## B.Sc. (CBCS) III - Semester Examination, November/December 2024

#### Subject: Computer Science Paper – III : Data Structure using C++

Time: 3 Hours

Max. Marks: 80

(8x4=32 Marks)

#### PART – A Note : Answer any Eight questions.

- 1. What is data structure? Give examples.
- 2. Write about analysis of algorithms.
- 3. Write the applications of stack.
- 4. Write about Recurrence.
- 5. What is a circular queue?
- 6. What is a linked stack?
- 7. Write ADT for Binary Tree.
- 8. Write short notes on linear search.
- 9. Write about symbol table.
- 10. Write short notes on Depth First Search.
- 11. Write about Hash table overflow.
- 12. Write the applications of Heap.

## PART – B

## Note : Answer all the questions.

(4x12=48 Marks)

13.a) Explain the different types of data structures with suitable examples.

## OR

- b) Write a program to evaluate an expression by using stack data structure.
- 14.a) Compare Iteration and Recursion. Explain the use of stack in Recurrence with implementation.

## OR

- b) Explain the linked list variants with suitable examples.
- 15.a) Explain the different types of trees with an example for each and write the applications of binary trees.

## OR

- b) Compare the various sorting algorithms with advantages and disadvantages for each sorting technique.
- 16.a) Explain Spanning tree using Prim's algorithm.

## OR

b) Explain the implementation of heaps with an example and write its applications.

B.Sc. (CBCS) III - Semester Examination, November/December 2024

Subject: Clinical Nutrition And Dietetics Paper – III: Basic Dietetics

## **Time:3 Hours**

PART – A

(8x4=32 Marks)

Max. Marks: 80

(4x12=48 Marks)

## Note : Answer any Eight questions.

- 1. Write a note on Soft Diet.
- 2. What are therapeutic diets ?
- 3. What are the advantages and limitations of Enteral Nutrition ?
- 4. Describe the dietary modification in hepatitis A.
- 5. What are the causes for cirrhosis of liver?
- 6. Explain low Calone diet.
- 7. Explain Glucose Tolerance Test.
- 8. Define Peptic ulcer.
- 9. Explain Type-I diabetes.
- 10 What are the risk factors for Atherosclerosis?
- 11. Describe the types of Hypertension.
- 12. What are the causes and symptoms of nephrotic syndrome?

## PART – B

## Note : Answer all the questions.

13. a) Explain in detail the Routine Hospital diets.

#### OR

- b) Explain the role of a dietitian in a hospital.
- 14.a) Give the dietary modification in febrile conditions.

#### OR

- b) What are the causes and dietary management in Hepatitis.
- 15.a) Describe the symptoms, causes and dietary management in Diabetes mellitus.

#### OR

- b) Write in detail the dietary management for liver Cirrhosis.
- 16.a) Explain the importance of Dietary counseling and the steps in counseling process.

#### OR

b) Describe the causes, symptoms and dietary management in glomerulorephritis.

## B.Sc. (CBCS) III - Semester Examination, November/December 2024

#### Subject: Applied Nutrition And Public Health Paper – III : Food Science and Technology

#### Time: 3 Hours

## PART – A

Max. Marks: 80

(4x12=48 Marks)

(8x4=32 Marks)

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## Note : Answer any Eight questions.

- 1. What are the objectives of different Cooking methods?
- 2. Write the nutritive values of Jowar.
- 3. Write the composition of Cereals.
- 4. What is the role of legumes in cookery?
- 5. Write the processing of legumes.
- 6. Explain the processing of khoa.
- 7. Explain processing of wine.
- 8. Discuss Medical values of turmeric.
- 9. List out various spices and condiments.
- 10. What are the Pigments and organic acids of vegetables.
- 11. Write the classification of fruits.
- 12. Explain the types of fats and oils.

## PART – B

## Note : Answer all the questions.

13.a) Give a brief note on the milling of wheat and corn.

