বিদ্যাসাগর বিশ্ববিদ্যালয়

VIDYASAGAR UNIVERSITY

BCA 6th Semester Examination 2022

ELECTIVE – II

PAPER–3202

Full Marks : 70

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

E-COMMERCE & ERP

Group – A

Answer any *four* questions.　　　　　　4×15

1. (a) What is the impact of internet and WWW on ERP product ?

   (b) Explain in brief, the importance of e-Business.　　　7+8

2. (a) Describe about Supply Chain Management.

   (b) Explain, in brief, the important of Supply Chain Management.　　　7+8

3. (a) Briefly discuss "Cyber Laws".

(b) Explain "Customer Premises Equipment" (CPE). 10+5

4. (a) Discuss "e-commerce vs. e-business".

(b) Write a short notes "Mobile Commerce". 9+6

5. (a) How is e-commerce helpful to the consumer ?

(b) What is C2C e-commerce ? 10+5

6. (a) Write a short notes "ERP".

(b) Discuss briefly Need for "ERP". 8+7

7. Explain various types of E-Business Models. 15

8. (a) Explain Electronic Data Interchange along with its benifits.

(b) Discuss the E-cycle of Internet Marketing. 10+5

Group – B

Answer any *one* question. 1×10

9. Briefly explain the various types of EPR Modules.

10. Explain the Four C's Rules in E-Commerce.

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ADVANCED DBMS

Group – A

Answer any *four* questions. 4×15

1. (a) What is transaction ? What are the ACID properties of transaction ?

   (b) Describe different steps of transaction.

   (c) What do you mean by data warehousing ? (2+4)+6+3

2. (a) Explain the concept and relevance of serializability.

   (b) What are the advantages of using B+ Tree over B tree ?

   (c) What is Database recovery ?

   (d) What are the major functions of the database administrator ? 6+3+3+3

3. (a) Explain the terms 'Partial functional dependency' and 'non-transitive dependency' with example.

   (b) Given a relational schema Supply (Sno, city, status, pno, qty) with FD set F = {Sno → city, city → status, (Sno, pno) → qty}. Find the key of the schema. Also reduce it into 3NF.

   (c) Briefly explain timestamp protocols for Concurrency Control. 4+7+4

4. (a) Explain two phase locking protocol.

   (b) Define the concept of Generalization, Specialization and Aggregation.

   (c) Write short note on Armstrong's axioms. 4+6+5

5. (a) What is meant by check-point's entry in system log ?

    (b) Describe the state diagram of transaction.

    (c) What is foreign key ? What are the advantages of BCNF over other normal forms ? 4+4+(2+5)

6. (a) Write down the main difference between DBMS and RDBMS.

    (b) Explain the mechanism of log based and shadow paging database recovery technique. 3+(6+6)

7. (a) What is data fragmentation ? Describe horizontal and vertical fragmentation. Explain with an example.

    (b) What do you mean by distributed database design ? What strategies and objectives are common to most of DDBMS ?

    (c) What is data replication ? Why is data replication useful in DDBMS ?

    (2+4)+(2+3)+(2+2)

8. Write short note (any *three*) :

    (a) Database security ;

    (b) Object Oriented Database ;

    (c) DKNF ;

    (d) Spurious tuples and Dagling tuples ;

    (e) Relational Alzebra. 3×5

Group – B

Answer any *one* question. 1×10

9. (a) Discuss "insertion anomalies" with an example. Suggest a method to overcome it.

   (b) Define the following terms :
   Primary Key, Composite Key and Unique Key. 4+2×3

10. (a) With suitable examples show how recovery in a database system can be done using LOG file with —
    (i) Immediate updation,
    (ii) Differed updation.

    (b) Define MVD with suitable example. 2×3+4

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DATA WAREHOUSE

Group – A

Answer any *four* questions. 4×15

1. (a) What are the various types of OLAP servers ? Explain.

   (b) Describe the different measures of multidimensional data model.

   (c) Describe the process of data cleaning. 5+5+5

2. (a) Discuss about a three-tier data warehouse architecture.

   (b) What is the curse of dimensionality ? How to reduce it ?

   (c) What are the typical methods for data discretization ? Discuss.　　　5+5+5

3. (a) Compare and contrast operational database systems with data warehouse.

   (b) What is constraint based association mining ? Discuss with example.

   (c) Discuss cluster analysis.　　　5+5+5

4. (a) Compare multidimensional and multievel association mining.

   (b) What are the different characteristics of a Data Warehouse ?

   (c) What is the importance of data marts in data warehouse ?　　　5+5+5

5. (a) What is classification and prediction ? Explain.

