



DIRECTORATE OF DISTANCE EDUCATION

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Assignment for M.Sc. Mathematics (Final)

अंकभार: 30%

सभी प्रश्नों के उत्तर दें।

प्रत्येक प्रश्नों के उत्तर 800 शब्दों में दें।

Paper IX

1. Explain Reize-Markov representation Theorem.
2. State and Prove Radon-Nikodym Theorem.
3. Define signed measure and also positive and negative sets with examples.
If E is measurable and $0 < V(E) < \infty$, then E contains a positive set A with $V(A) > 0$.

Paper X

1. What is stereographic projection of complex numbers ? Discuss.
2. State and prove Taylor's theorem.
3. Prove that if $f(z)$ is analytic and $f(z) \neq 0$ in a region R of the z -plane ; then the mapping $w=f(z)$ is conformal at all points of R .

Paper XI

1. Find the equation of orthogonal trajectories of the family of curves $r = a(\sec\theta + \tan\theta)$, where a is a parameter.
2. Solve;
 - a) $2yz dx + zx dy - xy(1+z)dz = 0$.
 - b) $(y+3z)dx + (x+2z)dy + (3x+2y)dz = 0$.
3. Solve;
 - a) $(x^4 - 2xy^2 + y^4)dx - (2x^2y - 4xy^3 + \sin y)dy = 0$
 - b) $p^2 - 2p \sin hx - 1 = 0$.

Paper XII

1. Describe the Paradoxes in Set Theory.
2. Let m and n be distinct natural numbers. Then prove that either $m \in n$ or $n \in m$.
Here " ϵ " is a strict linear ordering of N .
3. Let α, β and γ be three (non-zero) ordinal numbers. Then prove that:
 - (a) $\alpha + (\beta + \gamma) = (\alpha + \beta) + \gamma$
 - (b) $\alpha + \beta = \alpha + \gamma = \beta = \gamma$

Paper XIII

1. Briefly explain the feature of hard disk with a diagram.
2. What is data type ? Describe the fundamental data types in C language.
3. Clearly differentiate between function prototype, function definition and function call in C.

Paper XIV

1. How can you create a virtual copy constructor ?
2. What is the difference between function and operator overloading, describe with the help of examples.
3. Why we should write reusable source code and how C++ is helpful to write reusable codes?

Paper XV

1. State and prove the properties of Boolean Algebra.
2. (a) Define a partially ordered set with an example.
(b) Show that every interval of a lattice is a sub lattice.
3. (a) Solve the following equations by matrix method:

$$x+y+z=3$$

$$2x-y+z=2,$$

$$x-2y+3z=2$$

- (b) Find the eigen values and eigen vectors of the matrix

$$\begin{matrix} 1 & -1 & 2 \\ 0 & 1 & 0 \\ 1 & 2 & 1 \end{matrix}$$

***Assignment (दत्तकार्य) जमा करने की अंतिम तिथि 30.06.2022 ***