

Q.1.

University of Sargodha

B.A/B.Sc 15 Annual Examination 2007 Paper- A

Applied Mathematics

Time Allowed: 3 Hours

Merging Man and math

86

Maximum Marks: 100

Attempt six questions in all, selecting two questions from each section. Note:

Section-1 (a) Solve the differential equation.

ection-I

$$(2x+y+1)dx + (4x+2y-1)dy = 0$$

$$(2x+y+1)dx + (2x+2y-1)dy = 0$$

$$(2x+y+1)dx + (2x+2y$$

Solve the differential equation.

$$xp^2 + (y-1-x^2)p - x(y-1) = 0$$
 0.7 9.8 $m_{\rm e}^{(8)}$

Solve the initial value problem. Q.2.

$$(x^2 + 1)\frac{dy}{dx} + 4xy = x$$
, $y(2) = 1$ 8 16 Ex: 96 (9) class $(x^2 + 1)\frac{dy}{dx} + 4xy = x$, $y(2) = 1$ (month), (8)

thereafter the population increases at the rate of \sqrt{p} per month, when these are p = 0 fish in the farm, what is the field. A newly built fish farm is stocked with 400 fish at time t = 0 (month), p fish in the farm, what is the fish population at time 't'?

Solve the differential equation. Q.3.

Sopulation at time 't'?
$$(3y + 4xy^{2})dx + (2x + 3x^{2}y)dy = 0 \text{ (A) } 9 \text{ (B) } \text{ (B)$$

Solve by method of U.C

$$y'' - 3y' + 2y = 2x^{2} + 2xe^{x}$$

$$\frac{d^{2}y}{dx^{2}} - 4\frac{dy}{dx^{2}} + 4y = \frac{e^{2x}}{2}$$

$$69)$$

$$69$$

Find a particular solution of following. Q.4.

$$\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = \frac{e^{2x}}{1+x} \quad \text{(9)}$$
to solve the differential (8)

Method **3eries**

Section- II

Compute the inverse Laplace Transformation of the following. $\frac{s^3 + 3s^2 - s - 3}{(s^2 + 2s + 5)^2}$

(b) Find a positive root of a non linear equation, using Bisection Method. (8)

 $f(x) = x^3 - x^2 - 2x + 1.$

$$f(x) = x^3 - x^2 - 2x + 1.$$
(8)

2.6. (a) Use the Laplace Transformation Method to solve the following initial value
$$f(x) = x^3 - x^2 - 2x + 1.$$
Problem.
$$\frac{a^2 y}{dt^2} - 2 \frac{dy}{dt} = 20e^{-t} \cot t, y(0) = 0 = y'(0)$$
Problem.

Find the positive root of the equation.

$$x^{3} + x^{2} - x - 3 = 0$$
 Using (8)
Numeri I Anya.

the Regula-Falsi Method $e^x = 2x + 21$ Find the positive root ϕ^* the equation. Q.7.

by using Newton's Numeriad Anyl

Raphson Method with $z_i = 3$

P.T.O

(b) Prove that

$$\Delta \left(\frac{f_n}{g_n}\right) = \frac{g_n \Delta f_n - f_n \Delta g_n}{g_n g_{n+1}}$$

- Numerial (8)
 Any:
- Find the first three derivatives of f(x) from the following table at x = 19Q.8.

three derivatives of $f(x)$							
(11100			7	16	1.8	2.0	
Х	1.0	1.2	1.4	1.0			
		0.100	0.544	0.296	2.432	4.00	
f(x)	0	0.128	0.544	0.270			
		ــــــ <u>-</u>	4 - 41-0	given i	ntegral.		

Aumerica

Use the Simpson's Rule to approximate the given integral.

r = 6
with

Section- III

subject to the Constraints. $z = 9x_1 + x_2$ Find the maximum value of Q.9.

$$2x_1 + x_2 \le 8$$

$$4x_1 + 3x_2 \le 14$$

$$x_1, x_2 \ge 0$$

Comples (8)

(9)

(8)

(9)

(8)

(b) Minimize

$$-x_1 + 2x_2 \le$$

such that

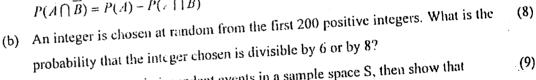
$$-x_1 + 2x_2 \le 2$$

$$x_1 + x_2 \le 4$$

$$x_1, x_2 \ge 3$$

 $x_1, x_2 \ge 0$ Using simplex method.

(a) If A and B are any two events defined in a sample space S, then (9) $P(A \cap \overline{B}) = P(A) - P(A \cap B)$ (8)



- If A and B are two independent events in a sample space S, then show that ii. \overline{A} and \overline{B} are independent.
- A and \overline{B} are independent. An event has the probability $p = \frac{3}{8}$. Find the complete Binomial Distribution
- A man draw two balls from a bag containing 3 white and 5 black balls. If he for n = 5 trials. receives Rs.70 for every white ball he draws and Rs.7 for every black ball, find Q.12. his expectation.
 - Write down the properties of Binomial Distribution.

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