注意：考試開始鈴響前，不得翻閱試題，

並不得書寫、畫記、作答。

國立清華大學 113 學年度學士後醫學系單招試題

系所班組別：學士後醫學系
智慧資訊科技組

科目代碼：0104

考試科目：資訊科學

—作答注意事項—

1. 請核對答案卡上之准考證號、科目名稱是否正確。
2. 作答中如有發現試題印刷不清，得舉手請監試人員處理，但不得要求解釋題意。
3. 答案卡限用 2B 鉛筆畫記；如畫記不清（含未依範例畫記）致光學閱讀機無法辨識答案者，其後果一律由考生自行負責。
4. 其他應考規則、違規處理及扣分方式，請自行詳閱簡章附錄上「**國立清華大學試場規則及違規處理辦法**」，無法因本試題封面作答注意事項中未列明而稱未知悉。

國立清華大學 113 學年度學士後醫學系單獨招生試題

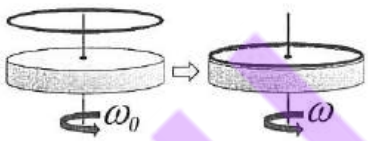
考試科目(科目代碼)：資訊科學 (0104)

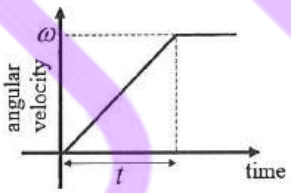
【單選題】 全部共 40 題，共計 150 分

第 1 題至第 25 題每題 3 分，答錯倒扣 0.75 分**，未作答，不給分亦不扣分**

第 26 題至第 40 題每題 5 分，答錯倒扣 1.25 分**，未作答，不給分亦不扣分**

1. A uniform disk of mass m and radius R (so the moment of inertia $I_{CM} = \frac{1}{2}mR^2$) is rotating about its symmetric axis at an angular velocity ω_0. A ring of the same mass m and radius R originally at rest suddenly drops on the disk. The coeffieient of kinetic friction between the disk and the ring is μ. How long does it take for the ring to reach a final angular velocity ω and rotate together with the disk as shown in the right figure? The gravitational acceleration is g.





(A) $\frac{\omega_0 R}{2\mu g}$

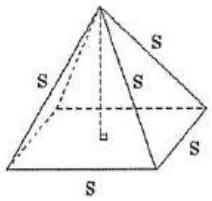
(B) $\frac{\omega_0 R}{3\mu g}$

(C) $\frac{\omega_0 R}{4\mu g}$

(D) $\frac{\omega_0 R}{16\mu g}$

(E) $\frac{\omega_0 R}{\mu g}$

2. Determine the height of the center of mass of a solid uniform pyramid that has four triangular faces and a square base with equal sides all of length S as shown in the figure. The height is measured from the bottom of the pyramid.



(A) $\frac{S}{3}$

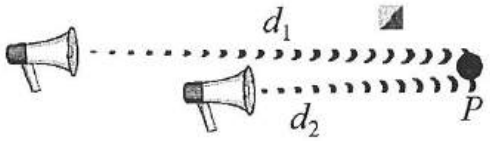
(B) $\frac{\sqrt{3}S}{8}$

(C) $\frac{\sqrt{2}S}{8}$

(D) $\frac{\sqrt{2}S}{6}$

(E) $\frac{S}{4\sqrt{2}}$

3. Two speakers both produce sound wave of power = 400π Watt, frequency = 170 Hz, and sound velocity = 340 m/s. They act as point sources and propogate in all directions. The output of the two speakers are synchronized and have the same phase. They are placed at different locations and the distances between the speakers and the observer P are d_1 = 10 m and d_2 = 5 m, respectively. What is the intensity of the sound wave detected by the observer? (The effect of interference should be considered.)



(A) 1 W/m^2

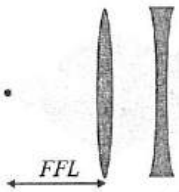
(B) 2 W/m^2

(C) 3 W/m^2

(D) 5 W/m^2

(E) 9 W/m^2

4. Two thin lenses form a compound lens system. The front focal length (*FFL*) of this compound lens system is defined as the distance between a point source and the front lens so that the light passing this system will become parallel. In the figure, the two lenses have focal length $f_1 = 10$ cm and $f_2 = -10$ cm, respectively, and are separated by a distance d = 5 cm. What is the *FFL* of this compound lens system?



