VIT

Vellore Institute of Technology

Fall Semester 2019-20
Continuous Assessment Test – II
B.Tech. Programmes
MAT2001-Statistics for Engineers
Slot: **D1+TD1**

Exam Duration: 90 minutes **(Use of Statistical Table is permitted)** Maximum Marks: 50

Answer All the Questions (5 × 10 = 50 marks)

1. Marks obtained by 12 students in the college test (x) and the university test (y) are as follows:

x	41	45	50	68	47	77	90	100	80	100	40	43
y	60	63	60	48	85	56	53	91	74	98	65	43

What is your estimate of the marks a student could have obtained in the university test if he obtained 60 in the college test but was ill at the time of the university test? [CO 3]

2. Suppose that an airplane engine will fail, when in flight, with probability $1 - p$ independently from engine to engine; suppose that the airplane will make a successful flight if at least 50 percent of its engines remain operative. For what values of p is a four-engine plane is preferable to a two-engine plane? [CO 2]

3. The marks obtained by a number of students in a certain subject are assumed to be approximately normally distributed with mean 55 and a SD of 5. If 5 students are taken at random from this set, what is the probability that 3 of them would have scored marks above 60? [CO 2]

4. A manufacturer of light bulbs claims that on the average 2% of the bulbs manufactured by his firm are defective. A random sample of 400 bulbs contained 13 defective bulbs. On the basis of this sample, can you support the manufacture's claim at 5% LOS? [CO 4]

5. A sample of 100 bulbs of brand A gave a mean lifetime of 1200 h, with an SD of 70 h, while another sample of 120 bulbs of brand B gave a mean lifetime of 1150 h, with a SD of 85 h. Can we conclude that brand A bulbs are superior to brand B bulbs at 1% LOS? [CO 4]