उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय, प्रयागराज

एकल विषय (सांख्यकी) में प्रमाण–पत्र कार्यक्रम (विज्ञान) अधिन्यास सत्र– 2019–20

Course Code: CSSSTAT-01	*Course Title : Statistical Methods*	*Maximum Marks : 30*

Section -A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Define Harmonic Mean with its merits, demerits and uses.

2. Discuss about the Mean Deviation with its merits and demerits. Also show that Mean Deviation is minimum when it is measured about median of the frequency distribution.

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3. Discuss about the different methods of diagrammatic representation of statistical data.

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. Discuss about the Weighted Mean.

2. What is the difference between multiple bar diagram and divided bar diagram.

3. Discuss about the Pie Chart and Pictogram.

4. Write a note on the Median with its merits, demerits and uses.

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Course Code: CSSSTAT-02	***Course Title: Probability & Distribution***	***Maximum Marks : 30***

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Define Binomial Distribution. Also calculate its moment generation function.

2. Each of n urns contains four white and six black balls, while another urn contains five white and five black balls. An urn is chosen at random from these intel urns and two balls are drawn from it both being black. The probability that five white and three black balls remain in the chosen urn is 1/7. Find the value of n.

3. For three mutually independent events A, B and C, verify if A^C, B^C, C^C are also mutually independent or not?

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. If X ~ B (10, ¼). Then calculate the mean and variance of the distribution.

2. What is mathematical expectation? Also calculate the values of E $(ax_1 + bx_2)$ and V $(ax_1 + bx_2)$ where X_1 and X_2 be the iid random variables.

3. State and Prove Baye's theorem.

4. Give the all Definitions of Probability.

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Course Code: CSSSTAT-03	*Course Title : Correlation, Regression & Statistical Inference*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Discuss about the Regression. Find out the angle between two regression lines.

2. State and Prove Rao Blackwell theorem.

3. Define non parametric tests. Also discuss about the Mann – Whitney U-test.

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. Write short notes on efficiency and sufficiency.

2. Distinguish between correlation coefficient and regression coefficient.

3. Discuss in detail about Sign test and Run test.

4. Write detail notes on Significance test for "equality of means."

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Course Code: CSSSTAT-04	*Course Title: Sampling Theory & Design of Experiment*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Calculate the mean and variance of SRSWOR.

2. Give the complete layout and statistical analysis of RBD. Also give its ANOVA table.

3. For SRSWOR, Prove that, $\bar{y}$ is an unbiased estimates of $\bar{Y}$ and its variance is

$$V(\bar{y}) = \frac{N-n}{N} \frac{S^2}{n}$$

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. Discuss about the basic principle of Design of experiment.

2. Discuss about the different methods for collecting the sample under simple random sampling. (SRS)

3. Write the basic assumptions of RBD. Also discuses its advantages and disadvantages.

4. Discuss about the sources of non response errors.

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Course Code: CSSSTAT-05	*Course Title: Numerical Methods & Basic Computers Knowledge*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Describe (a) Trapezoidal rule (b) Eular- Maculerain Formula

2. What is numerical differentiation? Derive the relationship between differential operator (D) and Shift operator (E).

3. Distinguish between Machine Language and Programming language. Describe high level language.

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. Write short note as : (a) Simpson's one third rule and (b) Waddle's rule

2. Discuss about the Stirling's formula and Bessel's formula.

3. Discuss any one method of estimating missing terms with example.

4. Prove that $y_X = \Sigma_{i=1,2,3...} \frac{(-1)^{i+1}}{ih}(Y_{x+ih} - Y_{x-ih})$

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Course Code: CSSSTAT-06	*Course Title : Applied Statistics*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Define index number. Also give an idea about the deal Index Number.

2. Describe control charts. Also draw the steps control chart of $\bar{x}$ & R.

3. Explain GRR and NRR. Show that NRR ≤ GRR. Why? When GRR will be equal to NRR.

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. Give the different steps for p-chart and d-chart.

2. Discuss about the time series. Also give its different trends.

3. Define Infant mortality rate and maternal mortality rate.

4. Discuss about the Fisher's Index number.

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Course Code: CSSSTAT-07	*Course Title - Operation Research*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Discuss about the Linear Programming Also Define the different steps for Graphical solution to LPP.

2. Write a detailed not on classification of models used in operations research.

3. Solve the following LPP :

   Max $Z = 5x - 2y + 3z$

   subject to $2x + 2y - z \geq 2$

   $3x - 4z \leq 3$

   $y + 3z \leq 3$

   and $x, y, z \geq o$

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words.

1. Discuss in brief about the Hungarian method.

2. Describe the graphical method for $2 \times n$ or $m \times 2$ games.

3. Soles the following LPP graphically (give all steps).

   Max. $Z = 3x + 2y$, subject to $x-y \leq 1$, $x+ y \geq 3$ and $x, y \geq o$.

4. Write a brief note a various types of variables used in LPP.

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Course Code: CSSSTAT-08	*Course Title-Advance Statistical Inference*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. State and prove Crammer - Rao inequality.

2. Distinguish parametric and non parametric test.

3. Prove that the sampling from $N(\mu, \sigma^2)$ population , the sample mean is consistant estimator of μ.

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words

1. Write short notes on (a) Power of test (b) Level of Significance

2. Discuss about the confidence interval and confidence coefficient.

3. Define Consistent estimator.

4. Let X_1 , X_2 ..... , X_n be a random sample of size n from uniform (O, θ). Then obtain sufficient estimator for θ.

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Course Code: CSSSTAT-13	*Course Title - Office Tools and Internet*	*Maximum Marks : 30*

Section - A

Long Answer Questions

Note: Attempt any three questions. Each question should be answered in 800 to 1000 Words.

Maximum Marks: 18

1. Explain how to do the following in an MS Word document:
   a. Setting Header and Footer
   b. Setting Page Numbers
   c. Making contents table

2. Write the steps to do the following in MS Excel:
   a. Sorting table entries alphabetically
   b. Sorting table entries numerically
   c. Calculating sum over entries of a particular column in table

3. Write steps to do the following in MS Power Point:
   a. Inserting sound effect in a slide
   b. Inserting animation
   c. Enable automatic enhancing of slides

Section - B

Short Answer Questions

Maximum Marks: 12

Note: Attempt any four questions. Answer should be given in 200 to 300 Words

1. Write short notes on E-mail.
2. Explain the difference between LAN and WAN.
3. Explain the use of Mail-merge using example.
4. Discuss any two types of communication hardware.