National University

of Computer & Emerging Sciences Peshawar Campus

Student Name:_____
Program: BS (SE)
Semester: Fall-2021
Time Allowed: **01 hour**
Course: Probability & Statistics (MT2005)

Roll No: _____
Examination: **SESSIONAL-II**
Total Marks: 35, Weightage: **15**
Date: 24 / 11 / 2021
Instructor: Osama Sohrab

NOTE: ATTEMPT ALL PROBLEMS.

Problem # 01 **Marks =10**

Suppose that 2 % of the people in Peshawar have the Covid 19. A laboratory conducting test to identify Covid 19 is 99 percent effective in detecting this disease when it is, in fact, present. Also, if a person does not have covid 19, the test correctly indicates so 99.9 % of the time. A random person from Peshawar is tested and his test result is positive then what is the probability that he has actually covid 19?

Problem # 02 **Marks =15**

(Diagnostics of computer codes): A new computer program consists of two modules. The first module contains an error with probability 0.2. The second module is more complex; it has a probability of 0.4 to contain an error, independently of the first module. An error in the first module alone causes the program to crash with probability 0.5. For the second module, this probability is 0.8. If there are errors in both modules, the program crashes with probability 0.9. Suppose the program crashed. What is the probability of errors in both modules?

Problem # 03 **Marks =10**

The Commulative Distribution Function (CDF) of a randam variable X is given by

$$F(x) = \begin{cases} 0 & x < 0 \\ \frac{x}{2} & 0 \le x < 1 \\ \frac{2}{3} & 1 \le x < 2 \\ \frac{11}{12} & 2 \le x < 3 \\ 1 & 3 \le x \end{cases}$$

Compute **(a)** $P\{X > \frac{1}{2}\}$ **(b)** $P\{2 < X \le 4\}$ **(c)** Plot the CDF.

THE END