## OR

- b) Describe the role of gluten in dough formation and factors effecting gluten formation.
- 14.a) Explain the types composition and nutritive value of milk.

## OR

- b) Discuss the different types of fermented and non fermented milk products.
- 15.a) Write the classification, types of fish along with factors considered while selection of fish.

#### OR

- b) Discuss the source, types and nutritive value of meat.
- 16.a) Discuss the spoilage observed in Fats and oils.

## OR

b) Write the flavor constituents, polyphenols and changes during repining of fruits.

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## B. Sc. (CBCS) III - Semester Examination, November/December 2024

## Subject: Biotechnology

Paper – III: Molecular Biology and Recombinant DNA Technology Time: 3 Hours Max. Marks: 80

PART – A

Note: Answer any eight questions.

- 1. Describe briefly Hershey Chase experiment.
- 2. Write about the genetic material in TMV.
- 3. Briefly explain about chloroplast genome.
- 4. Describe briefly about prokaryotic gene.
- 5. Discuss in brief the function of RNA Polymerase.
- 6. Write about rho dependent termination.
- 7. Write about post transcriptional modifications.
- 8. Discuss in brief about alternate splicing.
- 9. Write briefly about Gal regulation in Yeast.
- 10. Discuss briefly about DNA Ligase.
- 11. Write a brief note on cloning vectors.
- 12. Write about significance of colony hybridization.

## PART – B

## Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Describe in detail the nuclear genome replication in eukaryotes.

## (OR)

- (b) What are mutations? Explain in detail the spontaneous and induced mutations.
- 14. (a) Discuss in detail about transcription process in eukaryotes.

#### (OR)

- (b) Describe in detail about genetic code. Add a note on wobble hypothesis.
- 15. (a) Explain in detail about post transcriptional regulations in prokaryotes.

#### (OR)

- (b) Discuss about post translational modifications in eukaryotes.
- 16. (a) Describe about the various gene transfer techniques.

#### (OR)

(b) What are the applications of Recombinant DNA technology in medicine?

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 $(8 \times 4 = 32 \text{ Marks})$ 

## B. Sc. (CBCS) III-Semester Examination, November/December 2024

Subject: GEOLOGY	
Paper - III : Petrology	

#### **Time: 3 Hours**

Max. Marks: 80

## PART – A

(8x4=32 Marks)

- Note : Answer any Eight questions.1. Definition of rock.
- 1. Deminion of fock.
- 2. Phacoliths and batholith.
- 3. Block lava and ropy lava.
- 4. Syenite and pyroxenite.
- 5. Trachyte and andesite.
- 6. Uni-component binary system.
- 7. Modes of transportation of sediments.
- 8. Deformed bedding solution structures.
- 9. Conglomerate and breccia.
- 10. Grades and zones of metamorphism.
- 11. Stress and antistress minerals.
- 12. Gneiss and schists.

# PART – B

## Note : Answer all the questions.

(4x12=48 Marks)

- 13.a) Give a detailed account on classification of rocks.
  - b) Write an essay on textures of igneous rocks.
- 14. a) Write an essay on Tyrrell tabular classification of igneous rocks.

## OR

- b) Write an essay on origin of igneous rocks by Bowen's reaction principle.
- 15.a) Write an essay on sources of sediments for formation of sedimentary rocks.

OR

- b) Write an essay on classification of sedimentary rocks with suitable Examples.
- 16.a) Write an essay on classification of metamorphic rocks.

## OR

b) Describe the different structures of metamorphic rocks with neat diagrams.

B.Sc. (CBCS) III - Semester Examination, November/December 2024

## Subject : Genetics

Paper – III : Biostatistics and Bioinformatics

**Time:3 Hours** 

#### PART – A

Note : Answer any Eight questions.