(A) 5 cm

(B) 10 cm

(C) 12.5 cm

(D) 25 cm

(E) 30 cm

5. Which of the following statements is correct?

(A) The surface charge density of a perfect conductor must be uniform.

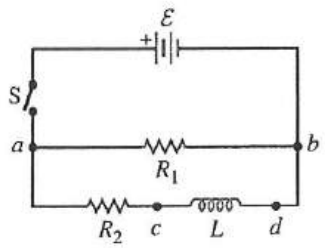
(B) The electric field line is the trajectory of a charged particle under electric field.

(C) The conductor can be thought of as a dielectric material with dielectric constant $\kappa = 0$.

(D) If the electric potential at some position is zero, the electric field at that position must also be zero.

(E) The surface of a perfect conductor is an equipotential surface.

6. In the circuit, if the switch S is closed for a long time, and is then opened. Just after the switch is opened, what is the potential difference across the inductor L?



(A) ε

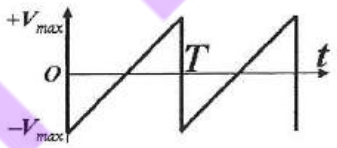
(B) $\frac{\varepsilon R_1}{R_2}$

(C) $\frac{\varepsilon(R_1+R_2)}{R_2}$

(D) $\frac{\varepsilon R_1}{(R_1+R_2)}$

(E) $\frac{\varepsilon R_2}{(R_1+R_2)}$

7. What is the root-mean-square value of a triangular wave with its maximum voltage at $\pm V_{max}$ and a period of T.



(A) $\frac{V_{max}}{\sqrt{2}}$

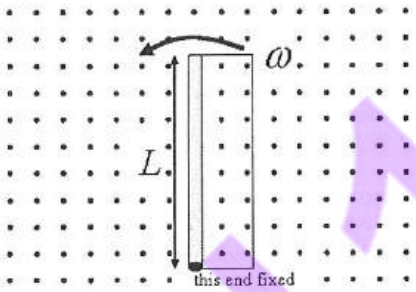
(B) $\frac{V_{max}}{2}$

(C) $\frac{V_{max}}{\sqrt{3}}$

(D) $\frac{V_{max}}{3}$

(E) $\frac{V_{max}}{2\sqrt{2}}$

8. A solid rod with length L, resistance R and mass M initially rotates with angular velocity ω in a uniform magnetic field B. The two ends of the rod are connected by a conducting wire without resistance. According to Lenz's Law, the induced current will oppose the change of magnetic flux. In this case, the induced current will produce a torque to slow down the rotation speed. What is the torque? Take the pivot point as the origin.



(A) $\frac{\omega B^2 L^4}{R}$

(B) $\frac{\omega B L^2}{R}$

(C) $\frac{\omega B L^2}{2R}$

(D) $\frac{\omega B^2 L^4}{4R}$

(E) 0

9. Which quantity cannot be measured by Hall effect?

(A) The external magnetic field

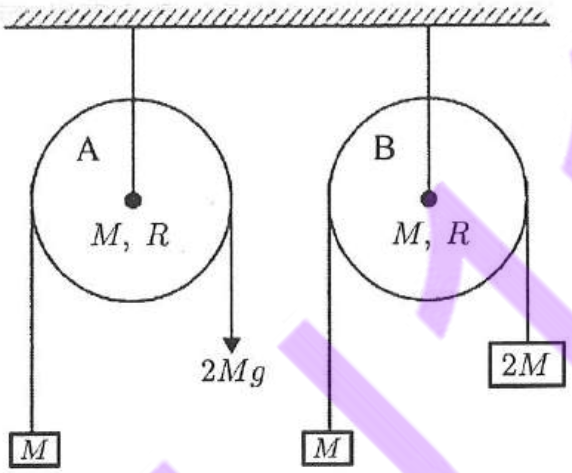
(B) The sign of the charge carriers

(C) Electron's charge to mass ratio

(D) The type (N- or P-type) of semiconductor

(E) The density of free electrons inside metal

10. A cord is wrapped on a pulley (treated as a uniform solid disk) of mass M and radius R as shown in the figure. To one end of the cord, a block of mass M is connected and to other end in (A) a force of $2Mg$ and in (B) a block of mass $2M$. The cord does not slip relative to the pulley as the block falls. Let angular acceleration of the disk in A and B be α_A and α_B, respectively. So,



(A) $\alpha_A : \alpha_B = 3:1$

(B) $\alpha_A : \alpha_B = 1:1$

(C) $\alpha_A : \alpha_B = 2:1$

(D) $\alpha_A : \alpha_B = 5:2$

(E) $\alpha_A : \alpha_B = 7:3$

11. The average power transferring along the string can be written as $P = \mu v^a \omega^b A^c / 2$, where μ is the mass density of the string, ω the angular frequency of the string wave, A the amplitude, v the speed. What is the value of $a+b+c$?

