ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)

Pre Ph. D. Course work Examination 2019-20

MATHEMATICS

PAPER II: CW – 02 (TOOLS AND TECHNIQUES)

Model question paper

[Set – II]

Duration - 3.00 Hrs **Max. Marks - 80**

Note: Section - A is Compulsory. Answer one question from each unit of Section - 'B' carrying equal marks

---

Section - A

1. Answer the following questions in brief. **2 X 10 = 20**

(i) What is Latex?
(ii) Write Latex structure for Binomial coefficient.
(iii) If A = $\frac{1}{x}+\frac{4}{y}+\frac{1}{z}$, find extended compliment of A.
(iv) Prove that the standard fuzzy complement is not cut worthy property.
(v) Define Lipschitz continuous function?
(vi) Write an example of Lipschitz continuous function which is not differentiable?
(vii) What is regularity of a Summation method?
(viii) What is linear Transformation T of the sequence?
(ix) What is order of approximation?
(x) When a function is said to satisfy Lipschitz condition of order**?**

Section - B **12 X 5 = 60**

UNIT – I

2. Discuss about Latex workflow?

3. Discuss the difference between Latex and MikTex.

UNIT – II

4. Prove first decomposition theorem for A where X = $\{x_1,x_2,x_3,x_4,x_5\}$ and
A = $.2/x_1+.4/x_2+.6/x_3+.8/x_4+1/x_5$

5. Let A and B be fuzzy sets defined on the universal set X = Z, where membership functions are given by
A(x) = 5/(-1)+1/0+.5/1+.3/2 And B(x) = .5/2+1/3+.5/4+.3/5.
Let a function f : XxX →X be defined for all $x_1,x_2 \in$ X by $f(x_1, x_2) = x_1+x_2$ calculate f(A,B).

UNIT – III

6. State and prove Brower's fixed point theorem.

7. Let X be a uniformly convex Banach space and C ⊂ X be non – void closed bounded And convex. If f : C→ C is a no – expansive then f has a fixed point in C.

UNIT – IV

8. Show that Eular method is regular.

9. Write short notes on following
(i) (E,1) Sum (ii) (N,P_n) Sum (iii) (H, K)Sum (iv) (C,K) Sum

UNIT – V

10. State and prove Fejer's theorem.

11. Derive Dirichlet's Integral and obtain necessary and sufficient condition that the series $a_0/2 +(\sum_{n=1}^{\infty} h a_n \cos nx + b_n \sin nx)$ converges to a sum s.

===***===