CODE: MID-TH2-1718.01

FACULTY OF INFORMATION TECHNOLOGY
DEPARTMENT OF MATHEMATICS

SOCIAL REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

MIDTERM EXAM

Times: 50 minutes

THE01002. CALCULUS 2

Description of the test : this test includes 6 exercises with 7 questions. Points are distributed as follows:

Question	1	2	3	4	5	6	7
Points	1.0	2.0	1.5	1.0	1	1.5	2

Exercise 1. [1.0 pt] Express the following limit as a definite integral

$$\lim_{\|P\|\to 0} \sum_{k=1}^{n} \ln(1+c_k^2)\ \triangle x_k,$$

where $P = [x_1, \cdots, x_n]$ is a partition of the interval $[1, 2]$; $c_k \in [x_{k-1}, x_k]$, and $\triangle x_k = x_k - x_{k-1}$.

Exercise 2. [2.0 pt] Express the integral $\int_0^1 \sin(1+x^2)dx$ as a limit of Riemann sums. Do not evaluate the limit.

Exercise 3. [2.5 pt] Evaluate the following integrals

a) [1.5 pt] $\int x \ln(x+1)dx$.

b) [1.0 pt] $\int_1^\infty \frac{1}{x^4}dx$ (if it exists).

Exercise 4. [1.0 pt] Find the derivative with respect to x of the function

$$F(x) = \int_1^{2x+1} e^{\sin t}dt.$$

Exercise 5. [1.5 pt] Suppose that the growth rate of an organism at time t is given by

$$f(t) = t(25-2t).$$

Find the cumulative change of the organism between times 0 and 2.

Exercise 6. [2.0 pt] Find the average value of the function $f(x) = \frac{x^3}{\sqrt{1+x^2}}$ on $[0, \sqrt{3}]$.

LECTURER
Quang Sang PHAN

CODE: MID-TH2-1718.02

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MIDTERM EXAM

Times: 50 minutes

THE01002. CALCULUS 2

Description of the test : this test includes 6 exercises with 7 questions. Points are distributed as follows:

Question	1	2	3	4	5	6	7
Points	1.0	2.0	1.5	1.0	1	1.5	2

Exercise 1. [1.0 pt] Express the following limit as a definite integral

$$\lim_{\|P\|\to 0} \sum_{k=1}^{n} c_k \sqrt{2 + c_k^2}\ \triangle x_k,$$

where $P = [x_1, \cdots, x_n]$ is a partition of the interval $[-1, 1]$; $c_k \in [x_{k-1}, x_k]$, and $\triangle x_k = x_k - x_{k-1}$.

Exercise 2. [2.0 pt] Express the integral $\int_0^1 \ln \frac{2x+1}{x+1} dx$ as a limit of Riemann sums. Do not evaluate the limit.

Exercise 3. [2.5 pt] Evaluate the following integrals

a) [1.5 pt] $\int x \ln(x-1) dx$.

b) [1.0 pt] $\int_1^\infty \frac{1}{x^5} dx$ (if it exists).

Exercise 4. [1.0 pt] Find the derivative with respect to x of the function

$$G(x) = \int_1^{-2x+1} \cos(e^t + 1) dt.$$

Exercise 5. [1.5 pt] Suppose that the growth rate of an organism at time t is given by

$$f(t) = 2t(50 - \frac{1}{t}).$$

Find the cumulative change of the organism between times 0 and 5.

Exercise 6. [2.0 pt] Find the average value of the function $f(x) = \frac{1}{x\sqrt{\ln x}}$ on $[1, e]$.

LECTURER
Quang Sang PHAN