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

12. A shear force of 600 N is applied to one face of an alloy cube with sides of 20 cm while the opposite face is held fixed in place. What is the resulting displacement of the face? (The shear modulus for this alloy is 2.50×10^{10} N/m^2)?

(A) 12×10^{-8} m

(B) 9.0×10^{-8} m

(C) 6.0×10^{-8} m

(D) 3.0×10^{-8} m

(E) None of the above

13. Consider two different diatomic ideal gases (N_1 and N_2) kept in two separate volumes (V_1 and V_2) at the same temperature T and both volumes thermally isolated to the environment. What is the change of entropy in the mixing process?

(A) $\frac{\Delta S_{total}}{k_B} = N_1 \ln\left(\frac{V_1+V_2}{V_2}\right) + N_2 \ln\left(\frac{V_1+V_2}{V_1}\right)$

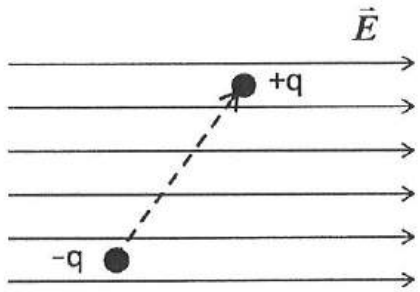
(B) $\frac{\Delta S_{total}}{k_B} = N_1 \ln\left(\frac{V_1+V_2}{V_1}\right) + N_2 \ln\left(\frac{V_1+V_2}{V_2}\right)$

(C) $\frac{\Delta S_{total}}{k_B} = \frac{N_1+N_2}{2}\left[\ln\left(\frac{V_1+V_2}{V_1}\right) + \ln\left(\frac{V_1+V_2}{V_2}\right)\right]$

(D) $\frac{\Delta S_{total}}{k_B} = \sqrt{N_1 N_2}\ln\frac{(V_1+V_2)^2}{V_1 V_2}$

(E) None of the above.

14. There is an electric dipole in an external uniform E-field, as shown below.



Examine the following expression for the work done on the dipole:

$$W = \int_{\pi/2}^{\theta} \vec{\tau} \cdot d\vec{\theta} = -\int_{\pi/2}^{\theta} \tau d\theta = pE\cos\theta = \vec{p} \cdot \vec{E} = -U(\theta)$$

where $U(\theta) = 0$ as $\theta = \pi/2$.

(A) This expression is correct

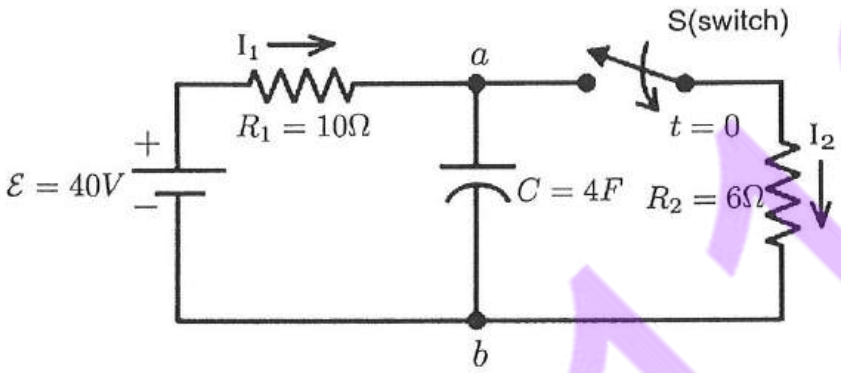
(B) The negative sign after the second equal sign is wrong

(C) The negative sign after the last equal sign is wrong

(D) Both negative signs should be removed

(E) The dipole has a maximum potential energy when it is parallel to $\vec{E}$ (namely, $\theta = 0$)

15. Referring to the DC circuit shown below with the capacitor C been fully charged, the switch S is connected "ON" at $t = 0$ so that the crrent I_2 starts to flow through the resistor R_2. How does the current function $I_2(t)$ depend on time?



