Allowed Tables and Charts : None

Answer all the following questions: [70 Marks]

Question 1 [35 marks]

(A) Three horses A, B and C are in race, A is twice as likely to win B and B is twice as likely to win C:

 i) What are their respective probabilities of winning?

 ii) What is the probability that B or C wins? *(6 marks)*

(B) If X is a continuous random variable has probability density function,

$$f(x) = \begin{cases} kx^2 & 0 < x < 3 \\ 0 & elsewhere \end{cases}$$

Find *i)* The constant k.

 ii) The value of $p(1 < X < 2)$. *(6 marks)*

(C) If A, B are two event in sample space "S" and number of outcomes of A equal 15, number of outcomes of B equal 40, $P(A^c \cap B) = 0.2$, and $P(A^c \cap B^c) = 0.6$. Find: **(i)** The number of outcomes of S.

 (ii) The probability of the events A and B. **(10** *marks)*

(D) **Define the following:**

(i) Union, intersection, difference for two events and the complement.

(ii) Define the correlation and its types with example of each type. *(6 marks)*

(E) Prove that   **i)** $P(A') = 1 - P(A)$ **ii)** $P(\emptyset) = 0$

iii) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. *(7 marks)*

Question 2 [35 marks]

(A) Find the value of the Pearson correlation coefficient from the following table:

X	42	39	47	32	45	36	40	35	48	37
Y	45	38	49	34	43	42	39	37	46	41

 (7 marks)

(B) Given the following frequency table

Classes	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65
Frequency	2	3	6	5	4

Calculate   *(i)* The Arithmetic Mean   *(ii)* The Median.   *(iii)* The Mode.

(8 marks)

(C) Given the following frequency table

Classes	20-30	30-40	40-50	50-60
Frequency	50	35	90	55

Calculate   *(i)*   The Harmonic Mean.   *(7 marks)*

(D) For the following data, 12, 17, 13, 15, 16, 8, 9, 10 Calculate:
(i) The arithmetic mean   *(ii)* Geometric mean   *(iii)* Harmonic mean
(iv) The Median   *(v)* The Mean Deviation.   *(8 marks)*

(E) Calculate the Mean deviation for the following data:

Classes	10−20	20−30	30−40	40−50	50−60	total
Freq.	10	20	30	25	15	100

(5 marks)

This exam measures the following ILOs										
Question	Q1-a	Q2-a	Q1-b	Q2-b	Q2-c	Q2-e	Q1-c		Q1-d	Q1-e	Q2-e
					Q2-d	Q1-d					
Skills	Knowledge &understanding skills				Intellectual Skills				Professional Skills		

With our best wishes   *Prof. Arafa Nasef*   *and*   *Dr. Fathi Abdelzeem*