VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Vellore – 632014, Tamil Nadu, India.

SCHOOL OF ADVANCED SCIENCES
DEPARTMENT OF MATHEMATICS
FALL SEMESTER – 2024∼2025
PMAT501L – Probability and Statistics
E2+TE2 Slot

DIGITAL ASSIGNMENT – II

Instructions:

(*i*). Last Date for Submission of Digital Assignment – II (DA–II) : **25th October 2024.**

(*ii*). Mention the Register Number, Name, Slot Details, Course Code and Course Title in the First Page of the Assignment. Also mention the Register Number and Name in every page of the document and write the problem statement for each question.

(*iii*). Submit the soft copy of answers for all the following questions as a single PDF document into V-Top Login properly on or before the mentioned last date.

Answer ALL the Questions

1. Find the equation of the multiple regression plane of Z on X and Y from the following data.

X :	30	40	20	50	60	40	20	60
Y :	11	10	7	15	19	12	8	14
Z :	110	80	70	120	150	90	70	120

2. It is known that probability of an item produced by a certain machine will be defective is 0.10. If the produced items are sent to the market in packets of 50, then find the number of packets containing at least, exactly and at most 5 defective items in a consignment of 1000 packets by using (*i*). Binomial Distribution and (*ii*). Poisson Approximation to the Binomial Distribution.

3. The finish times for marathon runners during a race are normally distributed with a mean of 200 minutes and a standard deviation of 50 minutes.

   (*i*). What is the probability that a runner will complete the marathon within 3 hours ?

   (*ii*). What proportion of the runners will complete the marathon between 3 hours and 4 hours ?

   (*iii*). What is the probability that a runner will complete the marathon after 4 hours ?

   (*iv*). Calculate to the nearest minute, the time by which the first 8% runners have completed the marathon.

4. The student welfare office of a certain university polled a random sample of 1000 male students and found that 720 were in favor of a new grading system. At the same time, 695 out of a random sample of 900 female students were in favor of the new system. Do the results indicate a significant difference in the proportion of male and female students who favor the new grading system at 95% level of confidence?

5. Write the Detailed Report on Applications of Correlation & Regression Analysis or Probability Distributions or Sampling Techniques in Science, Engineering, or Technology Oriented Problems for minimum 1 page.

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