- 1. What is sampling error, and how can it affect data analysis?
- 2. Differentiate between ordinal and nominal data with examples.
- 3. Discuss about standard deviation and its importance in data analysis.
- 4. What are the applications of the chi-square test?
- 5. What is Analysis of Variance (ANOVA)? Explain with an example.
- 6. Explain the difference between one-tailed and two-tailed test in hypothesis testing.
- 7. Describe the main features of the ExPASy bioinformatics portal.
- 8. What is the significance of downloading and using free bioinformatics software?
- 9. Explain the classification of DNA sequence databases with examples.
- 10. What is a dot matrix method, and how is it used in sequence alignment?
- 11. Explain the terms "Match", "mismatch", and "gap" in sequence alignment.
- 12. Describe the BLAST algorithm and its importance in sequence similarity searches.

## PART – B

## Note : Answer all the questions.

13.a) Discuss the methods of data tabulation and graphical representation, including their advantages and limitations for different types of data.

## OR

- b) Explain about the measures of dispersion and their relevance interpreting data spread.
- 14.a) What is chi-square test? Elaborate on its applications in testing goodness of fit in biological data.

# ORb) Explain the concept of correlation and regression analysis in detail.

15.a) Describe the roles and significance of biological databases like SwissProt and PROSITE in protein research.

#### OR

- b) Explain the use of bioinformatics tools and resources, highlighting the role of NCBI databases in data analysis and research.
- 16.a) Discuss the significance of scoring matrices (PAM and BLOSUM) in sequence alignment and their application in biological studies.

## OR

b) Describe the different types of phylogenetic trees and the steps involved in constructing a phylogenetic tree using character-based methods.

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## (4x12=48 Marks)

(8x4=32 Marks)

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Max. Marks: 80

B.Sc. (CBCS) III - Semester Examination, November / December 2024

#### Subject: Nutrition And Dietetics Paper – III : Normal and Therapeutic Nutrition

## Time: 3 Hours

PART – A

Max. Marks: 80

(8x4=32 Marks)

## Note : Answer any Eight questions.

- 1. What are the factors affecting RDA?
- 2. Enumerate the RDA for an adult man, heavy worker.
- 3. What is toxemia?
- 4. What is supplementary feeding? Discuss the precautions to be taken.
- 5. Describe the advantages ICDS.
- 6. Discuss the dietary modifications for the geriatric group.
- 7. Write the advantages and limitations of dietary supplements.
- 8. Explain the different types of enteral feeds.
- 9. Explain the dietary modifications in tuberculosis.
- 10. Define fever. Explain its exogenous causes.
- 11. Define lactose intolerance. Explain the symptoms of the same.
- 12. Explain the symptoms and dietary management in galactosemia.

## PART – B

## Note : Answer all the questions.

(4x12=48 Marks)

13.a) Explain in detail the principles and steps in meal planning.

## OR

- b) What is the RDA for a lactating woman? Explain the role of hormones in milk production.
- 14.a) Discuss breast feeding vs bottle feeding.

## OR

- b) What is the RDA of a school going 15 year old girl? Write a note on packed lunch.
- 15.a) Explain in detail the modifications of normal diet in hospitals.

## OR

- b) What are the causes, symptoms and dietary management in Typhoid?
- 16.a) What is phenylketonuria? Explain the symptoms dietary management for the same.

## OR

b) Define food allergy. What are the signs and symptoms of food allergies?