(A) $i_2(t) = \frac{\mathcal{E}}{R_1}\left(1+e^{-t/\tau}\right)$, where $\tau = R_2C$

(B) $i_2(t) = \frac{\mathcal{E}}{R_1+R_2}\left(1+e^{-t/\tau}\right)$, where $\tau = R_2C$

(C) $i_2(t) = \frac{\mathcal{E}}{R_1+R_2}\left(1+\frac{R_1}{R_2}e^{-t/\tau}\right)$, where $\tau = \frac{R_1R_2}{R_1+R_2}C$

(D) $i_2(t) = \frac{\mathcal{E}}{R_1+R_2}\left(1+\frac{R_2}{R_1}e^{-t/\tau}\right)$, where $\tau = \frac{R_1R_2}{R_1+R_2}C$

(E) $i_2(t) = \frac{\mathcal{E}}{R_1+R_2}\left(1+\frac{R_2}{R_1}e^{-t/\tau}\right)$, where $\tau = (R_1+R_2)C$

16. Two short uniform cylindrical-shaped magnetic bars, with identical length L and radius R, are lined up through their cylindrical axis and separated by a distance x with respect to the center of mass of each one. Considering the pure dipole approximation, $x >> L > R$, the magnetic force between two magnetic dipoles are proportional to the p-th power of the distance x. What is the value of p?

(A) −2

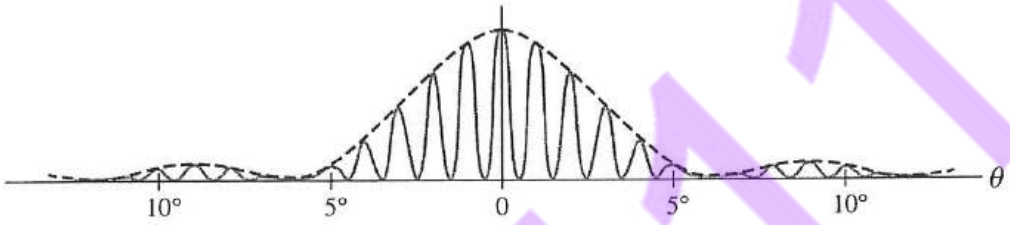
(B) −3

(C) −4

(D) −5

(E) −6

17. The double-slit experiment also exhibits diffraction effects, as the slits have a finite width D. According to the calculated intensity $I_\theta = I(\theta)$ of interference pattern, as shown below, with the parameters: $d = pD = q\lambda$, where d is the distance between slits and λ is the wavelength of light. Determine what the value of p/q is.



Intensity, I_θ vs. θ

(A) 1/12

(B) 1/11

(C) 1/10

(D) 1

(E) 11

18. A particle of mass 1 kg is confined to move in the one-dimensional region $x > 0$. It is subject to a potential energy function $U(x) = \frac{1}{x} + \frac{x^2}{2}$ (Joules). If the particle is initially placed at its mechanical equilibrium position and then given a small displacement, what is the period of its subsequent oscillations?

(A) $2\pi\sqrt{1/3}$ (s)

(B) $2\pi\sqrt{1/2}$ (s)

(C) $2\pi\sqrt{2}$ (s)

(D) $2\pi\sqrt{3}$ (s)

(E) None of the above

19. Consider a uniform metal bar with both ends in contact with thermal reservoirs, one at a fixed high temperature (T_h) and the other at a fixed low temperature (T_c). After reaching thermal equilibrium, which of the following statements is false?

(A) The temperature gradient is a constant across the metal bar.

(B) The change in entropy of the high-temperature reservoir is negative.

(C) If the length of the metal bar increases, the heat flux does not change.

(D) The heat flux is uniform throughout the metal bar.

(E) None of the above is false.

20. Beat is an interference phenomenon when two waves of slightly different frequencies are superposed. How does the beat frequency change when both sound sources (of slightly different frequencies) move relative to the stationary listener?

(A) It does not change if both sound sources approach the listener at the same speed.

(B) It increases if both sound sources approach the listener at the same speed.

(C) It decreases if one sound source approaches and the other moves away from the listener at the same speed.