   (b) Discuss about Naive Bayesian Classification.

   (c) Discuss about K-nearest Neighbor classifiers.　　　5+5+5

6. (a) What is the main objective of clustering ? Give the categorization of clustering approaches. Briefly discuss them.

   (b) What do you mean by fuzzy set approach in data mining.　　　(5+5)+5

7. (a) What is classifier accuracy in data mining ?

   (b) Differentiate between data retrieval and data mining.

   (c) Briefly describe a clustering process.　　　5+5+5

8. (a) What is Association Analysis ? Explain Association Rule, Support and confidence.

(b) Write short note on Advance Database System.   (2+8)+5

Group – B

Answer any *one* question.   1×10

9. Write the algorithm for decision tree induction. Discuss with example.   10

10. What is Data mining query language ? What is Concept Description ?   5+5

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ADVANCED NETWORKING

Group – A

Answer any *four* questions.   4×15

1. (a) Discuss mesh topology ? What are the advantages of using mesh topology ? How many cables are needed and how many ports are needed for each device ?

(b) Write down the functionalities of transport and session layer.   (4+2+2)+7

2. (a) A signal travels through a medium and it's power is reduced to half. Determine the attenuation.

(b) Compare and contrast between Frequency division multiplexing and Time division multiplexing.

(c) What is interleaving and bitpadding in TDM ?   4+6+5

3. (a) Briefly describe OSPF routing protocol.

    (b) Write down the mechanism of RARP protocol.

    (c) What is the purpose of NIC ? Describe the function of Network Address Translator.   7+4+4

4. (a) Describe briefly HDLC frame format.

    (b) Could HDLC be used in as data link control protocol for a LAN ? Explain your answer.

    (c) What are the different classes of addresses used in IPV4 ?   6+5+4

5. (a) Give a brief comparison between I-frame and U-frame.

    (b) What do you mean by default mask ? Give example.

    (c) Differentiating between subnetting and supernetting.

    (d) What is checksum ?   6+3+4+2

6. (a) Discuss any distance vector routing algorithm.

    (b) In Go-Back-N-ARQ flow control, define and discuss the handling of a lost frame and a lost acknowledgement.   9+6

7. (a) Why the transport layer protocol like TCP and UDP called end-to-end protocols ?

    (b) Why the size of the sender window size must be less than 2^m in case of Go-Back-N-ARQ ?

    (c) Explain the three-way handshaking for connection establishment.   4+4+7

8. (a) What is socket ? Explain client and server model of sockets with diagram.

   (b) Compare between pure ALOHA and slotted ALOHA. (2+8)+5

Group – B

Answer any *one* question. 1×10

9. (a) Explain IEEE 802.3 MAC frame format.

   (b) What is DNS ? What is name space ? 5+5

10. (a) What is leaky bucket algorithm ? Discuss Token Bucket algorithm ?

    (b) Differentiate between stop and wait protocol and sliding window protocol.

    5+5

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ADVANCED OS

Group – A

Answer any *four* questions. 4×15

1. (a) Explain two-phase commit protocol.

   (b) How does one measure the performance of mutual exclusion algorithm ?

   7+8

2. (a) Write down the difference between logical clock and physical clock.

(b) How are the semaphores used to solve producer-consumer problem ?

(c) What is deadlock ? How deadlock situation is handled ?   3+6+6

3. (a) Discuss the Bully's algorithm.

(b) Write a short note on distributed shared Memory.   8+7

4. What is distributed OS ? Briefly explain the design issues of distributed OS. What are the advantages and shortcomings of distributed OS over the centralized system ?   2+7+(3+3)

5. What is IPC ? Explain the differences between synchronous and asynchronous communication. What do you mean by encoding and decoding of message data ? How stream comunication differs from datagram ? Briefly explain. What are the features of good message passing system ?   2+5+4+4

6. Briefly explain the features of a good global scheduling algorithm. What is process migration ? Briefly explain. Describe the deadlock handling strategies in distributed systems.   5+5+5

7. Explain the components of a distributed file system. What is an immutable file ? Can a file system be designed to function correctly by using only immutable files ? Explain. Justify the following statement. In the design of a distributed file system, high performance and high reliability are mutually related properties.

     5+(2+3)+5

8. Write short notes on any *three* of the following :　　　　　　3×5

(a) Stub procedure ;

(b) Lamport's Distributed Mutual Exclusion Algorithm ;

(c) IPC ;

(d) RPC messages ;

(e) Micro kernel and Monolithic kernel ;

(f) Digital signature.

