中原大學 97 學年度碩士班入學考試

4 月 13 日 14:00~15:30 企業管理學系乙組

誠實是我們珍視的美德，
我們喜愛「拒絕作弊，堅守正直」的你！

科目：微積分

□可使用計算機，惟僅限不具可程式及多重記憶者　■不可使用計算機

1. Evaluate the limits (10%)

(a) $\lim_{x\to\infty}\left(1+\frac{r}{x}\right)^t$, (b) $\lim_{x\to 0}\frac{\sin \pi x}{x}$.

2. Graph the function (10%)

$y=x^4-4x^3+10$.

3. Find the area of the region bounded by the graphs of $y=\sqrt{x-2}$ and

$y=\frac{1}{2}x-1$. (10%)

4. Evaluate the integral $\int_0^1 \frac{1-\sqrt{x}}{1+\sqrt{x}}dx$. (10%)

5. The marginal cost of producing x tables per week is $C(x)=50+\frac{1}{3}x$

dollars. The total cost of producing 100 tables in a week is \$10000. (10%)

(a) What are the weekly fixed costs?

(b) What is the weekly total cost function?

6. Find the consumers' surplus for the demand function $D(x)=50-x^{3/2}$

at consumption level $x_0=9$. (10%)

7. Find the maximum and minimum values of $f(x,y)=x^2+y^2$ subject to

the constraint $g(x,y)=x^2-2x+y^2-4y=0$. (10%)

8. Find the Maclaurin series of the function $f(x)=e^{-x}$. (10%)

9. $\alpha>0$, evaluate the integral $\int_0^1 \frac{x^\alpha-1}{\ln x}dx$. (10%)

10. Evaluate the double integrals (10%)

(a) $\int_0^1\int_0^{\sqrt{1-x^2}} e^{x^2+y^2}dydx$, (b) $\int_0^\pi\int_x^\pi \frac{\sin y}{y}dydx$.