(D) It increases if one sound source approaches and the other moves away from the listener at the same speed.

(E) None of the above is false.

21. John skates on the ground subject to a friction force. For a stationary observer *A* relative to the ground, he observes that John has an initial velocity +5 m/s in the *x*-direction and finally stops after traveling a distance of 12.5 m. This phenomenon is observed by the other observer *B*, who is riding a bus that moves at a constant speed of +2 m/s in the *x*-direction relative to the stationary ground. Therefore, the observer *B* sees that John's velocity changes from +3 m/s to -2 m/s in the *x*-direction. Consider the kinematic equation that $v_f^2 = v_i^2 + 2a\Delta x$, where Δx is the distance travelled; which of the following statements is true?

(A) From the observer *B*'s point of view, since $v_f^2 - v_i^2 \neq 5^2 - 0^2$, *B* would measure a different deceleration than what *A* would have measured.

(B) The kinematic equation only works in *A*'s reference frame.

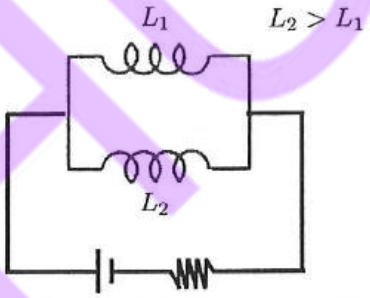
(C) The kinematic equation only works in *B*'s reference frame.

(D) The inconsistency of the kinematic equation can be amended by the special relativity.

(E) None of the above is true.

22. For a 2D monatomic ideal gas, which of the following statements is true?
(A) The probability density function of finding particles of the velocity of $\vec{v} = v\hat{x}$ is not only linearly proportional to the Boltzmann factor $e^{mv^2/2k_BT}$ but also linearly proportional to v^2.
(B) The probability density function of finding particles of the speed of v is only linearly proportional to the Boltzmann factor $e^{mv^2/2k_BT}$.
(C) The probability density function of finding particles of the speed v is not only linearly proportional to the Boltzmann factor $e^{mv^2/2k_BT}$ but also linearly proportional to v.
(D) The probability density function of finding particles of the speed of v is not only linearly proportional to the Boltzmann factor $e^{mv^2/2k_BT}$ but also linearly proportional to v^2.
(E) None of the above is true.

23. For two inductors connected in parallel, see the figure below; which of the following statements is true?



(A) The effective inductance of the two inductors is smaller than that of both L_1 and L_2.
(B) The effective inductance of the two inductors is larger than that of both L_1 and L_2.
(C) After a sufficiently long time, the voltage across the parallel inductors reaches a maximum steady value.
(D) After a sufficiently long time, the voltage across L_2 is larger than that across L_1.
(E) None of the above.

24. For a classical electromagnetic plane wave travelling in a vacuum, which of the following statements is true?

(A) The magnetic and electric fields are perpendicular to each other, and there is a phase difference of $\pi/2$ between them.

(B) The average power delivered by the EM wave increases with the frequency of the EM wave.

(C) The traveling direction of the EM wave can be in either the direction of $\hat{E} \times \hat{B}$ or $-\hat{E} \times \hat{B}$, where $\hat{E}$ and $\hat{B}$ are the direction of the electric field and the magnetic field, respectively.

(D) The power of the EM wave decays as it propagates away from its source.

(E) None of the above.

25. Which statement correctly describes the Bohr model of the hydrogen atom?

(A) It assumes that electrons surround the hydrogen nucleus as continuous waves.

(B) It successfully explains the fine structure of the hydrogen spectrum.

(C) It assumes that the electron moves in a circular path, radiating the electromagnetic wave.

(D) It assumes that the angular momentum of the electron is quantized.

(E) None of the above.

第 26 題至第 40 題每題 5 分，答錯倒扣 1.25 分**，未作答，不給分亦不扣分**

26. Suppose A is a 4×4 real matrix and v_1, v_2, v_3, v_4 are four linearly independent vectors in R^4. If $Av_1 = v_1 + v_2$, $Av_2 = v_2 + v_3$, $Av_3 = v_3 + v_4$, $Av_4 = v_1 + v_4$, then how many real eigenvalues does A have?

(A) 0

(B) 1

(C) 2

(D) 3

(E) 4

27. Suppose A is a 2×3 real matrix and B is a 3×2 real matrix. If $AB=\begin{bmatrix}1&0\\0&1\end{bmatrix}$, then which of the following matrix can be the product of BA?

