

2012

Bachelor of Computer Application  
Fifth Semester  
BCA-16-501: Computer Networks

Time allowed: 3 Hours

Max. Marks: 65

**NOTE:** Attempt five questions in all, including Question No. 9 (Section-E) which is compulsory and selecting one question each from Section A-D.

x-x-x

**Section A**

1. a) What are peer-to-peer networks and broadcast networks? Write the differences between these networks. (4)
- b) Explain the functions of different layers of OSI Reference model. (9)
2. a) What is the meaning of unguided transmission media? Explain Radio wave and Microwave transmissions. (7)
- b) What is ISDN? Explain different ISDN services. (6)

**Section B**

3. a) What is the importance of framing in Data Link Layer? Explain various techniques of framing. (7)
- b) How CRC code is used in error detection? Illustrate your answer with a relevant example. (6)
4. a) What are Data Link protocols for noisy channels? (4)
- b) What are the Sliding Windows protocols? Explain stop & wait ARQ and Go-Back-N ARQ along with their advantages and disadvantages. (9)

**Section C**

5. a) Explain the role of these components in a computer network- Hub, Bridge, Repeater, Modem and Switch (5)
- b) Explain shortest Path and Flooding methods of routing? (8)
6. a) What is congestion? What are the factors that lead to congestion in a network? Explain Leaky Bucket algorithm. (7)
- b) What is IP? Explain the different IP addressed Classes. (6)

**Section D**

7. a) What is the importance of network security in today's communications networks? How organizations can protect data during online communication? (6)
- b) Explain World Wide Web. (7)

P.T.O.

(2)

8. Write short notes on the following terms

(5,4,4)

- i) POP3      ii) SMTP      iii) MIME

### Section E

9. Attempt all questions

- a. Write benefits of computer networks during a Pandemic? (2)
- b. What is Half Duplex transmission? Give two examples. (2)
- c. What is Multi - mode fiber optics? (2)
- d. What is Token Bus? (2)
- e. What is used as light detectors in Fiber Optics? (1)
- f. What are the drawbacks of light wave transmission? (2)
- g. What is Remote Login? (2)

X-X-X

Total No. of Sheets used.....  
 No. of Questions set 9

SHEETS NO. 1  
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Panjab University, Chandigarh

Examination: BCA (5<sup>th</sup> Semester)  
 Course Name: Discrete Mathematical Structure  
 Time Allowed: 3 Hours

January 2022  
 Course Code: BCA-16-502  
 Maximum Marks: 65

Note: Attempt FIVE questions an all, including Q-9 in section-E, which is compulsory and taking ONE Question each from Sections A-D. Each Question carries 18 marks.

SECTION-A

- 1) a) Let  $R = \{(3, 1), (1, 3), (3, 3)\}$  be a relation defined on the set  $A = \{1, 2, 3\}$ . Then R is symmetric, transitive but not reflexive.  
 b) Show that the function  $f: \mathbb{R} \rightarrow \mathbb{R}$  defined by  $f(x) = \cos(x), \forall x \in \mathbb{R}$ , is neither one-one nor onto. (7, 6)

- 2) a) Let  $A \times B = \{(1, 1), (2, 2), (3, 1), (3, 2), (1, 2), (1, 4), (2, 1), (2, 4), (3, 4)\}$ . Find the power set of B,  $P(B)$ .  
 b) Find  $g \circ f$  and  $g \circ g$  for the functions f and g as defined below:

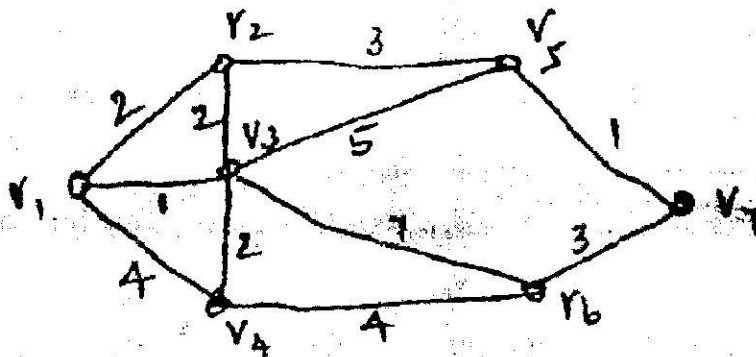
$f, g: \mathbb{R} \rightarrow \mathbb{R}$  defined, respectively, by  $f(x) = x^2 + 3x + 1, g(x) = 2x - 3, \forall x \in \mathbb{R}$ . (7, 6)

SECTION-B

- 3) Solve the following recurrence relation :  
 $S(n) - 4S(n-1) - 11S(n-2) + 30S(n-3) = 0$  with  $S(0) = 0, S(1) = -35$  and  $S(2) = -85$ . (13)  
 4) Solve the following recurrence relation by using the method of generating functions:  
 $h_n = h_{n-1} + h_{n-2} (n \geq 2); h_0 = 1, h_1 = 3$ . (13)

SECTION-C

- 5) a) If a graph has exactly two vertices of odd degree, prove that there must be a path joining these two vertices.  
 b) Prove that in a graph G, the number of vertices of odd degree is even. (7, 6)  
 6) a) Explain the travelling-salesman problem and its solution.  
 b) What is the shortest path between  $v_1$  and  $v_7$  in the following weighted graph?



