

國立高雄大學九十四學年度轉學三年級招生考試試題

系所組別：土木與環境工程學系

科目：工程數學

考試時間：90 分鐘

本科原始成績滿分 100 分

1. 試求下列微分方程式之通解

(a) $(x^3 + 3xy^2)dx + (3x^2y + y^3)dy = 0$ (10%)

(b) $y'' + y = x$; $y' = dy/dx$ (10%)

(c) $x^2y'' - 3xy' + 4y = 12$ (10%)

2. 試求下列函數之 Laplace 轉換

(a) $\cos(at)$, a 為常數 (5%)

(b) t^5 (5%)

(c) $\sin^2 t$ (10%)

3. 利用分離變數法(separation of variable)求解下列偏微分方程 (25%)

$$\frac{\partial^2 u}{\partial x^2} - \frac{\partial u}{\partial t} = 0; \quad 0 < x < L, \quad t \geq 0$$

邊界條件: $u(x=0, t) = 0, \quad u(x=L, t) = 0$

初始條件: $u(x, t=0) = x(L-x)$

4. 求下列矩陣 A 之特徵值(eigenvalue)與對應之特徵向量(eigenvector) (10%)

$$A = \begin{bmatrix} 3 & 4 \\ 4 & -3 \end{bmatrix}$$

5. 求曲面積分 $\iint_S \mathbf{F} \cdot \mathbf{n} dA$ 之值，其中 \mathbf{n} 為曲面 S 之單位法向量(unit normal vector)，

$$\mathbf{F} = 2z\hat{i} + (x - y - z)\hat{k}; \quad S: z = x^2 + y^2, \quad z \leq 6 \quad (15\%)$$

國立高雄大學九十四學年度轉學招生考試試題

系所組別：土木與環境工程學系	科目：英文
考試時間：90 分鐘	本科原始成績滿分 100 分
<p>Below you find 40 easy questions to test your English. Each question counts 2.5 points. Good luck!</p>	
<p>Below you find the beginning of sentences as they can be found in on-line news. But how do the sentences continue? Only one answer is correct.</p>	
<p>1) Former world champion Mike Tyson says he will quit</p> <p>a) his fight which many expected him to win. b) boxing after losing to McBride. c) hesitatingly walking to his corner after being pushed down to the floor by McBride.</p> <p>2) Italians are going to the polls on Sunday and Monday in a referendum</p> <p>a) will vote on proposals to ease rules restricting assisted fertility. b) have collected four million signatures to force the referendum on whether to ease the rules. c) that the Roman Catholic Church has asked them to boycott.</p> <p>3) Some of the world's poorest countries have welcomed a debt relief deal</p> <p>a) made by their richer lenders. b) welcomed the deal - but say they want more nations to benefit. c) should benefit from 100% debt relief within 12-18 months.</p>	

- 4) Peace talks on the troubled Sudanese region of Darfur have failed
- will continue consultations on Sunday.
 - of the mediating teams.
 - to begin for a second day running.
- 5) Ethiopia's main opposition party is demanding the release of its leader who
- were beaten by police with fists and clubs.
 - the violence and resolve the dispute over the elections.
 - it says has been placed under house arrest.
- 6) World health officials say they are moving closer to the global eradication
- two years ago polio immunisation was halted.
 - of polio.
 - of polio is northern Nigeria.
- 7) The Afghan government has confirmed it freed
- the mother of the man suspected of kidnapping an Italian aid worker.
 - the mother of suspected kidnapper Shah was released along with three other detainees.
 - reportedly identified Mr Shah as her abductor to Italian police.
- 8) In 1980 Bangladesh produced just over 40 million kilograms of tea and more than
- three quarters of it was shipped overseas.
 - new variety of tea that has just been developed.
 - much of the work took place in the Institute's tea tasting room
- 9) Action movie star Jackie Chan has apologised to the people of Taiwan
- had prompted calls for Chan's films to be banned in Taiwan.
 - over comments he made about last year's elections.

c) as "the biggest joke in the world".

10) The work of Mexican artist Frida Kahlo forms the main summer exhibition

a) died in Mexico City, aged 47, on 13 July 1954.

b) among 80 of Kahlo's paintings on display are two donated by pop star Madonna.

c) at the Tate Modern in London.

One word is missing. Which one?

