

Course Code: MT206	Course Name: Probability & Statistics
Instructor Name / Names: Osama Bin Ajaz, Nadeem Khan, and Javeria Iftikhar	
Student Roll No:	Section No:

Instructions:

- Return the question paper.
- Read each question completely before answering it. There are 3 **questions and 2 pages**
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- All the answers must be solved according to the sequence given in the question paper.
- Show detail steps in the solution to each question.
- This paper is subjective

Time: 1 hr.

Max Marks: 40

Question # 01:

[Max. Marks = 10]

Select the correct answer for each from the given options. Cutting or marking two or more options will not be considered.

- Appropriate level of measurement for rating of movies as G, PG, and R is:  
(a) Ordinal (b) **Nominal** (c) Interval (d) Ratio
- When data are categorized as rural, suburban and urban for places of residence, the most appropriate measure of central tendency is the \_\_\_\_\_  
(a) Mean (b) Median (c) **Mode** (d) Geometric mean
- the complementary event for selecting 8 correct True/False questions is:  
(a) Guessing 8 incorrect answers (b) **Guessing at least one incorrect answer**  
(c) Guessing at least one correct answer (d) Guessing no incorrect answers
- A red die is tossed 4 times. What is the probability of obtaining at least one 5?  
(a) 0.511 (b) 0.510 (c) **0.518** (d) 0.5128
- If each value of a series is multiplied by a constant "c", the coefficient of variation as compared to original value is: (a) Increased (b) decreased (c) **unaltered** (d) zero
- If an event B has occurred and it is known that  $P(B) = 1$ , the conditional probability  $P(A|B)$  is equal to:  
(a) **P(A)** (b)  $P(B)$  (c) one (d) zero
- The probability of two persons being born on the same day (ignoring date) is:  
(a) 1/49 (b) 1/365 (c) **1/7** (d) none of these
- If the chance of Ahmed hitting a target is 3 times out of 4 and Bilal 4 times out of 5 and of C 5 times out of 6. The probability that the target will be hit by one person is:  
(a) 19/24 (b) 23/30 (c) **47/120** (d) none of these
- A statistical device used data analysis that is a combination of a frequency distribution and a histogram is called \_\_\_\_\_ (a) Relative frequency histogram (b) **Stem and Leaf plot** (c) OGIVE (d) none of these
- A statistic that tells the number of standard deviations a data value is above or below the mean is called  
(a) A quartile (b) A percentile (c) A coefficient of variation (d) **z-score**

**Question # 02**

**[Max. Marks = 20]**

- (i) One of the goals of the study was to determine when road rage occurs most often. The days on which 69 road rage incidents occurred are presented in the following table

F	F	Tu	Tu	F	Su	F	F	Tu	F
Tu	Sa	Sa	F	Sa	Tu	W	W	Th	Th
Th	Sa	M	Tu	Th	Su	W	Th	W	Tu
Tu	F	Th	Th	F	W	F	Th	F	Sa
F	W	W	F	Tu	W	W	Th	M	M
F	Su	Tu	F	W	Su	W	Th	M	Tu
F	W	Th	M	Su	Sa	Sa	F	F	

- a) Obtain a relative frequency distribution. (3)
- b) Construct a bar chart. (3)
- (ii) Consider the following raw data: 60, 58, 52, 58, 59, 58, 51, 61, 54, 59, 55, 53, 44, 46, 47, 42, 56, 57, 49, 41, and 43.
- a) Construct a Stem-and-leaf plot. (2)
- b) By using stem-and-leaf plot, construct a group frequency distribution with class width 10 and then construct boxplot. (11)
- omments on the shape of the distribution. (1)

**Question # 03**

**[Max. Marks = 10]**

- (i) How many three-digit numbers can be formed from the digits 0, 1, 2, 3, 4, and 5 if each digit can be used only once? (5)
- (a) How many of these are even numbers? (b) How many are greater than 220? (3)
- (ii) In a cafeteria students may order any combination of Chips, Sandwiches, and Cold drink. The probability that a student chooses a cold drink is 0.45, sandwiches and chips 0.19, cold drink and sandwiches 0.15, cold drink and chips 0.25, cold drink or sandwiches 0.6, cold drink or chips 0.84, cold drink or chips or sandwiches 0.9. Find the probability that a student chooses all three. (3)
- (iii) The following table shows 1000 nursing school applicants classified according to scores made on a college entrance examination and the quality of the high school from which they graduated, as rated by a group of educators. Calculate the probability that an applicant picked at random from this group: (2)

(a) Made a low score on the examination given that he or she graduated from a superior high school.

(b)  $P(A|H)$ .

Score	Quality of High Schools		
	Poor ( <i>P</i> )	Average ( <i>A</i> )	Superior ( <i>S</i> )
Low ( <i>L</i> )	105	60	55
Medium ( <i>M</i> )	70	175	145
High ( <i>H</i> )	25	65	300