

中原大學 97 學年度大學甄選入學考試

4 月 12 日 12:30~13:30

甄選系組：化學工程學系（個人申請）

科目：基本能力測驗

誠實是我們珍視的美德，
我們喜愛「拒絕作弊，堅守正直」的你！

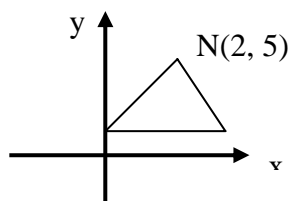
（共 3 頁第 1 頁）

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

作答時請標明題號 依序寫字答案紙上，請勿答於本卷上面

1-10 選擇題，每題 5 分

1. The number 5,260 is not divisible by which number?
(A. 5 B. 10 C. 2 D. 3 E. 4)
2. Two rational numbers have a sum of 12 and a difference of -8. They are
(A. 12, -8 B. 2, 6 C. 6, 6 D. 7, 5
E. 2, 10)
3. A bush casts a shadow 120cm long. If a 180-cm-tall person casts a shadow 270 cm long. How tall is the bush?
(A. 70 cm B. 80cm C. 90cm D. 100cm
E. 60cm)
4. What will be the coordinate of point N, if the triangle is rotated 90° counterclockwise about the origin?
(A. (-5, 2) B. (-5, -2) C. (5, 2) D. (5, -2)
E. (-2, 5))



5. On Monday, Joseph began reading a book from page 1. On Saturday, he had read up to page 185. If he read the same number of pages each day, how many pages did he read on Thursday?
(A. p.111 B. p.100 C. p.148 D. p.74 E. p.90)
6. John has made eight equal payments for his new wash machine. So far he has paid NT\$9,600. If he has four more equal payments to make. What is the cost of the machine?
(A. \$12,800 B. \$14,400 C. \$12,000 D. \$13,600
E. \$15,000)

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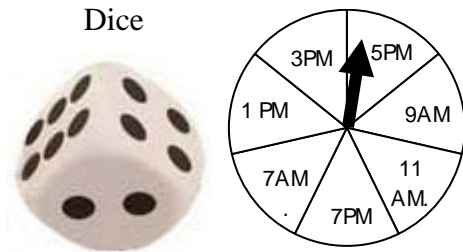
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7. After tossing a dice and spinning the spinner, what is the probability to toss number 4 and spin out “morning”?
- (A. $1/42$ B. $1/18$ C. $1/12$
D. $1/24$ E. None of above)



8. In the beginning of one day, 6000 passengers checked in a local airport. The first flight left at 8:00AM, with flights scheduled every 30 minutes in average. If each flight holds 200 passengers, at what time approximately all passengers will be able to leave the airport?
- (A. 6:00pm B. 6:30pm C. 7:00pm D. 7:30pm
E. 8:00pm)
9. Joanna and her four friends plan to rent bicycles to travel around a lake.

	Weekdays	Weekends
Single-seat	\$50/hr	\$100/hr
Two-seat	\$100/hr	\$150/hr
Three-seat	\$200/hr	\$250/hr

Two of her friends insist to ride on the same bicycle. How much are they going to pay to save the most on Saturday?

- (A. \$300 B. \$350 C. \$500 D. \$400 E. \$450)
10. A train is running in 120 km/hr toward Taipei Train Station. A gentleman is walking on the aisle toward the head of the train in 5 km/hr. At the same time, he is eating a long hot dog in 1 km/hr. On the hot dog, there is an ant running away in 0.1 km/hr for survival. What is the speed of the ant approaching the train station (before being eaten)?
- (A. 123.9 B. 115.9 C. 124.1 D. 116.1 E. 125.1)
km/hr

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11-18 問答題

11. While an Mg atom loses one electron to become Mg^+ , which has the same number of electrons with Na. However, the physical and chemical properties of Mg^+ and Na are very different. Please give your explanation. (5%)

12. Please make an atomic balance to the reaction equation shown below. (5%)



13. The ideal gas equation: $PV=nRT$, where P is the gas pressure in atm, V the volume of the gas in Liter, n the moles of the gas, R a constant, and T the temperature of the gas in K. Please tell the unit of R. (5%)

14. When a radiation (light) is considered as a wave, the velocity of the radiation wave reduces while it enters to water from air. Why? (5%) How do you predict the velocity of the radiation in water (5%).

15. 水的分子量只有 18 g/mol，沸點卻高達 100 °C，為甚麼。(5%)

16. 目前全球暖化嚴重，一個方法是限制二氧化碳排出到大氣中的量。於是石油公司在汽油中加入了由玉米做成的酒精，宣稱可以減少二氧化碳排出到大氣中的量，可是燃燒酒精依然會產生二氧化碳，關於這個問題，你如何解釋。(5%)。

17. 石油快要用盡，我們能有怎樣的替代能源，請試舉三例說明之。(9%)

18. 請說明你所知道的奈米科技、台塑六輕、以及友達公司。(6%)