11) More than 20 million people have visited the art gallery, _____ in an old power station.

a) settled

b) housed

c) allocated

12) A _____ rumour that Michael Jackson has tried to kill himself is being used to spread an e-mail virus.

a) fraud

b) fake

c) forge

13) Film, TV and music makers are figuring out how to _____ in a digital era where the consumer is in control.

a) sustain

b) subsist

c) survive

14) At least two die in bombs attacks in Iran, as the country prepares for _____ next week.

a) selections

b) choice

c) elections

15) The last remaining _____ around Bolivia's main city La Paz are lifted, allowing

fuel in for the first time in weeks.

- a) locks
- b) blockades
- c) blocks

16) A test indicates a US cow may have BSE, but further tests are needed to _____ the case.

- a) confirm
- b) establish
- c) reinforce

17) As the jury in the Michael Jackson trial continues to _____ a verdict, the atmosphere among fans and police is becoming increasingly tense.

- a) bargain
- b) discuss
- c) reason

18)

Taiwan is the island which has for all practical purposes been _____ for half a century but which China regards as a province that must be re-united with the mainland.

- a) disconnected
- b) independent
- c) isolated

19)

Legally, most nations - and the UN - _____ the position of the Chinese government that Taiwan is a province of China.

- a) agree
- b) admit
- c) acknowledge

20)

Taiwan is considered to have achieved an economic miracle, becoming one of the world's top _____ of computer technology.

- a) producer

- b) engineer
- c) farmer

Below you find a news report. What do the word in the headline mean?

21-23)

Big Apple fails U.S. quest for the Games

Organizers of New York's bid for the 2012 Summer Olympics owe at least an apology to Washington, San Francisco and Houston -- its top competitors for the U.S. Olympic Committee nomination for those Games.

21

- a) Big Apple = New York
- b) Big Apple = Olympic games
- c) Big Apple = Washington

22

- a) quest = apology
- c) quest = nomination
- c) quest = bid

23

- a) the Games = Olympic Committee
- b) the Games = Summer Olympics
- c) the Games = San Francisco

24-26)

G-8 pact slates \$40 billion in debt relief

The world's richest countries agreed yesterday on a historic deal to write off more than \$40 billion of debt owed by the poorest nations.

24)

- a) G-8 = poorest nations
- b) G-8 = world's richest countries
- c) G-8 = historical deal

25)

- a) debt relief = historic deal
- b) debt relief = debt owed by the poorest nations
- c) debt relief = write off more than \$40 billion of debt

26)

- a) pact = debt owed by the poorest nations
- b) pact = deal
- c) pact = write off

27-30)

Oil prices, imports boost trade deficit

The U.S. trade deficit rose to \$56.96 billion in April as a big jump in exports was swamped by record foreign oil prices and heavy American demand for imports.

27)

- a) boost = rose
- b) boost = billion
- c) boost = demand

28)

- a) Oil = foreign oil
- b) Oil = big jump
- c) Oil = swamped

29)

- a) imports = jump in exports
- b) imports = demand for imports
- c) imports = trade deficit

Grammar, Grammar, Grammar. Only one sentence is correct.

30)

- a) I am waiting for John.
- b) I am waiting of John.
- c) I am waiting John.

31)

- a) It very much depends of you.
- c) It is very much depending on you.
- c) It very much depends on you.

32)

- a) I rely of his help.
- b) I rely with his help.
- c) I rely on his help.

33)

- a) I am concerned on you.
- b) I am concerned about you.
- c) I am concerned at you.

34)

- a) I consider buy of a car.
- b) I consider buying a car.
- c) I consider the buying a car.

35)

- a) I consider the acquisition of a business.
- b) I consider an acquisition of a business.
- c) I consider acquisition of a business.

36)

- a) I do not have some choice.
- b) I do not have any choice.
- c) I do not have no choice.

37)

- a) Bill asked me the street is where.
- b) Bill asked me where is the street.
- c) Bill asked me where the street is.

38)

- a) The export is much smaller as expected.
- b) The export is more small than expected.
- c) The export is much smaller than expected.

39)

- a) "Who gave you the book?"

"It's me who got the book from Mary".

b) "Who gave you the book?"

"It's the book which I got from Mary".

c) "Who gave you the book?"

"It's Mary who gave me the book".

40)

a) What a wonderful sound!

b) How a wonderful sound!

b) A how wonderful sound!