Victoria University of Bangladesh

Final Assessment

Summer Semester – 2022

BBA program

Course title : Business statistics

Course code : STA - 220

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Answers to the question No 1.

a) **sampling Distribution** : In general the probability distribution of a sample statistic is called sampling distribution.

The probability distribution of $\bar{x}$ is called its sampling distribution. It lists the various values that $\bar{x}$ can assume and the probability of each value of $\bar{x}$.

b) **population Distribution** : The population distribution is the probability distribution derived from the information on all elements of a population. The population distribution is the probability distribution of the population data.

c) Sampling error : Sampling error is the difference between the value of a sample statistic and the value of the corresponding population parameter. The difference between the value of a sample statistic obtained from a sample and the value of the corresponding population parameter obtained from the population is called the sampling error.

d) Nonsampling Errors : The errors that occurs in the collection, recording, and tabulation of data are called nonsampling errors. These errors because of human mistakes, and not chance. Note that there is only one kind of sampling error - the error that occurs due to chance.

Answer to the question No : 2

Binomial probability distribution : The binomial probability distribution is one of the most widely used discrete probability distribution. It is applied to find the probability that an outcome will occure x times in n performances of an experiment.

The condition of Binominal Experiment.

An Experiment that satisfied the following four conditions is called a binomial experiment

The condution of Binomial Experiment are given below :

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A binomial experiment must satisfy the ~~follo~~ following four conditions.

1. There are n identical trials.
2. Each trials has only two possible outcomes
3. The probabilities of the two outcomes remain constant
4. The trials are independent.

Answer to the question No: 4

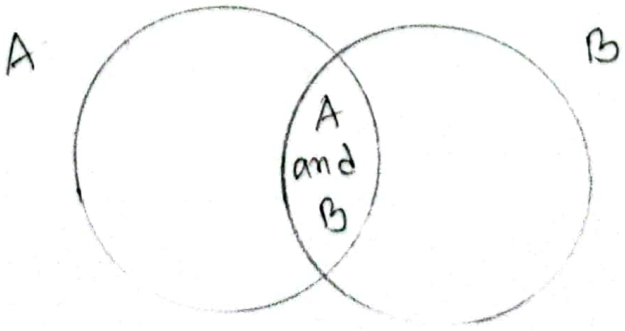
Intersection of events: The intersection of two events is given by the outcomes that are common to both event.

Let A and B be two events defined in a sample space. the intersection of A and B represents the collection of all outcomes that are common to both A and B is denoted by A and B.

The intersection of events A and B is also denoted by either $A \cap B$ or AB.

A = event that a family owns a DVD player

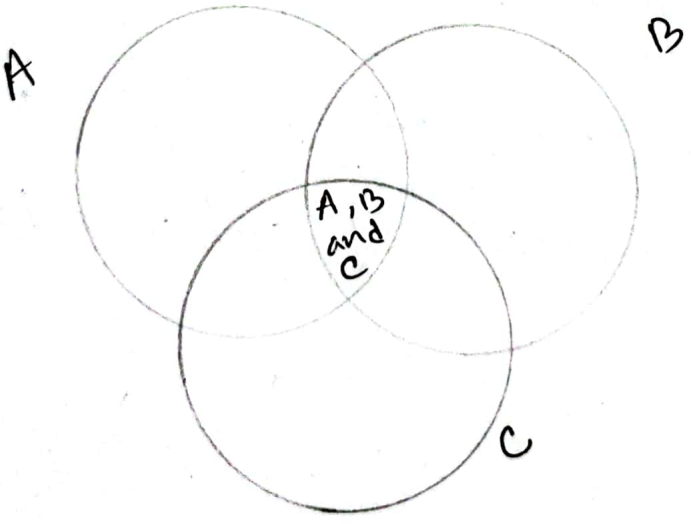
B = event that a family owns a camera.



intersaction of A and B

the intersection of events A and B, denoted by , consists of all outcomes that are in both A and B. complement of an event. the complement of event A, denoted by, consists of All outcomes that are not in A.

Associative of law : $(E \cup E) \cup G = E \cup (F \cup G)$



intersection of A, B, and C.

P.t.O

joint probability : The probability of the intersection of two events is called their joint probability. It is written as

$$P(A \text{ and } B)$$

The probability of the intersection of two events is obtained by multiplying the marginal probability of one event by the condutional probability of the second event. this rule is called multiplicate rules.

Multiplication Rule to find joint probability: the probability of the intersection of two events A and B is

$$P(A \text{ and } B) = P(A)\, P(B/A)$$

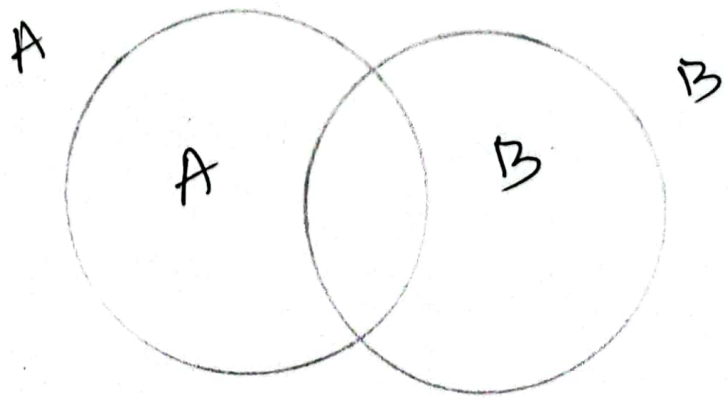
Answere to the question No:3 :

Union of Events : The union of two events A and B includes all outcomes that are either in A or in B or in Both A and B.

Let A and B be two events defined in a sample space. the union of events A and B is the collection of all outcomes that belong either to A or to B or to both A and B and is denoted by

A or B .

the union of events also A and B is also denoted by A∪B .



Example : A senior citizen center has 300 members. of them 140 are male, 210 take at least one medicine on a permanent basis, Describe and 95 are male and take at least on medicine on a permanent basis. Describe the union of events "male" and take at least one medicine on a permanent basis.

Solution: Let us define the following events:

M = a Senior citizen is a male.
F = a Senior citizen is a female.
A = a Senior citizen takes at least one medicine
B = a Senior citizen does not take any medicine

The union of events "male" and take at least one medicine" includes those senior citizens who are either male or take at least one medicine or both. the number of such senior citizen is. $140+210-95 = 255$

To avoid double counting we subtracted 95 from the sum of the other two numbers the sum of the numbers is three shaded cells gives the number of senior citizens who are either male or take at least medicine or both. However if we add totals of the row labled M and the column labled A, we count twice.

	A	B	Total
M	95	45	140
F	115	45	160
Total	210	90	300

counted twice