

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SECOND SEMESTER (Second Year Direct) &
FOURTH SEMESTER MCA (Regular) DEGREE EXAMINATION, APRIL 2018
Course Code: RLMCA262
Course Name: FUNCTIONAL PROGRAMMING

Max. Marks: 60

Duration: 3 Hours

PART A*Answer all questions, each carries 3 marks.*

Marks

- | | | |
|---|---|-----|
| 1 | Explain Tail Recursion and Recursion Trees. | (3) |
| 2 | How can we use Functions as a value? Explain with suitable example. | (3) |
| 3 | What are Inverse Functions? Explain with suitable examples. | (3) |
| 4 | What do you mean by Lazy Evaluation? | (3) |
| 5 | What is an Enumerated Data Type? What are its uses? | (3) |
| 6 | What are Type Classes? Explain the usage of any three type classes. | (3) |
| 7 | Does Haskell provide any structure in which you can accommodate different values belonging to different types? If so, name and explain how to use it. | (3) |
| 8 | Write the lists generated by the following Haskell list comprehensions. | (3) |
| | i) <code>[x*3 x < - [1..10]]</code> | |
| | ii) <code>[y x < - [1..5], y < - [1..x]]</code> | |
| | iii) <code>[x x < - ['a','c'..'t']]</code> | |

PART B*Each question carries 6 marks.*

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|----|--|-----|
| 9 | a) What are the different data structures commonly used in computer programming? (Explain any 3 data structures) | (6) |
| | OR | |
| | b) What are the various data types used commonly in programming languages? (Explain any 4 types with examples) | (6) |
| 10 | a) Explain Functional Composition and the usage of Auxiliary Functions. | (6) |
| | OR | |
| | b) i) Explain Pattern Matching in Function definitions with suitable examples. | (3) |
| | ii) Explain the use of Strict Functions and Non-strict Functions | (3) |
| 11 | a) Explain any 4 operations defined over a List with examples. | (6) |

OR

- b) Explain recursion over Lists. (6)

- 12 a) Explain the use of MAP function and FILTER function on Lists. (6)

OR

- b) Explain recursion over Natural Numbers (6)

- 13 a) What are Abstract Data types? Explain using one example. (6)

OR

- b) What operations are defined on a Binary Search Tree? Explain the operations using the definition of the functions. (6)

- 14 a) How would you implement a Queue Data Structure using Haskell? (You need to insert and delete values in the data structure). (6)

OR

- b) i. Write the Haskell code using Pattern Matching to find the factorial of a number. (3)

- ii. Write the Haskell code to find the sum of even numbers from a list. (3)
