

國立高雄大學九十七學年度轉學招生考試試題

科目：微積分
 考試時間：80 分鐘

系所：
 土木與環境工程學系轉二年級
 本科原始成績：100 分

是否使用計算機：是

1. Find the limit

a. $\lim_{x \rightarrow 0} \frac{\sin x(1 - \cos x)}{4x^2}$ (5)

b. $\lim_{x \rightarrow \infty} x^{1/x}$ (10)

2. Find the dy/dx of the function (30)

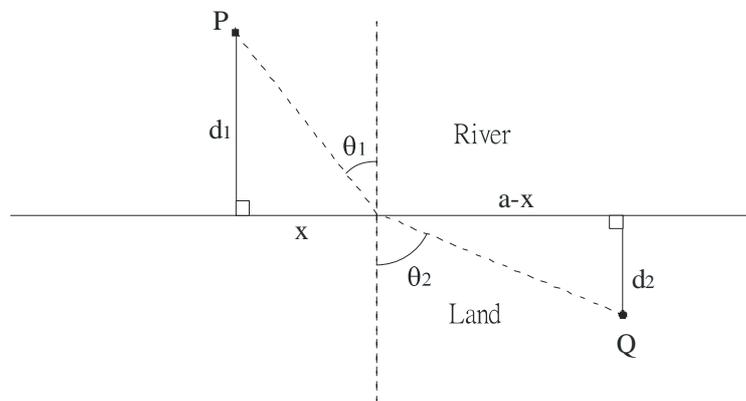
a. $y = 5x \sec x + x \tan x$

b. $\tan(x + y) = x$

c. $y = (x - 2)^{x-2}$

3. Evaluate $\int x^5 \ln x \, dx$ (10)

4. A man can row at v_1 km per hour and walk at v_2 km per hour. If θ_1 and θ_2 are the magnitudes of the angles. P is the starting point, show that the man will reach point Q in the least time when $\frac{\sin \theta_1}{v_1} = \frac{\sin \theta_2}{v_2}$. (15)



5. Find the center of mass of a solid hemisphere of radius R m if its density at height z m about the base plane of the hemisphere is $\delta_0 z$ kg/m^3 . (15)

6. Find the area of the surface formed by revolving the circle $r = f(\theta) = 2 \cos \theta$ about the line $\theta = \pi/2$. (15)

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是否使用計算機：否

Please write all your answers on the answer sheets.

I. Choose the answer that best completes the sentence. 20%

1. _____ remain some problems to solve, but the negotiations appear to be moving toward a successful conclusion.
(A) They (B) There (C) It (D) We
2. There are over thirty thousand Chinese living in Chinatown, _____ have never been out of town because they don't speak any English.
(A) some of them (B) some of whom (C) some of which (D) some of those
3. The poor family struggled to _____ each day.
(A) leave behind (B) be at a loss (C) depart from (D) make ends meet
4. During tough negotiations, such as the ones we have witnessed over the last week or so, neither side wants to _____.
(A) give in (B) get by (C) take hold (D) come on
5. _____ the right to limit quantities when you are selling seasonal items that are in high demand.
(A) Daily reserve (B) Reserve often (C) Always reserve (D) Reserve generally

II. Choose the best answer to complete the text. 20%

Questions 1-2 refer to the following letter

EZ Phones 1031 Park Road Johnsonville Wellington 1003 NEW ZEALAND	August 30, 20__
Heather Taylor 99 Shortland St. Auckland 1007 NEW ZEALAND	
Dear Ms. Taylor:	

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Due _____ insufficient funds in your checking account, Bonds Bank returned

1. (A) on
(B) to
(C) from
(D) of

You check in the amount of \$123.39, dated August 1, to EZ Phones. Yesterday we contacted Bonds Bank to find out if the balance in your account had changed. The bank manager confirmed that there is still not enough money in your account to cover check #347.

Line 12 of our cellular phone contract states that EZ phones charges its customers \$35 for all dishonored checks. We will add this amount to your next bill with the overdue _____.

2. (A) equipment
(B) balance
(C) credit
(D) contract

Please contact us by phone to discuss this matter further. In the event of a bank error, EZ Phones will return this money to you in the form of a credit.

Thank you,
Ashley Harries
Accountant

Questions 3-5 refer to the following article.

Reducing Energy Costs

People everywhere becoming concerned about the high energy prices. _____

3. (A) Rise
(B) Rose
(C) Risen
(D) Rising

energy costs are forcing many offices to implement certain energy-saving measures. For example, special energy-efficient lighting system becoming more and more common. There energy-saving lights remain on in an _____ room but switch off

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4. (A) occupy
(B) occupied
(C) occupying
(D) occupancy

when the room is not use. Ambient room temperature is another area of concern. Many offices now have a policy of keeping the temperature slightly higher in the summer and slightly cooler in the winter than _____ did in the past. This is

5. (A) they
(B) them
(C) he
(D) it

actually one of the most effective energy-saving measures that can be taken. Changing the room temperature by just a few degrees can mean many hundreds of dollars of savings in energy costs without any serious sacrifice of comfort.

III. Read the following passages and answer the questions that follow. 60%

Questions 1-4 refer to the following bulletin.

ADOPT A DOG!

A great opportunity for our employees to adopt a loyal friend of the company! Five of our guard dogs are scheduled to retire from active service at our warehouses at the end of June.

