BC-3871

BCA (Semester-V) Exam.–2016

Introduction to DBMS

Time : Three Hours
Maximum Marks : **75**

Note : Attempt questions from all sections.

SECTION - A

(Short-answer Type Questions)

Note : Attempt **any ten** questions. Each question carries 3 marks. 3×10=30

[P. T. O.

1. Define the term DDL and DML.

2. Explain three level of architecture of DBMS.

3. Define the term generalization and specialization with a proper diagram.

4. Write a SQL to create table. Assume attributes yourself.

5. What do you mean by functional dependency?

6. Differentiate among the primary key, candidate key and super key.

7. Draw an ER diagram of the registration process of the student in a particular course.

8. Define the terms : Referential integrity, and Domain constraints.

9. What are the different type of joms?

10. What do you mean by attributes? List various tuypes of attributes.

11. Write down the advantages of DBMS over file system?

12. What is redundancy? What are the problems

associated with redundancy?

13. Explain the distinction between disjoint and overlapping constraints with an example.

14. In what sense relational calculus differ from relational algebra?

15. What is view? List two reasons why we may choose to define a view?

SECTION - B

(Long Answer type questions)

Note : Attempt **any three** questions. Each question carries 15 marks. 3x15=45

1. R{A→BCDE, B → ACDE, C → ABDE} Give the looseless decomposition of R.

2. Why 4NF is more desirable than BCNF? Explain in detail.

3. Using the knowledge of college environment, determine functional dependencies that exists in the following table. After these have determined convert this table to an equivalent collection of tables that are in 3NF :

Student [(Std-ID, Std-Name, Number-Credit,

Admission-No, Admission-Name,

Dept. No., Dept.-Name)

(Course No., Course-description,

Course-term, Grade)]

4. Explain notions of transparency and autonomy? Also explain multimaster replication.

5. Given the relation R(ABCDEF) with the set H = {A→CE, B→D, C→ADE, BD→F}

Find the closure of BCD.

6. Write notes on the following :

(i) Aggregation

(ii) Query Processor

(iii) Scheme & Instance

(iv) Database Security

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Roll No. ..... [Total No. of Pages : 3

BC–3871

B. C. A. (Fifth Semester)

EXAMINATION, 2019

INTRODUCTION TO DBMS

Time : Three Hours

Maximum Marks : 75

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 3 marks. 10×3=30

1. What do you mean by data integrity ?
2. State and explain 3rd Normal Form.
3. What is tuple, attribute and an entity ?

4. What is Join Dependency ? Illustrate with example.
5. Explain, how weak entity is different from strong entity.
6. Define the concept of hashing.
7. Define database recovery.
8. Discuss self-join with example.
9. What is the domain of an attribute ? Give example.
10. Define database security.
11. Discuss database users.
12. Discuss database anomalies with the help of example.
13. Discuss the concept of primary key and candidate key.
14. Explain the term multi-valued dependency.
15. What are the different security threats ?

Section—B

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 15 marks. 3×15=45

1. What is the purpose of join operation in relational algebra ? Explain different types of joins with suitable examples.
2. What do you mean by database security ? Discuss various mechanisms used for securing database.
3. What is meant by DBMS ? Draw the overall structure of DBMS with all of its components in detail.
4. What is Database Administrator ? Explain responsibilities of DBA in detail.
5. What is the need of concurrency control ? Explain different concurrency control techniques.
6. Define Hashing. What do you mean by Hash function ? Discuss and explain, how collision occurs and different collision resolution techniques ?

Roll No. ..... [Total No. of Pages : 4

BC–53/3873

B. C. A. (Fifth Semester)

EXAMINATION, 2019

COMPUTER NETWORK

Time : Three Hours

Maximum Marks : 75

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 3 marks. 10×3=30

1. What is Network Protocol ? Explain the services of network protocol.

2. What is physical media ? Explain the types of physical media.

3. What is ISP ? Explain the types of ISP as you know.

4. A channel has a bandwidth of 5 kHz and a signal to noise power ratio of 63. Evaluate the bandwidth required. If the S/N power ratio is reduced to 31, what will be the signal power required if the channel bandwidth is reduced to 3 kHz ?

5. The code word is received as 1100100101011. Check whether there are errors in the received codeword, if the divisor is 10101. (The divisor corresponds to the generator polynomials).

6. What is switching technique in Computer Network ? Give any *two* differences between packet and circuit switching technique.

7. Explain any *three* protocols and services of transport layer.

8. What are the routing algorithm ? Give any *three* types of routing algorithm.

9. What are the routing components ? Explain it.

10. What is LCP ? Explain the packet header format of LCP.
11. Explain types of IP Address.
12. Explain synchronous and asynchronous protocol in detail.
13. Explain infrared as wireless transmission.
14. Explain Intranet and Extranet in detail.
15. Differentiate between co-axial cable and twisted pair cable.

Section—B

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 15 marks. 3×15=45

1. Attempt any *three* questions :
   (a) List different types of topologies. Explain any *two* topologies in details.
   (b) Compare ISO/OSI reference model and TCP/IP.
   (c) Explain active and passive hub.
   (d) Internetwork and Internetworking Devices.

