

## **United International University**

## School of Science and Engineering

Mid Term Exam Trimester: Fall-2021 Course Title: Probability and Statistics

Course Code: Math 2205/Stat 205 Marks: 30 Time: 1 Hour 45 Minutes

## [Note that the number of marks is given in brackets [] at the end of each question or part question.] [You have to answer all the questions.]

- Q1. a) A fair dice rolled twice. The event R is such that the sum of the two outcomes is 7. The event [4] S is such that the product of the two outcomes is 12.
  - (i) Find the probability of R
  - (ii) Find the probability of S
  - (iii) Are events R and S independent? Justify your answer.
  - b) At the beginning of a certain study of a group of persons, 16% were classified as heavy smokers, 36% as light smokers, and 48% as nonsmokers. In the five-year study, it was determined that the death rates of the heavy smokers, light smokers and non-smoker were 50%, 30% and 10% respectively. A randomly selected participant died over the five-year period; calculate the probability that the participant was a nonsmoker.
- Q2. a) Consider the following frequency distribution of daily expenditure of 100 UIU students.

0-100	100-200	200-300	300-400	400-500	
9	19	34	27	11	
	0-100	0-100 100-200 9 19	0-100 100-200 200-300 9 19 34	0-100 100-200 200-300 300-400 9 19 34 27	

- (i). Sketch the Histogram [3]
- (ii). Find the mean and Median. [4]
- (iii). Estimate the Standard deviation. [3]
- b) For a distribution the following measures are summarized, state and sketch the nature of the [2] distribution.

Mean = 30.8, Median = 31.35, and Mode = 32.7

Q3. a) Discuss the strength of correlation from the following Pearson' correlation coefficient. [1]

(i) r = 0.15 (ii) r = -1

b) The years of experience (x) and the annual turnover (\$y) are presented in the following table.

Years of experience	r	3	4	4	6	9	10
Sales Volume in thousand \$	v	80	94	102	105	115	123
Sales volume in thousand \$	y	00	71	102			

- (i). Using the above set of data calculate the value of r (coefficient of correlation) [3] and interpret the result
- (ii). Find the regression line in the form y = a + bx.
- (iii). Verify your model found in question (ii) with the tabular value for 6 years' [2] experience.
- (iv). Predict the annual sales turnover for a person with 12 years' experience.