

9. Explain the following with examples :

(a) Recurrence relations and their uses.

10

(b) Fibonacci numbers and their advantages.

6

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Roll No. ....

**97667**

**BCA 2nd Semester**

**Examination – July, 2022**

**MATHEMATICAL FOUNDATION OF COMPUTER**

**SCIENCE**

Paper : BCA-108

Time : Three hours ]

[ Maximum Marks : 80

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory.*

1. Answer the following questions briefly :  $2 \times 8 = 16$

(a) Define Mode.

(b) What is Big Oh notation ?

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P. T. O.

- (c) Describe binary tree.
- (d) What is GCD ?
- (e) Explain degree of a vertex in a graph ?
- (f) What is worst case in an algorithm ?
- (g) Write *two* applications of trees.
- (h) What is regression ?

**UNIT - I**

- 2. What is correlation ? How is it useful and calculated ?  
Discuss its applications with examples.      8, 8
- 3. Explain the following briefly with suitable examples :
  - (a) Variance and its calculation and uses.      8
  - (b) Preparation of frequency distribution table and its uses.      8

**UNIT - II**

- 4. What is binary search ? How is it useful and used ?  
Explain its complexity with examples.      8, 8

- 5. Describe the following with examples :

- (a) Logarithmic algorithms and their uses.      8
- (b) Hamiltonian path circuit and its applications.      8

**UNIT - III**

- 6. What is sorting ? How is it useful ? Explain algorithm and complexity of merge sort with suitable examples.      6, 10

- 7. Explain the following with examples :

- (a) Recursion and its merits and applications.      8
- (b) Spanning trees and their applications.      8

**UNIT - IV**

- 8. What is encryption ? How is it used ? Discuss its schemes, applications and advantages with examples. 16