(A) $\begin{bmatrix}0&0&0\\0&0&0\\0&0&0\end{bmatrix}$

(B) $\begin{bmatrix}1&0&0\\0&0&0\\0&0&0\end{bmatrix}$

(C) $\begin{bmatrix}0&1&0\\0&0&1\\0&0&0\end{bmatrix}$

(D) $\begin{bmatrix}1&0&0\\0&0&0\\0&0&1\end{bmatrix}$

(E) $\begin{bmatrix}1&0&0\\0&1&0\\0&0&1\end{bmatrix}$

28. Suppose $A=\begin{bmatrix} 3 & 2 \\ 2 & 3 \\ 2 & -2 \end{bmatrix}$ and $x=\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ with $x_1, x_2 \in R$. Let $\|\cdot\|$ denote the standard vector norm in R^2 and R^3. What is the smallest possible value for $\|Ax\|$ if $\|x\|=1$?

(A) $\sqrt{6}$

(B) $2\sqrt{2}$

(C) 3

(D) 4

(E) $\sqrt{17}$

29. Suppose $A=\begin{bmatrix} 1 & -1 & 2 \\ 1 & 1 & 0 \end{bmatrix}$ and $b=\begin{bmatrix} 3 \\ -1 \end{bmatrix}$. Let $\|\cdot\|$ denote the standard vector norm in R^3. What is the smallest possible value for $\|x\|$ if $Ax=b$?

(A) 1

(B) $\sqrt{2}$

(C) $\sqrt{3}$

(D) 2

(E) $\sqrt{5}$

30. Suppose A is a 3×3 invertible matrix and I_3 is the 3×3 identity matrix. The followings are 5 statements about A that may or may not be true.

(1) If $p(x)$ is the characteristic polynomial of A, then the constant term of $p(x)$ cannot be 0.

(2) If a 3×3 matrix B satisfies $AB+BA=0$, then B is singular.

(3) For any 3×5 matrix C, $rank(AC)=rank(C)$.

(4) If a 3×3 matrix D is diagonalizable, then AD is also diagonalizable.

(5) If E is a 3×3 matrix and AE is singular, then E is also singular.

Which of the above statements about A is False?

(A) (1)

(B) (2)

(C) (3)

(D) (4)

(E) (5)

31. If $\|\mathbf{u}\| = 8$ and $\|\mathbf{v}\| = 3$, then what are the largest possible values of the inner product $\langle \mathbf{u}+\mathbf{v}, \mathbf{v}\rangle$?

(A) 24

(B) 12

(C) 15

(D) 33

(E) 45

32. Consider the system of linear equations:

$$x + 7y - 6z = 6$$
$$2x + 11y - 8z = 7$$
$$x + 10y + Cz = 10$$

For what value of C will the system be singular?

(A) -10

(B) -6

(C) -3

(D) 4

(E) 10

33. Given the row-reduced echelon form $R = \begin{bmatrix} 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 1 \end{bmatrix}$ of a matrix A.

What is the closest vector to $\mathbf{b} = [0, 3, 0, 1]^T$ in the row space of A?

(A) $[1, 1, 2, 0]^T$

(B) $[0, -2, -1, 1]^T$

(C) $[-1, 2, 0, -1]^T$

(D) $[-1, 2, 1, 0]^T$

(E) $[1, 1, 3, 1]^T$

34. Let $A=\begin{pmatrix}1 & -4 & 4\\ 0 & 1 & -1\\ 1 & -2 & 1\end{pmatrix}$, which of the following statement is incorrect?

(A) The rank of A is 3.

(B) The inverse matrix is $A^{-1}=\begin{pmatrix}1 & 4 & 0\\ 1 & 3 & -1\\ 1 & 2 & -1\end{pmatrix}$.

(C) If we define the characteristic polynomial of A is $f(t)=\det(A-tI_n)$, then $f(t)=-t^3+3t^2+3t-1$.

(D) One of the eigenvalues is –1 and the corresponding eigenvector is $(-2, 1, 2)^T$.

(E) The matrix cannot be diagonalized over the real field.

