

	MINISTRY OF EDUCATION, CULTURE, RESEARCH AND TECHNOLOGY <b>UNIVERSITAS NEGERI JAKARTA</b> FACULTY MATHEMATICS AND KNOWLEDGE KNOWLEDGE NATURAL <b>PRODI PHYSICS &amp; EDUCATION</b> <b>PHYSICS</b> Campus A UNJ Rawamangun, G-d. Hasjim Asj'arie Lt. 5 Jl. Rawamangun Advance No. 1 Jakarta 13220 Tel. 021-29266285/29266284	<b>EXAM END SEMESTER 118</b>	
		Calculus II	
		<b>Date and time</b>	Tuesday, 13 June 2023
		<b>O'clock</b>	08.00-09.40
		<b>Study Program</b>	Physics And Physics Education
		<b>Characteristic Exam</b>	Closed book
		<b>Lecturer</b>	Prof. Dr. Mangasi A. Marpaung Dr. Firm B. Prayitno Dr. Hadi Nasbey Upik Rahma Fitri, M.Pd

Instruction Processing:

1. Use paper Striped/plain size A4/Folio as sheet the answer.
2. Write your name & NIM and implementation date in the top right corner of each the page
3. Answer written with neat use color ballpoint pen Black blue

Take your pick 3 question for done

1. Decide all point critical Which Possible from function  $f(x, y) = -y^2 + 3x^3 - 4y + 9x$ . After that, look for the maximum/minimum value of the critical point (if any)

Instruction: use connection

$$D = D(x_0, y_0) = f_{xx}(x_0, y_0)f_{yy}(x_0, y_0) - f_{xy}^2(x_0, y_0)$$

2. Determine the value maximum of function  $z = -4x^3y^2$  Which limited by function  $x^2 + y^2 = 1$

Instruction: Equality Lagrange's constraints given by

$$\nabla f(x, y) = \nabla \lambda g(x, y)$$

3. Determine the center of mass of a thin plate bounded by the curves  $x = y^2$  and  $x = 2y - y^2$  if mass meeting on point  $(x, y)$  is  $\delta(x, y) = y + 1$

4. Finish equality differential following

$$\frac{dy}{dx} + xy = x; \text{ with } y(0) = -6$$

5. Look for it four derivatives  $(f_{xx}, f_{yy}, f_{xy}, f_{yx})$  second partial of:

$$f(x, y) = xe^y - \sin \frac{x}{y} + x^3y^2$$