RAMAKRISHNA MISSION VIDYAMANDIRA
(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR [2017-20]
B.A./B.Sc. FIRST SEMESTER (July – December) 2017
Mid-Semester Examination, September 2017

Date : 14/09/2017 **STATISTICS (General)**
Time : 12 noon – 1 pm Paper : I Full Marks : 25

[Use a separate Answer Book for each group]

Group – A
(*Answer **any three** questions*) [3×5]

1. Define histogram and describe how it is constructed. What are its uses?

2. Prove that for a set of positive values $a.m \geq g.m \geq h.m$.

3. Prove that $\frac{1}{n}\sum_{i=1}^{n}(x_i - c)^2$ is minimum when $C = \bar{x}$; where $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$ and $|\bar{x} - Me| \leq s.d$ where Me and s.d are respectively median and standard deviation.

4. Write a short note on **any one** of the following :
   a) Relative Measures of dispersion.
   b) Comparison between Mean, Median and Mode.
   c) Frequency data and Non Frequency data.

Group – B
(*Answer **any two** questions*) [2×5]

5. For three events A, B & C, we know that— A & C are independent; B & C are independent; A & B are disjoint.
   Given $P(A \cup C) = \frac{2}{3}$; $P(B \cup C) = \frac{3}{4}$; $P(A \cup B \cup C) = \frac{11}{12}$, find P(A) , P(B) and P(C)

6. A box contains 3 coins: two regular coins & one fake two headed (i.e both sides are 'head') coin. You pick a coin at random & toss it. What's the probability that it lands heads up?

7. Show that if two events (each with probability > 0) are independent, they cannot be mutually exclusive and if they are mutually exclusive, they cannot be independent.

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