2. Describe about the following :

   (i) NCP

   (ii) PAP

   (iii) CHAP

3. Describe the following :

   (a) Go back N ARQ Protocol

   (b) Selective Repeat Protocol

4. Write short notes on the following :

   (a) CRC and LRC

   (b) Check sum

   (c) Parity Code

5. What is multiplexing and demultiplexing application in transport layer ? Explain with suitable diagram.

6. Describe about the following :

   (a) Attenuation

   (b) Distortion

   (c) Noise

Roll No. ..... [Total No. of Pages : 4

BC–52/3872

B. C. A. (Fifth Semester)

EXAMINATION, 2019

JAVA PROGRAMMING AND DYNAMIC WEB PAGE DESIGN

Time : Three Hours

Maximum Marks : 75

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 3 marks. 10×3=30

1. "Java is internet programming language." Justify it.

2. How to create double dimensional array in Java ? Give the example.
3. Discuss Thread's states.
4. What is importance of JSP ?
5. Explain different types of exceptions.
6. Write the steps to create database connectivity.
7. What is the role of drivers in Java ?
8. What is the use of network layer in TCP/IP ?
9. Define Imagemaps with example
10. Discuss Applet life cycle.
11. Describe HTTP Servlet.
12. WAP to perform basic addition of two numbers using user defined package.
13. WAP to input first name and last name and print full name by using appropriate string method ?
14. How to create image element in HTML ? Give the example.

15. Create HTML page to display list of employee's name and department name where employees work. Employee's name are ordered and department name are displayed in unordered manner.

Section—B

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 15 marks. 3×15=45

1. Differentiate String and StringBuffer object. Also discuss all methods of String and StringBuffer class with suitable example.
2. Design an interface which contains four buttons labelled with different color's name. Apply click event that changes color of the frame respectively (background color).
3. What is form in HTML ? Design login form using HTML elements.
4. Explain the life cycle of JSP. Also discuss JSP tags with suitable example.

5. Write short notes on the following :

   (a) Request Object

   (b) Response Object

   (c) Session Tracking

6. WAP to input a sentence string and perform the following string operations :

   (i) Count member of characters in a string.

   (ii) Count number of vowels present in a string.

   (iii) Convert it into sentence case.

Roll No. ..... [Total No. of Pages : 7

BC–54/3874

B. C. A. (Fifth Semester)

EXAMINATION, 2019

NUMERICAL METHODS

Time : Three Hours

Maximum Marks : 75

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 3 marks. 3×10=30

1. Show that $E \equiv e^{hD} \equiv 1 + \Delta$, where D is the differential operator of differential calculus.
2. Evaluate :

$$\Delta^2(\cos 2x)$$

3. A second degree polynomial passes through points (0, 1), (1, 3), (2, 7) and (3, 13). Find the polynomial.

4. State True *or* False :

(i) The technique of obtaining the most likely estimate of a certain quantity under certain assumptions is called interpolation.

(ii) The determination of value $f(y)$ at any point y inside the interval $[x_1, x_n]$ is called extrapolation.

(iii) The nth divided differences of a polynomial of the nth degree are constant.

5. Find the third divided difference with arguments 2, 4, 9, 10 of the function $f(x) = x^3 - 2x$.

6. The observed values of a function are 168, 120, 72 and 63 respectively at the four positions 3, 7, 9 and 10 of the independent variable. What is the best estimate you can give for the value of the function at the position 6 of the independent variables ?

7. By means of Langrange's formula, prove that :

$$y_1 = y_3 - 0.3(y_5 - y_{-3}) + 0.2(y_{-3} - y_{-5})$$

approximately.

8. Prove that :

$$\Delta \equiv \frac{1}{2}\delta^2 + \delta\sqrt{\left(1+\frac{\delta^2}{4}\right)}.$$

9. Use Stirling's formula to find y_{35}, given $y_{20} = 512, y_{30} = 439, \; y_{40} = 346, y_{50} = 243.$

10. Using the starting value $x_0 = i$, find a zero of $x^4 + x^3 + 5x^2 + 4x + 4 = 0$.

11. A river is 80 feet wide. The depth d (in feet) of the river at a distance x from one bank is given by the following table :

x	d
0	0
10	4
20	7
30	9
40	12
50	15
60	14
70	8
80	3

Find approximately the area of the cross-section of the river using Simpson's '$\frac{1}{3}$' rule.

12. If the third order difference is constant, prove that :

$$\int_0^2 U_x\,dx = \frac{1}{24}\left[U_{-1/2} + 23U_{1/2} + 23U_{3/2} + U_{5/2}\right].$$

13. Show that $y_h = \frac{1}{2}h(h-1)$ is a solution of the difference equation $y_{h+1} - y_h = h$.

14. Solve :

$$y_{h+2} + 6y_{h+1} + 25y_h = 0.$$

15. Transform the following matrix to tri-diagonal form :

$$A = \begin{bmatrix} 1 & 2 & 4 \\ 2 & 1 & 2 \\ 4 & 4 & 1 \end{bmatrix}$$

Section—B

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 15 marks. 3×15=45

1. State and prove Bessel's Interpolation formula.

2. Find the root of $x^2 - 5x + 2 = 0$ correct to five decimal places which lies between 4 and 5 by using Newton-Raphson method.

3. State and prove Fundamental theorem of the difference calculus.

4. Evaluate the value of the integral :

$$\int_{0.2}^{1.4} (\sin x - \log_e x + e^x)\, dx$$

by :

(i) Trapezoidal rule

(ii) Simpson's $\frac{1}{3}$ rule

(iii) Simpson's $\frac{3}{8}$ rule

(iv) Weddle's rule

5. Explain Euler's method to solve ordinary differential equation :

$$\frac{dy}{dx} = f(x, y), y(x_0) = y_0.$$

6. Determine the characteristic roots and the corresponding characteristic vectors of the matrix :

$$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$