A

CALCULUS - *for Computer Science and Engineering*

Final Exam

Department of Computer Science and Engineering
National Sun Yat-sen University

January 12, 2011, 13:30~ 15:30

NAME:	Student ID Nr.:
Instructor: 柯正雯	Signature: _____

General Instructions:

1. Do not open this exam until you are told to begin.
2. This exam has 4 pages including this cover. There are 25 questions.
3. Do not separate the pages of the exam. If any pages do become separated, write your name on them and point them out to your instructor when you turn in the exam.
4. Please read the instructions for each individual exercise carefully. One of the skills being tested on this exam is your ability to interpret questions, so instructors will not answer questions about exam problems during the exam.
5. Do NOT mark anything unnecessary on this document except for your answers.
6. Write your answers in the right place only. Include units in your answers where appropriate.
7. You may use your calculator.
8. Do NOT use pencils but black or blue ball pens for your answers.
9. Please turn off all cell phones and pagers and remove all headphones.

Problem	1-12	13-22	23-25	Total
Points	48	40	12	100
Score				

Please fill in the following blanks with your answers. *(4% for each)*

1. $\int_3^1 7\,dx$ = _____

2. $\int_a^b x^3\,dx \quad (a<b)$ = _____

3. The value of $\int_a^b (x^4-2x)\,dx$ can be minimized if :
   a = _____ , b = _____ (2% for each)

4. $\int_0^{\pi/4} \tan^2 x\,dx$ = _____

5. $\int_{-3}^{-1} \frac{y^5-2y}{y^3}\,dy$ = _____

6. $\int_1^2 \frac{\ln x}{x}dx$ = _____

7. $\frac{d}{dx}\int_0^{x^3} e^{-t}\,dt$ = _____

8. $y=\int_{-1}^{x} \frac{t^2}{t^2+4}\,dt-\int_3^{x} \frac{t^2}{t^2+4}\,dt$, $\frac{dy}{dx}=$ _____

9. $\int 2x(x^2+5)^{-4}\,dx$ = _____

10. $\int \frac{1}{\theta^2}\sin\frac{1}{\theta}\cos\frac{1}{\theta}d\theta$ = _____

11. $\int (\cos x)e^{\sin x}\,dx$ = _____

12. $\int_2^4 \frac{dx}{x\ln x}$ = _____

13. $\int_0^{\ln\sqrt{3}} \frac{e^x dx}{1+e^{2x}}$ = _____

14. The area of the region enclosed by the curves: $x + y^2 = 3$ and $4x + y^2 = 0$ is
A = _____

15. $\int \frac{\log_{10} x}{x} dx$ = _____

16. Ordering the following functions from slowest growing to fastest growing as $x \to \infty$: a. 2^x b. x^2 c. $(\ln 2)^x$ d. e^x
_____ (e.g. abcd)

17. $\int x^3 e^x \, dx$ = _____

18. $\int x^3 \sqrt{x^2+1}\, dx$ = _____

19. $\int \sin 2x \cos 4x \, dx$ = _____

20. $\frac{2x^3 - 4x^2 - x - 3}{x^2 - 2x - 3}$ can be expressed as : $Ax + \frac{Bx + C}{x^2 - 2x - 3}$,
where A = _____ (1%) , B = _____(2%) , C = _____ (1%)

21. $\int \frac{2x^3 - 4x^2 - x - 3}{x^2 - 2x - 3} dx$ = _____

22. $\int \frac{1}{x\sqrt{x+9}} dx$ = _____

23. $\int_{-\infty}^{-2} \frac{2dx}{x^2-1}$ = _____

24. $\int_{2}^{4} \frac{dt}{t\sqrt{t^2-4}}$ = _____

25. $\int_{-1}^{4} \frac{dx}{\sqrt{|x|}}$ = _____

(End of this exam.)