## FACULTY OF SCIENCE B.Sc. (Hons) in Computer Science (CBCS) III – Semester Examination, November/ December 2024

#### **Subject: Discrete Mathematics**

Max. Marks: 80

## Time: 3 Hours

#### PART – A

#### Note: Answer any eight questions.

- 1. Construct the truth table of the compound proposition  $(p \lor q) \rightarrow (p \land q)$ .
- 2. Show that the conditional statement  $[p \land (p \rightarrow q)] \rightarrow q$  is a tautology.
- 3. Translate into English the statement  $\forall x \forall y ((x > 0) \land (y < 0) \rightarrow (xy < 0))$  where the domain for both variables consists of all real numbers.
- 4. Find the number of permutations of the letters ABCDEFG containing the string BCD.
- 5. Show that  $\sum_{k=0}^{n} 2^k \binom{n}{k} = 3^k$  where *n* is a non-negative integer.
- 6. Find the number of ways to place 10 indistinguishable balls into 8 distinguishable bags.
- 7. Solve the recurrence relation  $a_n = a_{n-1} + n$  where  $a_0 = 2$  by substitution method.
- 8. Find the general solution of  $a_n 8a_{n-1} + 16a_{n-2} = 0$ .
- 9. Show that  $F_0 + F_2 + F_4 + \dots + F_{2n} = F_{2n+1}$  where  $F_n$  denotes  $n^{th}$  Fibonacci number.
- 10. Define complete graph and give an example.
- 11. Define bipartite graph and give an example.

Note: Answer all the questions.

12. In every non trivial tree, show that there is atleast one vertex of degree 1.

# PART - B

#### $(4 \times 12 = 48 \text{ Marks})$

13. a) (i) Show that  $(p \rightarrow q) \lor (p \rightarrow r)$  and  $p \rightarrow (q \lor r)$  are logically equivalent.

(ii) If n = ab where a and b are positive integers, then show that  $a \le \sqrt{n}$  or  $b \le \sqrt{n}$ . (OR)

b) Find the sum-of-products expansion for the function  $F(x, y, z) = (x + y)\overline{z}$ .

- 14. a) (i) Find the coefficient of  $x^7y^6$  in the expansion of  $(4x 3y)^{13}$ .
  - (ii) If *n* and *r* are non-negative integers with  $r \le n$ , then show that  $\binom{n+1}{r+1} = \sum_{j=r}^{n} \binom{j}{r}$ .

#### (OR)

- b) Find the number of solutions to the equation  $x_1 + x_2 + x_3 + x_4 + x_5 = 22$  where  $x_i$  is a non-negative integer for i = 1,2,3,4,5 such that (i)  $x_i \ge 1$  (ii)  $x_i \ge 2$  for i = 1,2,3,4,5.
- 15.a) Using generating function, solve the recurrence relation  $a_n 10 a_{n-1} + 21a_{n-2} = 3^{n-2}$  for  $n \ge 2$  and  $a_0 = 1$ ,  $a_1 = 10$ .

#### (OR)

- b) Solve the divide and conquer relation  $a_n = 5a_{\frac{n}{2}} + 4$  where  $a_1 = 0$  and  $n = 2^k$  for k > 0.
- 16.a) In a graph *G*, show that every u v path contains a simple u v path.

b) Show that a tree with n vertices has exactly (n - 1) edges.

 $(8 \times 4 = 32 \text{ Marks})$ 

Code No. G-9216

## FACULTY OF SCIENCE

## B.A / B.Sc. (CBCS) III - Semester Examination, November / December 2024 Subject: Computer Applications

Paper – III : Relation Data Base Management Systems

## Time: 3 Hours

## PART – A

Max. Marks: 80

 $(8 \times 4 = 32 \text{ Marks})$ 

## Note: Answer any eight questions.

- 1. Define database
- 2. Write about Relational Operators
- 3. Explain attributes and its types
- 4. What is Normalization?
- 5. Discuss Hashed file
- 6. What is an Entity integrity?
- 7. Unary operators with examples
- 8. Explain Revoke and commit
- 9. What is Trigger?
- 10. Write short notes Database security
- 11. Discuss Transaction and its states
- 12. What are Database errors?

## PART – B

## Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) What id DBA? What are the roles and functions of DBA?

## (OR)

- (b) Explain Entity-Relationship (ER) model for University Database.
- 14. (a) Explain types of file organizations.

## (OR)

- (b) Explain 1NF, 2NF, 3NF and BCNF with examples.
- 15. (a) Briefly explain about DML and DCL commands related examples.

## (OR)

- (b) Explain Triggers and Cursors in SQL.
- 16. (a) What is transaction? Explain ACID properties.

## (OR)

(b) Explain different types of Backup and recovery techniques.