

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
T-1 EXAMINATION- SEPTEMBER 2018

COURSE NAME: PYTHON PROGRAMMING
COURSE CODE: 18B1WCI731

MAX. MARKS: 15

COURSE CREDITS: 3

MAX. TIME: 1 Hr

Note: All questions are compulsory. Carrying of a mobile phone during examinations will be treated as a case of unfair means.

Question 1:

[3x2 Marks]

- a. Write a program to transpose a matrix using nested loop(write is computation cost).
- b. Write the factorial program using Lambda (in single line).
- c. What is dictionary in Python, use suitable example to justify your answer?

Question 2:

[4 Marks]

Given a number 'n', check if n is a Fibonacci number(use functions). First few Fibonacci numbers are 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 141, .. [Hint: A number is Fibonacci if and only if one or both of $(5*n^2 + 4)$ or $(5*n^2 - 4)$ is a perfect square].

Question 3:

[5 Marks]

Heap sort is a comparison based sorting technique based on Binary Heap data structure. The steps of heap sort are as follows:

1. Build a max heap from the input data.
2. At this point, the largest item is stored at the root of the heap. Replace it with the last item of the heap followed by reducing the size of heap by 1. Finally, heapify the root of tree.
3. Repeat above steps while size of heap is greater than 1.

Write a python program to implement the Heapsort.