DIRECTORATE OF DISTANCE EDUCATION

L.N. Mithila University, Kameshwaranagar, Darbhanga-846008 (BIHAR)

Phone & Fax : 06272–246506, Website : ddelnmu.ac.in, E-mail : director@ddelnmu.ac.in

M.Sc. Math (Previous) DEC 2022

सत्रीय कार्य (ASSIGNMENT)

Each Maximium in 800 words
Max. Marks/weightage = 30%

All Questions are to be answered (सभी प्रश्नों के उत्तर आवश्यक है।)
All Questions are of equal value (सभी प्रश्नों के मान बराबर है।)

Paper - I (Paper Code - MAT101)

1. What is class Equetion of a finite group? If $o(G) = p^2$, where p is a prime number, then show that a G is abelian.
2. Prove the structure theorem for finite abelian group.
3. Show that if W_1 and W_2 are two sub-spaces of a finite dimensional vector space V, the dim $(W_1 + W_2)$ = dim W_1 + dim W_2 - dim $(W_1 \frown W_2)$.

Paper - II (Paper Code - MAT102)

1. State and prove Uniqueness of measures.
2. State and prove the Monotone Convergence theorem.
3. If (z, ||.||) is a normed space then show that (z, ||.||) is a Banach space.

Paper - III (Paper Code - MAT103)

1. Let $f(x) = \text{Sin } x$ for $x \varepsilon [0, \frac{л}{2}]$ and let $P = \{0, \frac{л}{2n}, \frac{2л}{2n}, \ldots\ldots\ldots\ldots \frac{nл}{2n}\}$ be the partition of $[0, \frac{л}{2}]$ then compute U (P,f) and L (P, f).
2. Prove that $\int_0^{\pi/2} \text{Cosxdx} = 1$
3. If $x = r\cos\theta$, $y = r\sin\theta$, find $\frac{r(x, y)}{r(r, \theta)}$ and $\frac{r(r, \theta)}{r(x, y)}$

Paper - IV (Paper Code - MAT104)

1. Discuss the origin and development of operation research.
2. Solve by Simplex method:
   Max $z = 8x_1 + 20x_2$
   Subject to:
   $2x_1 + x_2 \leq 80$------ Resource I
   $3x_1 + 4x_2 \leq 96$----- Resource II
   $(x_1, x_2) \geq 0$
   Find optional profit (Max z)
3. Write the dual of the following LPP.
   Maximize $z = 2x_1 - x_2$
   Subject to:
   $x_1 + 2x_2 = 5$
   $3x_1 + 7x_2 \leq 3$
   $(x_1, x_2) > 0$

Paper - V (Paper Code - MAT105)

1. In any topological space, prove that $\bar{A} = A \cup D(A)$.
2. Prove that euery T_2- space is a T_1- space but Converse is not true. Justify.
3. State and prove Cantor's Intersection theorem.

Paper - VI (Paper Code - MAT106)

1. Show that Linear spaces R (real) and C (complex) are normed linear spaces under the norm: $\| x \| = | x |, x \in R$.
2. If x and y are any two vectors in an inner product spaces x, then show that $| (x, y) | \leq \| x \| \| y \|$
3. State and prove Taylor's Theorem.

Paper - VII (Paper Code - MAT107)

1. Describe the various parts of CPU with its function.
2. Describe the process of inserting graphics.
3. Describe the various features of Taskbar.

नोटः- दत्त कार्य जमा करने की अंतिम तिथि 15/12/2022

GENERAL INSTRUCTION FOR ASSIGNMENT

1. Assignment in each course consists of 30% weightage whereas TEE consists of 70% weightage.
2. The assignment carrying equal weightage shall be evaluated for the purpose of examination. Assignment writing is compulsory.
3. If the assignment is not submitted before the prescribed date, the study required of the student will not be considered to have been completed and he/she will be declared as 'not completed' the course.
4. The weightage obtained by the candidate in assignment will be clubbed with the weightage obtained by a student at TEE of that course of the programme, therefore, it is in the interest of the student to submit the assignment work in time.
5. Assignment should be written very carefully and in own handwriting. It should not be copied from the learning materials.
6. Assignments can be submitted in the Answer Books provided to the students by Directorate of Distance Education, L.N. Mithila University, Kameshwarnagar, Darbhanga for this purpose or on A4 size paper.
7. The candidate must write his/her ***Enrolment No., Session, Programme, Course, Course Code, Course title, date of submission*** on the Assignments.
8. Assignment may be sent by Post also and the student must keep a proof of submitting assignment along with photocopy of the submitted assignment for future.
9. No assignment will be accepted after TEE of that course. Hence, assignment must be submitted on or before fixed date.
10. Assignment should be handwritten only. No typed or photocopy will be accepted.
11. Each and every assignment should be submitted separately.
12. Assignment may be written either in Hindi or English.
13. **PCP (Personal Contact Programme)** is organised by counseling P.G. Dept. to help in programme related problems.
14. The candidates are advised to attend PCP and they should come after reading the materials.
15. Project Work/Dissertation, wherever prescribed, must also be submitted by the fixed date, failing which the student will be deemed to have not completed in the concerned course.
16. Enrolled Students must visit the official website (www.ddelnmu.ac.in) regularly for update information.

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