

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- March-April 2017

M.Tech II Semester

COURSE CODE: 11M1WCI432

MAX. MARKS: 25

COURSE NAME: Performance Evaluation of Networks

COURSE CREDITS: 03

MAX. TIME: 1.5 Hrs

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

Que.1: **[Marks-06]** Two Poisson streams merge at a disk. The pmf for the two streams are as follows:

$$f(x) = \lambda^x \frac{e^{-\lambda x}}{x!}, \quad x = 0, 1, 2, \dots, \infty$$

$$f(y) = \lambda^y \frac{e^{-\lambda y}}{y!}, \quad y = 0, 1, 2, \dots, \infty$$

Determine the following:

- a. Mean of $x + y$ b. Variance of $x + y$ c. Mean of $x - y$ d. Variance of $x - y$
 e. Mean of $3x - 4y$ f. Coefficient of variation of $3x - 4y$

Que.2: **[Marks-04]** Using a spanning-tree algorithm for cluster analysis prepare a dendrogram for the data shown in following Table. Interpret the result of your analysis.

Program Name	Function	CPU Time	I/O's
TKB	Linker	14	2735
MAC	Assembler	13	253
COBOL	Compiler	8	27
BASIC	Compiler	6	27
Pascal	Compiler	6	12
EDT	Text editor	4	91
SOS	Text editor	1	33

Que.3: **[Marks-04]** Choose a computer system or subsystem. Assume that prototypes of systems you selected already exist and you have decided to measure their performance. Make a list of quantities, if any, that you could measure using a

- a. Software monitor b. Hardware monitor c. Firmware monitor

In each case, describe how performance metrics of interest to you could be calculated using the quantities measured. Discuss how you would resolve some of the issues you would face in using or designing a monitor for your system.

Que.4: **[Marks-04]** Select an area or application of computer systems, for example, image processing, mail, networking, and medical diagnosis. List the characteristics of workloads that a load driver for that area should implement. Discuss how you would specify the required characteristics to the load driver and whether there are any difficulties in implementing it in a representative manner.

Que.5: **[Marks-04]** The measured values of the eight performance metrics listed as below for a system are 70, 10, 60, 20, 80, 30, 50, and 20%. Draw the Kiviat graph and compute its figure of merit.

The eight performance metrics:

1. CPU busy
2. CPU only busy
3. CPU and channel overlap
4. Channel only busy
5. Any channel busy
6. CPU wait
7. CPU in problem state
8. CPU in supervisor state

Que.6: **[Marks-03]** The number of disk I/O's performed by a number of programs were measured as follows: {23, 33, 14, 15, 42, 28, 33, 45, 23, 34, 39, 21, 36, 23, 34, 36, 25, 9, 11, 19, 35, 24, 31, 29, 16, 23, 34, 24, 38, 15, 13, 35, 28}. Which index of central tendency would you choose and why?