Group – B

Answer any *one* question.　　　　　　1×10

9. What is path pushing ? What is the difference between active time server and passive time server algorithms ? What is drifting of clocks ? What do you mean by multidatagram messages ?　　　　　　2+3+2+3

10. (a) Compare reusable and consumable resources.

(b) Discuss in detail about the light weight process and its different levels.

　　　　　　4+6

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PHP/MySQL

Group – A

Answer Q. No. *1* and any *four* from the rest.

1. (a) How does webserver differ from website ?   2

   (b) What do you understand by full stack developer ?   2

   (c) Name two front end software and two back end software.   2

   (d) What is the full form of PHP ?   1

   (e) List out two advantages of using PHP.   2

   (f) What do you mean by WAMP and LAMP ?   2

   (g) How can we make a single-line comment and multi-line comment in PHP ?
                                                                                   2

   (h) How can we delete a table named "STUDENT" in MySQL ?   2

2. (a) List out four different functionalities of PHP.

   (b) Explain the steps to establish a connection with MySQL database from PHP
       code.   5+10

3. (a) Write a PHP code to read user id (an email address) and password (of at least
       six characters). Check if the user id input contains valid domain name such
       as *@gmail.com* or *@vidyasagar.ac.in.* Check if the user password is at least six
       characters long. Also make sure that * is displayed in the password field
       when user is entering password characters.

   (b) What is the use of cookie ?   10+5

4. (a) How can we work with 1-D array in PHP ?

(b) How does GET and POST help in interacting with forms ?

(c) How to display present date in *dd-mm-yy* format in PHP ?   5+5+5

5. (a) Write a MySQL query that displays all the students who scored more than 60% of total marks in fifth semester examination and has not failed in any paper due in fifth semester. Assume the STUDENT database has the following attributes : Name, Roll, Semester, Paper 1 Marks, Paper 2 Marks, Paper 3 Marks, Paper 4 Marks. Assume that if a student scores less than 40 out of 100 then that is considered as fail.

(b) Discuss the functions : (i) str_replace(.) (ii) a sort ( ).   9+6

6. (a) Illustrate the support object-oriented programming in PHP with a simple example.

(b) What is the full form of CSS ? How does CSS help in designing website ?

(c) Can we use CSS from PHP ? Justify with example.   5+(1+4)+(1+4)

7. (a) Mention some important features of MySQL.

(b) Show the code to implement natural join to join multiple tables in MySQL. Assume necessary table structures for your code and mention those table structures.   5+10

8. (a) Design a webpage using HTML with three fields to insert a student data.

(b) What are the different functions to fetch data in a PHP page from MySQL ?
          7+8

Group – B

Answer any *one* question.   1×10

9. What is a CSS ? Briefly explain difference types of CSS with example.   2+8

10. What is a session ? When should we use session ? Give an example to demonstrate the use of session.   2+3+5

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IMAGE PROCESSING AND PATTERN RECOGNITION

Group – A

Answer any *four* questions.   4×15

1. (a) What is Digital Image ? What is Pixel ? What is Digital Image processing ?

   (b) What is the basic difference between the lens of eye and ordinary optical lens.

   (c) Explain the term Aliasing and Moire Pattern.   (3×2)+4+5

2. (a) Describe the basic gray level image transformation used in image processing.

   (b) Explain CMY color model.   8+7

3. Specify the following properties of 2D Fourier transformation :   5×3

   (i) Translation ;

   (ii) Scaling ;

   (iii) Rotation ;

   (iv) Periodicity ;

   (v) Separability.

4. What is weber ratio ? How to increase the quality of an image ? What is Pattern Recognition ? What is Training and Learning in Pattern Recognition ?

3+2+2+8

5. Write short notes on any *five* : 5×3

(a) Ideal High Pass Frequency domain filter ;

(b) Convolution theorem ;

(c) Pattern Recognition and Applications ;

(d) FFT ;

(e) Sampling and quantization ;

(f) Thresholding ;

(g) Image Negative.

6. (a) Explain different Phases in Pattern Recognition System.

(b) Define :
(i) Resolution ; (ii) Adjacency ; (iii) Spatial. 6+(3×3)

7. (a) Describe different type of smoothing Filtering.

(b) Write a short note :
(i) Ideal Light Pass filter (IHPP) ;
(ii) Gaussian High pass Filtering. 7+(4×2)

8. Explain morphological image processing. Explain different operators are used morphological image processing. 7+8

Group – B

Answer any *one* question. 1×10

9. (a) Explain different Phases in Image processing System.

(b) What is edge detection in image processing. 6+4

10. (a) What is image segmentation ? Mention application of image segmentation.

(b) Difference between Digital Image and Binary Image. (3+4)+3

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