Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
(Autonomous)
End Semester Examination: Jan.2022
Faculty: Science and Technology

Program: BScGen03 **Semester: I** **SET: A**
Program (Specific): General B.Sc. **Course Type: CC**
Class: F.Y.B.Sc. (General) **Max.Marks: 35**
Name of the Course: Descriptive Statistics
Course Code: 22-ST-111 **Time: 2Hr**
Paper: I

Instructions to the candidate:

1) ***There are 4 sections in the question paper. Write each section on separate page.***
2) ***All Sections are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw a well labelled diagram wherever necessary.***
5) ***Use of statistical tables and scientific calculators are allowed.***

SECTION: A

Q1) Choose the correct alternative in each of the following **[1x5]**

1) Statistics is a ….

   a) Collection of Data b) Presentation of Data

   c) Analysis of Data d) all of the above

2) Primary data means ….

   a) Original data b) Result of survey

   c) Result of investigation d) all the above

3) Which of the following is not a random sampling?

   a) Purposive sampling b) Systematic sampling

   c) SRSWOR d) Stratified sampling

4) Which limit is excluded in case of exclusive method?

   a) Lower limit b) Upper limit

   c) Both upper and lower limit d) Mid-point

5) Given (A) =150, (B)=180, (AB)=100 and N=270, the class frequency ($\alpha\beta$) is …

   a) 80 b) 90

   c) 40 d) 120

Q2) Attempt any four from the following **[1x4]**

1) Define variable.
2) Describe census method.
3) Define class frequency.
4) If variance is 4 and $\mu_3 = 3$ then find β_1.
5) Explain Dichotomy.
6) Define Positive Attribute.

SECTION: B

Q3) Attempt any four from the following **[2x4]**

1) If variance(X) = 5 and Y = 3X+2 the find variance of Y

2) If (A) = (B) = N/2 then show that (Aβ) = (αB)

3) Name any two statistical organization in India

4) Explain stratified sampling method.

5) Show that $\beta_1 \geq 0$ and interpret it.

6) Compute combine mean for following Data

n1 = 50 $\overline{X1}$ = 20

n2 = 30 $\overline{X2}$= 15

SECTION: C

Q4) Attempt any four from the following **[2x4]**

1) Show that $\sum(xi - \overline{X}) = 0$.

2) Compute the variance and S.D for the data given below:

10 , 12 , 14 , 16 , 18 , 20 , 22

3) Find less than cumulative frequencies for following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	12	15	4	4

4) Write the 2nd and 3rd central moment in terms of raw moments.

5) Examine whether the following data are consistent.
(A) =30, (B) = 80, (AB) =40 and N=100

6) State Bowley's coefficient of Skewness and coefficient of Kurtosis based on moments.

SECTION: D

Q5) Attempt any two from the following **[5x 2]**

1) Explain the following terms and hence calculate it for the following data :
5, 7, 10, 8, 6, 5 , 3
   a) Mean deviation about mean
   b) Coefficient of Quartile deviation

2) If (A) = (B) = N/2 and (AB) = N/4, find the coefficient of association Q_{AB} and interpret the results.

3) The first four raw moments of a frequency distribution are $\mu_1' = 2$, $\mu_2' = 20$, $\mu_3' = 40$, $\mu_4' = 200$ then compute
   a) First four central moments.
   b) Coefficient of Skewness and also comment on it.

4) The mode of the daily expenditure of 100 families is 44.375. The expenditure of these families are given below.

Expenditure	20-30	30-40	40-50	50-60	60-70
Number of families	14	-	27	-	15

Find the missing frequencies.

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5) ***Use of statistical tables and scientific calculators are allowed.***

SECTION: A

Q1) Choose the correct alternative in each of the following **[1x5]**

1) Secondary data means ….
   a) Original data
   b) Result of survey
   c) Result of investigation
   d) Second hand data

2) NSSO stands for ….
   a) National Sample Survey Organization
   b) National Simple Survey Office
   c) National Sample Survey Office
   d) National Statistical survey Organization

3) Sampling is …...
   a) Subset of population
   b) Part of population under study
   c) 5% of population
   d) At least 50% of population

4) Which scale uses concept of absolute zero?
   a) Nominal scale
   b) Ordinal scale
   c) Ratio scale
   d) Interval scale

6) Given $(A\beta)=35$, $(AB)=45$, $(\alpha B)=25$ and $N=100$ reveal that the data are …
   a) Consistent
   b) Insufficient

c) Inconsistent d) None of the above

Q2) Attempt any four from the following [1x4]

1) Define Discrete variable.
2) Describe relative frequency.
3) If $\mu_2 = 2$ and $\mu_4 = 3$ then find β_2.
4) Describe Sampling method.
5) Define Attribute.
6) Explain order of a class.

SECTION: B

Q3) Attempt any four from the following [2x4]

1) Write a note on cluster sampling method.

2) Name any two fields where statistics is used?

3) Show that : $-1 \leq Q_{AB} \leq 1$, notations have their usual meanings.