(6, 7)

SECTION-D

- 7) What is a state in a finite state machine (FSM)? Consider the set of strings over  $\{0, 1, 2\}$  such that the sum of the digits is a multiple of 3. Draw a deterministic finite-state machine that accepts this language. Use as few states as possible. (13)  
 8) Define computer algorithm and its features. Explain  $O, \Theta$  and  $\Omega$  notations used in analyzing algorithms with diagrams. (13)

SECTION-E (Compulsory Question)

- 9) a) What are the applications of Venn diagrams?  
 b) How many edges are there in a graph with 10 vertices each of degree 5?  
 c) What do you mean by recursive algorithm?  
 d) Explain what is meant by 'complexity of problems' in relation to computer science.  
 e) Define Degree of a Graph.  
 f) Draw the graph of the function  $f(x) = |x| + 5$  for  $x \in [-5, 5]$ . (5x2,3=13)

2012

Bachelor of Computer Application

Fifth Semester

BCA-16-503: Java Programming

Time allowed: 3 Hours

Max. Marks: 65

**NOTE:** Attempt five questions in all, including Question No. 9 (Unit-V) which is compulsory and selecting one question each from Unit- I-IV

x-x-x

**Unit-I**

1. a) Write notes on following:
  - (i) Byte Code (ii) Java Virtual Machine (iii) Java Development Kit (6)
- b) Explain the concept of Constructors in Java with suitable examples. (7)
2. a) What is method overriding? Write a program in java to illustrate the concept of method overriding. (9)
- b) Explain the concept of dynamic method dispatch. (4)

**Unit-II**

3. a) How to implement interfaces in Java? Explain with suitable example. (9)
- b) What is the difference between String and String Buffer class? (4)
4. a) What are packages? What are their types? How do you use them in Java program? (9)
- b) Write short notes on two-dimensional Arrays. (4)

**Unit-III**

5. What are the various ways to create a Thread in Java? Also explain the Java thread model. (13)
6. Write a Java applet to draw various shapes like rectangles, ellipse, arcs and polygons? Compare and contrast applets and application programs. (13)

**Unit-IV**

7. What is AWT in Java? Explain any five AWT controls with the help of Java program. (13)
8. What is the use of JDBC? Write the steps to select and update record in database using JDBC. (13)

**Unit-V**

9. a) What are Layout managers in Java? (2)
- b) What are the various applications of Java? (2)
- c) What is the functionality of static class? (2)
- d) What is abstract class? (2)
- e) What is the importance of init() method in Applet? (2)
- f) What is synchronizations in multithreading? (3)

x-x-x

2012  
Bachelor of Computer Application  
Fifth Semester  
BCA-16-504: Web Application Development Using PHP

Time allowed: 3 Hours

Max. Marks: 65

**NOTE:** Attempt five questions in all, including Question No. IX (Section-E) which is compulsory and selecting one question each from section A-D.

x-x-x

**Section A**

- I. (a) Explain the main features of Client Side Scripting. Also explain the scenarios in which it should be preferred to Server Side Scripting.  
(b) Explain the use of constants, variables and datatypes in PHP with the help of examples. (7, 6)
- II. (a) Explain the syntax and usage of various decision making constructs available in PHP.  
(b) Write a program in PHP that displays the Multiplication Table of a number N. (7, 6)

**Section B**

- III. (a) How are functions created and invoked in PHP? Write a PHP function that finds the sum of N even numbers.  
(b) How recursion is used in PHP? Explain with suitable example. (7, 6)
- IV. (a) Explain the syntax and usage of Multidimensional Arrays in PHP. Give examples.  
(b) Explain the syntax and usage of any three string functions. (7, 6)

**Section C**

- V. How are HTML Form controls connected to a database in PHP? Consider any suitable example to explain. (13)
- VI. Write SQL queries to fetch, edit and delete records in a dataset of an employee table having fields- empcode, ename, dob, qualification and salary. (13)

**Section D**

- VII. (a) What do you understand by Cookies? Create a cookie named "user" with the value "Sushma Kohli" that expires after 15 days. How will this cookie be available in entire website? Also write code to retrieve it in PHP?  
(b) What is a Session? Write PHP code to show all the session variable values for a user session. (7, 6)
- VIII. Describe the PHP functions for the following: -  
a. Opening and Closing a File  
b. File reading and writing (7, 6)

P.T.O.

(2)

Section E

IX. Write short answers.

- i. Differentiate between print and echo statements used in PHP.
- ii. Differentiate between Actual and Formal parameters.
- iii. Explain the operator precedence and associativity in PHP.
- iv. What is a Session Cookie?
- v. How are comments written in PHP?
- vi. Describe the role of get and post methods in an HTML form.
- vii. What is a Dataset?

(6\*2+1)

x-x-x