MONAD UNIVERSITY, HAPUR (UP)

Programme: M.Sc.

Semester: II

Course: MMTH-121 MATHEMATICAL STATISTICS

Assignment No: 1

Due date of submission: 12.03.2018

Instructions:

1. Write the responses to the assignment in your own handwriting.
2. Submit the responses to your HOD within the due date.
3. Write your Name, Programme, and Enrolment No. clearly at the top of the page.

Q.1

(a) As you are aware of the probability, state and prove Baye's theorem.

(b) Briefly explain Random variables, Distribution functions, Joint probability distribution function and Conditional distribution function.

Q2. (a) As you are aware of moment generating function, define cumulant generating function and cumulants.

(b) Briefly explain discrete distributions: Geometric, Binomial and Poisson.

MONAD UNIVERSITY, HAPUR (UP)

Programme: M.Sc.

Semester: II

Course: MMTH-122 FLUID DYNAMICS

Assignment No: 1

Due date of submission: 12.03.2018

Instructions:

1. Write the responses to the assignment in your own handwriting.
2. Submit the responses to your HOD within the due date.
3. Write your Name, Programme, and Enrolment No. clearly at the top of the page.

Q.1

(a) As you are aware of the fluid dynamics, briefly explain the concept of fluid and its physical properties.

(b) Define translation, rotation and deformation of fluid elements.

Q2. (a) As you are aware of general theory of stress and rate of strain in a real fluid define symmetry of stress tensor, principal axes and principle values of stress tensor.

(b) Briefly explain conservation laws-conservation of mass, conservation of momentum, conservation of energy.

MONAD UNIVERSITY HAPUR (UP)

Programme: **M.Sc.**

Semester: **II**

Course: **MMTH-123 Topology**

Assignment No: **1**

Due date of submission: **12.03.2018**

Instructions

1. Write the responses to the assignment in your own handwriting.
2. Submit the responses to your HOD within the due date.
3. Write your Name, Programme and Enrolment Number clearly at the top of the page.

Q.1

(a) Define topological space. List four distinct non-trivial topologies for the set $\{1,2,3,4\}$.

(b) Let $X = \{a, b, c, d, e\}$ and let T be a topology on X given by $T = \{\emptyset, \{b\}, \{b, c\}, \{b, d, e\}, \{b, c, d, e\}, \{a, b, c\}, X\}$. Find all the T-neighbourhoods of
(i) a and (ii) d.

Q.2

(a) Define continuity in topological space. Let $X = \{1,2,3,4\}$ and $T = \{\emptyset, \{1\}, \{2\}, \{1,2\}, \{2,3,4\}, X\}$. Let $f: X \to X$ be defined by
$f(1) = 2, f(2) = 4, f(3) = 2$ and $f(4) = 3$, then
(i) Show that f is not continuous at 3.
(ii) Show that f is continuous at 4.

(b) Discuss Pasting lemma.

MONAD UNIVERSITY HAPUR (UP)

Programme: **M.Sc.**

Semester: **II**

Course: **MMTH-124 Real analysis**

Assignment No: **1**

Due date of submission: **12.03.2018**

Instruction

4. Write the responses to the assignment in your own handwriting.
5. Submit the responses to your HOD within the due date.
6. Write your Name, Program me, and Enrolment No. clearly at the top of the page.

Q.1

a) If P* is a refinement of P , then

(i) $U(P^*,f,\alpha) \leq U(P,f,\alpha)$

(ii) $L(P,f,\alpha) \leq L(P^*,f,\alpha)$

b) Let f be monotonic on [a,b] and let α be continuous and monotonically increasing on [a,b], then $f \in RS(\alpha)$

Q.2

a)Let $gn(x)=\frac{1}{n}e^{-nx}$ $(0 \leq x \leq inf)$. Show that $<g_n>$ converges uniformly to 0 on [0,inf.[.

b) Give an example each of a bounded set

(i) g.l.b but dose not contain its l.u.b

(ii) l.u.b but dose not contain its g.l.b

MONAD UNIVERSITY, HAPUR (UP)

Programme: M.Sc.

Semester: II

Course: MMTH-125 METRIC SPACE

Assignment No: 1

Due date of submission: 12.03.18

Instructions:

1. Write the responses to the assignment in your own handwriting.
2. Submit the responses to your HOD within the due date.
3. Write your Name, Programme, and Enrolment No. clearly at the top of the page.

Q.1

a) As we know very well in mathematics, a metric or distance function is a function that defines a distance between each pair of elements of a set. A set with a metric is called a metric space. A metric d on a set X is a function $d: X \times X \to R$ such that for all $x, y \in X$ .Discuss properties to say that a metric space (X, d) is a set X with a metric d defined on X

b) In mathematics we know the intersection $A \cap B$ of two sets A and B is the set that contains all elements of A that also belong to B (or equivalently, all elements of B that also belong to A), but no other elements. Is this possible for open set? If your answer is yes then investigate that the intersection of open set is open or not.

Q.2

a) We know that a sequence converges to a limit means, roughly, that the terms of the sequence get closer and closer to the limit. One consequence of this is that the terms will get closer and closer to each other. Maybe this statement — that the terms get closer together — is enough to guarantee that the sequence converges to a limit. This is the idea behind a Cauchy sequence. Give the proof.

b) In mathematics we are aware especially in set theory, a set A is a subset of a set B, or equivalently B is a superset of A, if A is "contained" inside B, i.e. $A \subset B$ that is, all elements of A are also elements of B. The relationship of one set being a subset of another is called inclusion or sometimes containment. Let A, B be the subset of R, then investigate the authenticity of $A \subset B \Rightarrow \overline{A} \subset \overline{B}$.