KCA
UNIVERSITY
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FACULTY OF COMPUTING AND INFORMATION MANAGEMENT
BSC IT/BBIT/BAC
BBIT 106/BCT 2103/BIT 3101A DATA STRUCTURES AND ALGORITHMS
MODE: FULL TIME

DATE: JUNE.2018   TIME: 3:30-4:30PM

INSTRUCTIONS: Answer all the Questions

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a) Describe the **FIVE** properties of a good algorithm.

5 Marks

b) Design an algorithm using pseudo code to convert a decimal number (base 10) to its binary equivalent.

8 Marks

c) Algorithms that use similar problem solving approach can be grouped into the same class/category. In this regard, describe the following groups of algorithms. Give example in each group.
   i.   Genetic algorithms
   ii. Greedy algorithms
   iii. Backtracking algorithms

9 Marks

d) Differentiate between linear and non-linear data structures

4 Marks

e) Explain the procedure of deleting the node that stores 8 in the linked list below.

```
┌─────┐     ┌─────┐     ┌─────┐
│  6  │ ──▶ │  8  │ ──▶ │  6· │ ──▶
└─────┘     └─────┘     └─────┘
```

6 Marks

f) Convert the following infix expressions into corresponding prefix expressions.
   i.   A+B-(C+D-E)*F
   ii. A+((B-C+D)/E)+F

8 Marks