4) If $Y= 2X + 3$ then show that $\sigma^2_y = 9\,\sigma^2_x$.

5) Compute combine mean for following data;
   n1 = 50 $\overline{X1} = 20$
   n2 = 50 $\overline{X2} = 15$

6) Show that $\beta_2 \geq 1$.

SECTION: C

Q4) Attempt any four from the following [2x4]

1) Write a note on Histogram

2) Find variance for following data

Observations	10	20	30	40	50
frequency	5	12	15	4	4

3) Write the 2nd and 4rd central moment in terms of raw moments.

4) Compute the coefficient of association between A and B for the following data and interpret it.

(A) =47, (B) =62, (AB) =32 and N=100

5) Show that $\sum(xi-\overline{X}) = 0$.

6) State Karl Pearson's coefficient of skewness and also interpret it.

SECTION: D

Q5) Attempt any two from the following **[5x 2]**

1) Show that:
   a) $(A)+(B)-N \leq (AB) \leq \min\{(A),(B)\}$
   b) If $(A) = (B) = N/2$ then show that $(A\beta) = (\alpha B)$

2) Explain the following terms and hence calculate it for the given data:

   6 , 8 , 10, 14 , 16 , 20 , 14
   a) Coefficient of variation
   b) Mean deviation about mode

3) The first four raw moments of a frequency distribution are $\mu_1' = 4$, $\mu_2' = 30$, $\mu_3' = 50$, $\mu_4' = 300$ then compute the following
   a) First four central moments
   b) Coefficient of kurtosis and also comment on results.

4) The median of the daily expenditure of 100 families is 46.4. The expenditure of these families are given below.

Expenditure	20-30	30-40	40-50	50-60	60-70
Number of families	14	-	25	-	15

Find the missing frequencies.

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SECTION: A

Q1) Choose the correct alternative for each of the following **[1x5]**

1) Statistics performs functions such as ….

   a) Forecasting and planning b) Presentation of facts and figures

   c) Controlling and exploring d) all of the above

2) Secondary data means ….

   a) Original data b) Result of survey

   c) Result of enquiry d) None of the above

3) Which scale uses concept of absolute zero?

   a) Nominal scale b) Ordinal scale

   c) Ratio scale d) Interval scale

4) Which limit is excluded in case of inclusive method?

   a) Lower limit b) Upper limit

   c) Both a) and b) d) None of the above

5) Given (A) =200 , (B)=180, (AB)=100 and N=300, the class frequency (αβ) is …

   a) 80 b) 90

   c) 40 d) 120

Q2) Attempt any four from the following **[1x4]**

1) Define population.
2) Describe census method.
3) Define Inclusive classification.
4) If variance is 4 and μ_4= 3 then find coefficient of kurtosis.
5) Explain association between qualitative variable.
6) Define Positive Attribute.

SECTION: B

Q3) Attempt any four from the following **[2x4]**

1) Show that $\beta_1 \geq 0$ and interpret it.

2) Compute combine mean for following Data

   n1 = 50 $\quad \overline{X1} = 20$

   n2 = 80 $\quad \overline{X2} = 10$

3) Show that : $-1 \leq Q_{AB} \leq 1$, notations have their usual meanings

4) Name any two statistical organization in India

5) If variance(x) = 5 and Y= 2X+5 the find variance of Y

6) If (A) = (B) = N/2 then show that (AB) = ($\alpha\beta$)

SECTION: C

Q4) Attempt any four from the following **[2x4]**

1) Show that $\sum (xi - \overline{X}) = 0$.

2) State coefficient of Kurtosis and Karl Pearson coefficient of skewness.

3) Compute the variance and S.D for the data given below:

   5 , 20 , 90 , 76 , 102 , 90 , 6

4) Find more than cumulative frequencies for following data

Class	0-10	10-20	20-30	30-40	40-50
frequency	5	12	15	4	4

5) Write the 3rd and 4th central moment in terms of raw moments.

6) Examine whether the following data are consistent
(A) =30, (B) =80, (AB) =40 and N=100

SECTION: D

Q5) Attempt any two from the following **[5x 2]**

1) The first four raw moments of a frequency distribution are $\mu_1' = 7$, $\mu_2' = 40$, $\mu_3' = 90$, $\mu_4' = 500$ then compute the following.
   a) First four central moments
   b) Coefficient of skewness and also comment on results

2) Explain the following terms and hence calculate it for the given data:
   7 , 8 , 10 , 14 , 16 , 20 , 14
   a) Mean deviation about median
   b) variance

3) The median of the daily expenditure of 100 families is 43.5. The expenditure of these families is given below.

Expenditure	20-30	30-40	40-50	50-60	60-70
Number of families	13	-	15	-	27

   Find the missing frequencies.

4) Show that:
   a) $(A)+(B)-N \leq (AB) \leq \min\{(A), (B)\}$
   b) If $(A) = (B) = N/2$ then show that $(A\beta) = (\alpha B)$

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