COMSATS University Islamabad
Wah Campus

S. No	

Course Code: MTH 262 | **Time: 90 Min**
Course: Statistics & Probability | **Class: CVE-5AB** | **Marks: 50**
Mid Term Exam Fall 2022 | **Date: 17-11-2022** | **Dr. Shabbir Ahmad**

Name: | **Reg #:**

Q1 [C2, CLO1, PLO2], Q2[C3, CLO2, PLO3], Q3[C3, CLO2, PLO3], Q4[C3, CLO2, PLO3], Q5[C2, CLO1, PLO2]

Q. 1 A data was collected to **express** a regression equation relating length of an infant Y(cm) to weight at birth X_2(kg). **Predict** length of infants with weight 3.15 kg. **(15)**

Y	57	52	61	67	53	62
X	2.7	2.1	4.4	5.5	3.2	4.3

Q. 2 For a frequency distribution: $\sum f(x-\bar{x})^2 = 92.3, \sum fx^2 = 1025, \sum f = 30$. **Calculate** $\sum fx$. **(5)**

Q. 3. Calculate r_{12}, r_{13} *and* r_{23} from the following regression coefficients: **(10)**

$b_{12} = -0.10, b_{21} = -0.40, b_{13} = 0.27, b_{31} = 0.60, b_{23} = 0.67$ and $b_{32} = 0.38$.

Q. 4 **Calculate** *Bowley's Coefficient of Skewness* from the following frequency distribution. **(15)**

Class Limits	65-84	85-104	105-124	125-144	145-164	165-184
Frequency	9	10	17	11	5	8

Q. 5. The 2nd, 3rd & 4th pure moments are 25.78, 20.67 & 1189.78 respectively. **Discuss** about Kurtosis. **(5)**

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S. No	

Course Code: MTH 262 **Time: 3 hr**
Course: Statistics & Probability **Class: CVE-5AB** **Marks: 100**
Terminal Exam Fall 2022 **Date: January 19, 2023,** **Instructor: Dr. Shabbir Ahmad**

Name: **Reg #:**

Q.1 [C2, CLO1, PLO2], Q.2 [C3, CLO1, PLO2], Q.3 [C3, CLO1, PLO2], Q.4 [C3, CLO2, PLO3], Q.5 [C2, CLO2, PLO3], Q.6 [C2, CLO2, PLO3], Q.7 [C3, CLO3, PLO5], Q.8 [C3, CLO3, PLO5], Q.9 [C3, CLO3, PLO5]

Q. 1 **Predict** the production for 1999−2003 (with all trend values), by using method of least squares. **(20)**

Years	1991	1992	1993	1994	1995	1996	1997	1998
Production (000) tones	215	197	216	213	322	405	415	532

Q. 2 A manufacturer purchases a certain part from suppliers *A*, *B*, and *C*. Supplier *A* supplies 60% of the parts, *B* 30%, and *C* 10%. The quality of parts varies among the suppliers, with *A*, *B*, and *C* parts having 3%, 1%, and 2% defective rates, respectively. A part is found to be good, **Calculate** the probability it was supplied by *B*? **(10)**

Q. 3 Almost 10% of the students come in university without university identity card. The security guard monitors every student at gate, **Calculate** the probability that ***(i)*** the 20^{th} student is 7^{th} who will not allowed to enter in university; ***(ii)*** the 19^{th} student will be the 1^{st} who will be allowed to enter in university. **(5+5)**

Q. 4 A magician has 5 red, 6 blue & 4 yellow beads in his left pocket while 7 red, 5 blue & 3 yellow beads in his right pocket. He moves a bead from left to right pocket, a bead from right pocket to left and selects a bead from left pocket. **Calculate** the probability that beads selected are ***(i)*** red, yellow, blue; ***(ii)*** blue, yellow, red. **(5+5)**

Q. 5 Entry to a certain University is determined by a national test. The scores on this test are normally distributed with a mean of 500 and a standard deviation of 100. Tom wants to be admitted to this university and he knows that he must score better than at least 70% of the students who took the test. Tom takes the test and scores 585. **Determine** whether he be admitted to this university? **(10)**

Q. 6 Determine Paasche's index numbers for 2020 & 2021 using 2022 as base from this information. **(10)**

Items	2020		2021		2022	
	P_0	Q_0	P_1	Q_1	P_2	Q_2
Potatoes	21	6	22	7	10	9
Carrots	35	3	35	6	22	6
Cabbage	45	5	46	4	40	3

Q. 7 A foreign students club listed its members as: 6 Canadians, 3 Japanese, 5 Italians, and 2 Germans. If a committee of 4 members is selected at random. **Calculate** the probability that *(i)* all nationalities are presented; *(ii)* Germans are not selected in committee. **(5+5)**

Q. 8 A machine has 12 components that function independently with the probability of fail is 0.2. A machine stops if more than four components fail. **Calculate** the probability that the machine will be working. **(10)**

Q. 9 Eight customers arrive every hour at a mart. **Calculate** the probability that *(i)* 5 customers will arrive from 5.45pm to 6.00pm; *(ii)* at most 2 customers will arrive from 6.00am to 6.30am. **(5+5)**