MANONMANIAM SUNDARANAR UNIVERSITY

DIRECTORATE OF DISTANCE AND CONTINUING EDUCATION

INTERNAL ASSIGNMENT [redacted]

M. Sc Mathematics – Second Semester

Advanced Algebra

Sub-Code: SMAM21

SMAM21 Advanced Algebra.

1) a) Prove that the number e is transcendental.

(or)

b) Let $f(x) \in F(x)$ be of degree $n \geq 1$. Then there is an extension E of F of degree atmost $n!$ in which $F(x)$ has n roots.

2) a) If K is a finite extension of F, then $G(K, F)$ is a finite and its order, $O(G(K, F))$ satisfies $O(G(K,F)) \leq [K : F]$

(or)

b) The general polynomial of degree $n \geq 5$ is not solvable by radicals.

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M. Sc Mathematics – Second Semester

Real Analysis-II

Sub-Code: SMAM22

SMAM 22 Real Analysis - II

1) a) (i) For any sequence of set $\{E_i\}$, $m^*\left(\bigcup_{i=1}^{\infty} E_i\right) \leq \sum_{i=1}^{\infty} m^*(E_i)$.

(ii) Show that for any set A and for any $\varepsilon > 0$, there is an open set O containing A such that $m^*(O) \leq m^*(A) + \varepsilon$.

(or)

b) State and prove Fatou's Lemma.

2) a) State and Prove Riemann Lebesgue Lemma.

(or)

b) State and Prove Mean Value Theorem.

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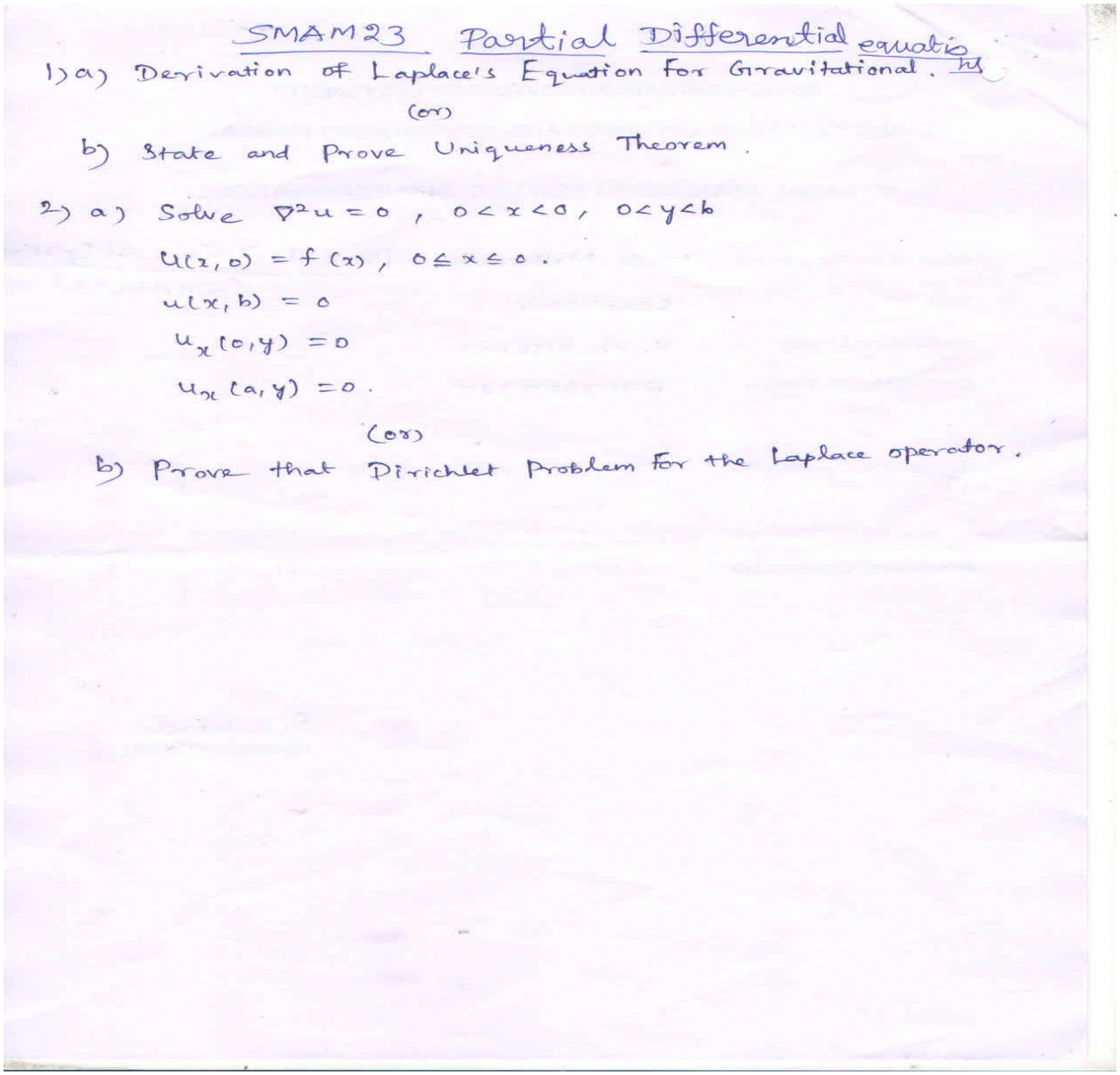
INTERNAL ASSIGNMENT [redacted]

