129)
WEB APPLICATION DEVELOPMENT USING PHP
Paper—BCA-16-504

Time Allowed : Three Hours]   [Maximum Marks : 65

Note :— Attempt **five** questions in all, by choosing any **one** question
each from Units I–IV. Unit V is compulsory.

UNIT—I

1. (a) State the differences between static website and dynamic
        website development.   6

   (b) Discuss the various looping statements used in PHP with
        suitable example.   7

2. (a) How do you print the values of variables in PHP ?   4

   (b) Discuss the if else statement and the conditional operators
        with suitable example.   4

   (c) Write a note on the file inclusion statements in PHP.   5

UNIT—II

3. How do you define a function in PHP ? What is difference between
   formal and actual arguments ? What happens when there is argument
   mismatch during function call ? Create a PHP program which finds
   the factorial of number recursively using functions.   13

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4. (a) Write a PHP program to find the number of characters in the string. 6

   (b) Discuss the functions for Inspecting arrays. 7

UNIT—III

5. (a) Discuss the two methods used in HTTP to handle form data. 5

   (b) Write a PHP code to connect to database. 5

   (c) Write a note on super global arrays. 3

6. How do you create a query in PHP ? How do you fetch the dataset ? Discuss the four fetching functions in detail. 13

UNIT—IV

7. What are cookies ? Why are they used ? How do you create, read and delete a cookie ? 13

8. (a) Discuss the PHP file permissions. 6

   (b) How is file opened and closed in PHP ? Discuss the various file opening modes. 7

UNIT—V

(Compulsory)

9. (a) How do you configure PHP environment ? 2

   (b) How do you include PHP section in HTML page ? 2

   (c) What are the various ways to represent multi line and single line comments in PHP ? 2

   (d) What is static variable ? 2

   (e) How PHP supports editing of data with HTML form ? 2

   (f) How do you increase the session expire time ? 2

   (g) Name any two directory functions. 1