उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

सांख्यिकी (स्नातक) कार्यक्रम अधिन्यास सत्र 2020–2021

Course Code: *PGSTAT-101/MASTAT-101)*	*Course Title:* *Measure and Probability Theory*	*Maximum Marks : 30*

Section- A
Long Answer Questions

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

Maximum Marks: 18

1. State and prove central limit theorem.

2. Define characteristic function of random variable. State some of its important properties.

3. State and prove Fubini's theorem.

Section - B

Short Answer Questions

Maximum Marks: 12

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

1. State and prove Jensen inequality.

2. Discuss about the random variable and its type.

3. Write short notes on (a) Field (b) Signed Measure

4. State and prove Fatou's lemma.

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सांख्यिकी (स्नातक) कार्यक्रम अधिन्यास सत्र 2020−2021

Course Code: *PGSTAT-102/MASTAT-102)*	*Course Title:* *Statistical Inference*	*Maximum Marks : 30*

Section- A
Long Answer Questions

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

Maximum Marks: 18

1. State and prove Rao- Blackwell theorem.

2. On the basis of random sample of size n from the Poisson distribution with parameter θ, obtain UMVUE of $e^{-5\theta}$.

3. On the basis of a random sample of size n from the family of normal distributions $\{N [\theta,\theta], 0<\theta<\infty\}$, obtain a minimal sufficient statistic.

Section - B

Short Answer Questions

Note: Answer all questions. Answer should be given in 200 to 300 Words.

Maximum Marks: 12

1. Write short notes on (a) MP tests (b) UMP tests**.**

2. Let X_1, X_2 - - X_n be a random sample from U $[0, \theta]$, $\theta \in (0,\infty)$. Let $X_{(n)} = $ Max $(X_1,X_2$ - - $X_n)$ Show that $X_{(n)}$ is not BAN for θ.

3. On the basis of a random sample of size n from the Poisson distribution $P(\theta)$, obtain Cramer Rao lower bound for the variance of unbiased estimator of θ^2.
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4. Define the all conditions of a good estimator.

Course Code: *PGSTAT-103/MASTAT-103*	*Course Title:* *Survey Sampling*	*Maximum Marks : 30*

Section- A
Long Answer Questions

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

Maximum Marks: 18

1. Prove that $V(\bar{y}_{sy}) \leq V(\bar{y}_{st}) \leq V(\bar{y}_{srs})$

2. Write a note on Non Sampling and Sampling error.

3. Calculate mean and variance of the SRSWOR.

Section - B

Short Answer Questions

Note: Answer all questions. Answer should be given in 200 to 300 Words.

Maximum Marks: 12

1. Define Parameter and Statistic.

2. Discuss about the advantages and limitations of simple random sampling.

3. Write a note on multistage sampling.

4. Discuss about the Midjuno sampling.

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Course Code: *PGSTAT-105/MASTAT-105*	*Course Title:* *Linear Models and Design of Experiments*	*Maximum Marks : 30*

Section- A
Long Answer Questions

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

Maximum Marks: 18

1. State and prove Gauss-Markov theorem.

2. Discuss about the analysis of covariance and define ANCOVA table.

3. Discuss about the Principles of design of experiment.

Section - B

Short Answer Questions

Note: Answer all questions. Answer should be given in 200 to 300 Words.

Maximum Marks: 12

1. Write a brief note on BLUE

2. Write a note on contrast and orthogonal contrast.

3. Write a note on resolvable design and affine resolvable design.

4. Write a note on Parameters of BIBD. Also prove that $vr = bk$

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Course Code: *PGSTAT-106/MASTAT-106*	*Course Title:* *Nonparametric*	*Maximum Marks : 30*

Section- A
Long Answer Questions

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

Maximum Marks: 18

1. Discuss about the order statistics.

2. Describe two Sample Kolnogorov Smirnov test.

3. Discuss about the Mann-Wliteney U-test.

Section - B

Short Answer Questions

Note: Answer all questions. Answer should be given in 200 to 300 Words.

Maximum Marks: 12

1. Write short notes on two sample location tests.

2. Discuss about the Pitman ARE.

3. Write a note on merits and demerits of non-parametric tests.

4. Write a brief note on location based tests.

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सांख्यकी (स्नातक) कार्यक्रम अधिन्यास सत्र 2020−2021

Course Code: *PGSTAT-107/MASTAT-107*	*Course Title:* *Stochastic Process*	*Maximum Marks : 30*

Section- A
Long Answer Questions

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

Maximum Marks: 18

1. State and prove the Chapman Kolmogorov equation for a Markov Chain. Giving some counter example, show that the equations are satisfied by non-Markovian processes also.

2. Stating the underlying assumptions, give the derivation of a Poisson process.

3. A sequence of experiments as performed, in each of which two function are tossed. Let x_n be equal to thrre numbers of heads in a repeanons of the experiments.

Section - B

Short Answer Questions

Note: Answer all questions. Answer should be given in 200 to 300 Words.

Maximum Marks: 12

1. Define (i) An Ergodic Markov Chain, (ii) Stationary Markov Chain.

2. Find the probability distribution of interarrival time for a Poisson process.

3. Find out the probability generating function of a Simple Branching Process.

4. State in brief random week and gambler's win problem.