M. Sc Mathematics – Second Semester

Partial Differential Equations

Sub-Code: SMAM23



SMAM23 Partial Differential equatio

1) a) Derivation of Laplace's Equation For Gravitational. Ms

(or)

b) State and Prove Uniqueness Theorem.

2) a) Solve $\nabla^2 u = 0$, $0 < x < 0$, $0 < y < b$

$u(x, 0) = f(x)$, $0 \leq x \leq 0$.

$u(x, b) = 0$

$u_x(0, y) = 0$

$u_x(a, y) = 0$.

(or)

b) Prove that Dirichlet Problem For the Laplace operator.

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INTERNAL ASSIGNMENT [redacted]

M. Sc Mathematics – Second Semester

Mathematical Statistics

Sub code : SMAE21

SMAE21 Mathematical statistics

1) a) Let the random variable X and Y have the joint p.d.f $f(x,y) = \begin{cases} x+y, & 0<x<1, 0<y<1 \\ 0, & \text{elsewhere} \end{cases}$

Find the correlation co-efficient of X and Y.

(or)

b) Compute the measures of skewness and Kurtosis of a Gamma Distribution.

2) a) Find the variance of Chi-Square distribution

(or)

b) State and prove the Box and Muller Transformation.

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INTERNAL ASSIGNMENT [redacted]

M. Sc Mathematics – Second Semester

Operations Research

Sub-Code: SMAE22

SMAE22 Operations Research.

1) a) Using North-West Corner Rule find a basic feasible solution to the following transportation problem.

Destination

Source (Origin)	W_1	W_2	W_3	a_i (Supply (Availability))
F_1	8	10	12	900
F_2	12	13	12	1000
F_3	14	10	11	1200
b_j	1200	1000	900	3100

Requirements

(or)

b) Explain about Minimal Spanning tree Algorithm.

2) a) Find the optimum integer solution to the following LPP.

Maximize $Z = x_1 + 4x_2$, Subject to the constraint LS

$2x_1 + 4x_2 \leq 7$, $5x_1 + 3x_2 \leq 15$;

where $x_1, x_2 \geq 0$ and are integers.

(or)

b) Explain about the basic elements of Queuing model.

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DIRECTORATE OF DISTANCE AND CONTINUING EDUCATION

INTERNAL ASSIGNMENT [redacted]

M. Sc Mathematics – Second Semester

Mathematical Documentation using LaTex

Sub-Code: SMAS21

SMAS21 Mathematical Documentation using LaTex

1) a) Explain about basics of Latex file.

(or)

b) Explain about document class.

2) a) Explain about changing font style.

(or)

b) Explain about text in boxes.