[25]

SARDAR PATEL UNIVERSITY

B.Sc Semester – III Examination (CBCS) (NC) (Old Course)
Tuesday, 5th January, 2021

Time : 10 to 12

Statistics

M.Marks : 70

US03FSTA01 (Foundation of Statistics - I)

Q.1 Multiple choice questions   (1 × 10)

1 In a village of 1000 population, 40% constitute Hindu, 30% Muslim, 10% Sikhs and 20% Christians. We want to take a sample of 10% of the population to study the eating habits of this population. The best method would be
   (a) Simple Random Sampling   (b) Systematic Sampling
   (c) Stratified Random Sampling   (d) All of these

2 The standard deviation of
   15, 22, 27, 11, 9, 21, 14, 9 is
   (a) 6.22   (b) 6.12   (c) 6.04   (d) 6.32

3 The suitable formula for computing the number of classes in construction of grouped frequency distribution
   (a) 3.322 log N   (b) 1+ 0.322 log N   (c) 1 – 3.322 log N   (d) 1+3.322 log N

4 The first step in tabulation is
   (a) Foot note   (b) Source note   (c) Captions   (d) Classification

5 Which of the following can be determined graphically with the help of histogram?
   (a) Mean   (b) Median   (c) Mode   (d) Range

6 Pain level (None, Mild, Moderate, Severe) is?
   (a) Nominal   (b) Ordinal   (c) Discrete   (d) Continuous

7 Which diagram do you considered to be most suitable to present the data given below?
   Temperature of Metropolitan cities ('in degree Celsius)

City	Mumbai	Delhi	Chennai	Bangalore	Calcutta
Max	32	38	36	28	38
Min	27	28	27	21	29

   (a) Simple Bar   (b) Sub divided Bar   (c) Percentage Bar   (d) Multiple Bar

8 Sampling is inevitable(essential) in the situation:
   (a) Blood test of a person   (b) Testing life of electronics item
   (c) To test the quality of a manufactured items   (d) All of the above

9 In _____ first unit is selected at random and remaining units are selected units are selected according to some system/pattern.
   (a) Simple Random Sampling   (b) Stratified Random Sampling
   (c) Systematic Sampling   (d) All of the above

10 Which of the following measure of dispersion needs the value of mean
   (a) range   (b) quartile deviation
   (c) mean deviation   (d) standard deviation

Q.2 Fill in the blanks   (4 × 1)

1 The main aim of sample survey is to get reliable information about the _____ in less time and at a lower cost.

2 The standard deviation of first 5 natural numbers is _____

3 _____ is the process of arranging data into systematic and compact form.

4 Qualitative data can be represented graphically by using _____

True – False   (4 × 1)

5 The headings of the columns of a table are called stubs.

6 The most commonly used device of presenting business and economical data is bar diagram.

7 Median is also called positional average.

8 Stratified random sampling is used when the population is homogeneous.

(P.T.O.)

Q.3   Short Type Questions (Attempt Any Ten) (10×2)
1   What is secondary data? Give any two sources of secondary data.
2   State the limitations of Statistics?
3   State the aim of sample survey.
4   Give two examples each of nominal and ordinal data.
5   Define Mode. Give two examples where mode can be used.
6   What is tabulation? State its importance.
7   List out the various methods of collecting primary data. If the informants/respondents are literate and spread over a vast area, which method do you consider to be best?
8   What is classification? State the rules for classification.
9   Find median of the following data:

| 52 | 37 | 66 | 45 | 12 | 45 | 78 | 51 |

10   List out the various measures of dispersion. Write in brief about any one of them.
11   How will you draw a sample of size 4 from 20 units in the population using Systematic sampling?
12   What is an average? State its uses.

Q.4   Long Answer Questions (Attempt Any Four) (4×8)
(a)   (i) Measurements of the left-hand and right-hand gripping strengths of left- handed writers are recorded.

No.	1	2	3	4	5	6	7
Left-hand	140	90	125	130	95	121	85
Right-hand	138	87	110	132	96	110	76

Present the above data through a most suitable diagram. State its objective(s).

(ii) Among the 144 individuals who had experienced acute myocardial infraction (Heart attack), 46 were diagnosed with diabetes. Among 144 individuals who were free of heart disease only 25 suffered from diabetes (a) Present the above data in the two-way frequency table (b) State its objectives.

(b)   An analysis of the fat content (%) of a random sample of 175 cheese burgers resulted in the following summarized information:

Fat content (%)	26 - 28	28 - 30	30 - 32	32 - 34	34 - 36	36 - 38	38 - 40
No. of cheese burgers	7	22	36	45	33	28	4

Calculate mode and determine graphically also.

(c)   Tabulate the following information:
"In 2010 out of total 2000 patients in Krishna Hospital, 1550 were admitted in special ward. The number of women patients was 250, out of which 200 admitted in general ward."
"In 2015 the total patients in special ward was 1725 out of which 1600 were men. The number of patients in general ward was 380 among which 155 were women."

(d)   (i) List out the various methods of collecting primary data. Write in brief about any one of them.
(ii) State the various measures of central tendency. Define any one of them. Write its merits and demerits.

(e)   (i) Write on the following:
(i) Chief sources of secondary data (ii) Give two examples each of Qualitative and Quantitative data.
(ii) Present the following data through most suitable diagram.

Year	Mobile Internet Users (in millions)		Total
	Rural	Urban	
2012 – 13	04	44	48
2013 – 14	21	70	91
2014 – 15	29	126	155
2015 – 16	68	171	239
2016 - 17	109	262	371

Source: IAMAI, Morgan Stanley Research

(f)   Two groups of six guinea pigs each were injected, respectively with 0.5 mg, 1.0 mg of a new tranquilizer and the following are the number of minutes it took to fall asleep:

Group - I (0.5 mg)	21	23	19	24	25	23
Group - II (1.0 mg)	19	21	20	18	22	20

Which group has greater amount of variability in the measurements? Justify your answer by calculating suitable statistical measure.

(g)   (i) Measurements of the acidity level (pH) of rain samples were recorded at 12 sites in an industrial region.

4.3	4.2	4.5	4.9	4.7	4.8
3.5	5.1	5.0	3.6	4.8	3.6

Calculate median and standard deviation of the acidity level of rain samples.

(ii) Describe in brief about application of Statistics in any two fields.

(h)   Blood cholesterol levels were recorded for 40 persons sampled in a medical study group and the following data were obtained.

233	212	249	227	249	258	265	196	310	244
256	161	195	233	199	282	286	163	205	176
195	299	210	301	357	195	226	297	227	218
355	234	195	179	174	281	154	330	223	284

(i) Construct a frequency distribution of equal class - width taking 210 - 240 as one of the classes (ii) Determine median.

—X—