Our company adopt-a-dog program gives you the opportunity to bring a special dog into you life while at the same time providing these deserving animals with a living home. All of our dogs are very intelligent, loyal, and highly trained.

GIVE ONE OF OUR RETIREES A GOOD HOME!

- 2 German shepherd females
1 Doberman male
2 Rottweiler females

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Meet the dogs

Where: In the east parking lot, next to the Security Office

When: Thursday, July 25, 3:00-6:00

The dogs will be there for you to meet and play with, and their handlers will be available to answer your questions. We will also have application on hand for everyone interested in signing up to adopt one of these special animals.

3-month trial in your home

If returned, no questions asked

Not recommended for homes with young children

CALL TRACY FOR MORE DETAILS

403-555-8563x21

1. How many breeds are up for adoption?
 - (A) One
 - (B) Two
 - (C) Three
 - (D) Four
2. Why does the company have dogs?
 - (A) To protect warehouse property
 - (B) To protect employees'homes
 - (C) To protect company offices
 - (D) To supply guard dogs for other companies
3. The word *retire?* in line 3, is closest in meaning to
 - (A) change
 - (B) start again
 - (C) rest
 - (D) stop working
4. Why might the company be giving these dogs away?
 - (A) they may be too aggressive.
 - (B) Their contracts may be up.
 - (C) They may be too friendly.
 - (D) They may be getting too old for this work.

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Questions 5-7 refer to the following advertisement

DOWNTOWN DELUXE

The recently completed Menlo Industrial Park is open for inspection. Prospective tenants may make appointments to discuss their space requirements with our sales representatives. The Park can accommodate corporations with hundreds of employees as easily as it can operations with only two employees. All services and security are state of the art. Each rental unit comes with a complete shower room and private gymnasium. Employee health means corporate health.

5. What is this an advertisement for?
 - (A) A luxury apartment
 - (B) A boutique
 - (C) A restaurant
 - (D) Office space
6. How are the facilities generally described?
 - (A) Artistic
 - (B) Easy to operate
 - (C) Very up-to-date
 - (D) Reasonable
7. What does each unit include?
 - (A) Many long tables
 - (B) Wood on the walls
 - (C) A shower
 - (D) Modern lighting

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Questions 8-12 refer to the following advertisement

House For Sale

Red Rose Garden, Pudong

3-storey house, 509 sqm build-in, 312.9 sqm garden. Asking RMB 13 million (USD1.57 million).

MP:13761973547 Tel:021-58609228

Fax: 021-58609728

Job Wanted

Cherry, 24, a shining girl, good at spoken English and Putonghua. Now I am an international trade company in Guangzho. I am kind-hearted, hard-working and healthy, and would like part-time work offering Putonghua lessons to foreign friends. If you are interested, please email me at cherry@hotmail.com

Beijing Snow World Ski Park

Price: 18 yuan (ticket), 50 yuan/hour on weekdays and 70 yuan/hour on weekends, 120 yuan/four hours on weekdays and 190 yuan/four hours on weekends.

Tel: 010-69191617

8. If an Australian student wants to learn Chinese, he or she can _____.
- (A) call 021-58609228
 - (B) fax 021-58609728
 - (C) e-mail cherry@hotmail.com
 - (D) telephone 010-69191617
9. How many square metres is the garden of the house for sale?
- (A) 509 sqm.
 - (B) 428.8 sqm.
 - (C) 312.9 sqm
 - (D) 80.2 sqm
10. Where is Cherry working now?
- (A) in Shanghai
 - (B) in Guangzho
 - (C) in Beijing
 - (D) in Pudong

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11. If Nick goes skiing on _____ in Beijing Snow World Ski Park, he will have to pay more money than on Tuesday.
- (A) Sunday
 - (B) Friday
 - (C) Wednesday
 - (D) Monday
12. If you want to ski for four hours on weekdays, how much money will you pay at least?
- (A) 138 yuan
 - (B) 200 yuan
 - (C) 208 yuan
 - (D) 280 yuan

Questions 13-15 refer to the following manual.

Battery Installation for Nimea X-37 Flash Attachment

Congratulations on your purchase of the new Nimea X-37 Flash Attachment! After using our product, you will be pleased with our advanced lighting power.

Prepare for A-size batteries. Always use new batteries only. To install batteries, simply turn the flash attachment over and slide the battery case cover marked "batteries?" to the right(as indicated by an arrow). Note that the bottom two batteries should be installed with the + side facing to the left, whereas the top two batteries should be installed with the + side facing the right. A diagram is provided inside the battery case for your convenience.

In cold weather, allow more time for the batteries to charge. Avoid water coming into contact with the battery case. Remove and properly discard old batteries when the red light above the battery case flashes.

With proper use, your Nimea X-37 Flash Attachment should provide years of problem-free, professional assistance for all your photographic needs.

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13. What is the Nimea X-37 designed to be used with?
- (A) A computer
 - (B) A cellphone
 - (C) A camera
 - (D) A copier
14. How many batteries are marked ? ?
- (A) One
 - (B) Two
 - (C) Three
 - (D) Four
15. Which piece of advice is NOT given in the manual?
- (A) Use only new batteries
 - (B) Use re-chargeable batteries
 - (C) Keep the flash attachment away from water
 - (D) Expect a longer charging time in winter