35. An $n \times n$ skew-symmetric matrix A is defined as $A^t = -A$. Please find the dimension of this matrix.

(A) n

(B) n^2

(C) $n(n+1)/2$

(D) $n(n-1)/2$

(E) $n+1$

36. A vector space is spanned by $\{1, \cos(t), \sin(t)\}$ for $-\pi \le t \le \pi$. If a vector: $v = a \cdot 1 + b \cdot \sin(t) + c \cdot \cos(t)$ is the closest vector in this vector space to a continuous function: $f(t) = t$ for $-\pi \le t \le \pi$, what is this closest v? The inner product of two continuous functions: f and g within $[a, b]$ is defined by $\langle f, g \rangle = \int_a^b f \cdot \bar{g} dt$. You may need the following integral: $\int t \cdot e^{it} dt = -i(t+i)e^{it} + C$.

(A) $v = 1 + 2\sin(t) - 2\cos(t)$

(B) $v = 1 - 2\cos(t)$

(C) $v = 2\sin(t)$

(D) $v = 1 + 2\sin(t)$

(E) $v = -2\cos(t)$

37. A quadratic equation is described as: $x^2 + 8xy + 7y^2 = 225$. Which of the following statement is incorrect?

(A) The curve is centered at the origin

(B) This quadratic curve is an ellipse

(C) One of the principal axes is $\frac{1}{\sqrt{5}}(2x - y)$

(D) The other principal axis is $\frac{1}{\sqrt{5}}(x + 2y)$

(E) The shortest distance from this quadratic curve to the origin is 5

38. Which of the following statements is true?

(A) Let A be an arbitrary matrix of size $m \times n$. If $m > n$, then $\text{rank}(A) < \text{rank}(A^t)$.

(B) Let A be an arbitrary matrix of size $m \times n$. If $m > n$, then $\text{rank}(A) > \text{rank}(A^t)$.

(C) If W_1, W_2 are two subspaces of V, then the union $W_1 \cup W_2$ is also a subspace of V.

(D) Let W be a subspace of a vector space V. Then, $\dim(W) \le \dim(V)$.

(E) Let A be a square matrix, k be a constant. Then, $\det(kA) = k\det(A)$.

39. Consider the matrix $A = \begin{pmatrix} 3 & 2 \\ 2 & 6 \end{pmatrix}$. How many different matrices $B \in \mathbb{R}^{2\times 2}$ are there such that $B^2 = A$?

(A) 0

(B) 1

(C) 2

(D) 4

(E) 16

40. Consider the Fibonacci series $a_0 = 1$, $a_1 = 2$, and $a_n = a_{n-1} + a_{n-2}$ for any $n \geq 2$. Therefore, we have $\{a_n\} = \{1,2,3,5,8, \dots\}$. The general expression for a_n as a function of n can be found via the following method; first, define $A = \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix}$, and define the state vector $v_n = \begin{pmatrix} a_n \\ a_{n+1} \end{pmatrix}$. Thus, we have the initial condition $v_0 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$, and the relation $v_{n+1} = Av_n$. The following general expression can be derived: $a_n = b_1\lambda_1^n + b_2\lambda_2^n$, where λ_1 and λ_2 are the eigenvalues of A. How many of the following statements are true?

I. $a_n \in \mathbb{N}$ for all $n \geq 0$.

II. $\lambda_1\lambda_2 = -1$.

III. $\lim_{n\to\infty} \frac{a_{n+1}}{a_n} = \frac{1+\sqrt{5}}{2}$.

IV. The eigenvalues of A^n are λ_1^n and λ_2^n.

(A) 0

(B) 1

(C) 2

(D) 3

(E) 4

國立清華大學 113 學年度學士後醫學系考試 各科試題參考答案

科目名稱：【0101 英文】

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
答案	D	A	B	E	C	B	B	D	A	A	A	C	C	B	B
題號	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
答案	D	D	B	D	D	E	A	C	B	B	B	E	C	B	D
題號	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
答案	C	E	D	B	B	A	D	E	B	C	E	A	D	E	D
題號	46	47	48	49	50										
答案	D	B	A	E	E										

科目名稱：【0102 生物與生化】

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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題號	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
答案	A	E	C	D	C	A	D	A	B	D	B	C	B	E	C
題號	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
答案	A	A	B	D	C	C	D	A	D	D	A	E	B	D	A
題號	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
答案	D	C	A	B	D	C	A	C	E	D	C	A	A	C	D

科目名稱：【0103 化學與物理】

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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答案	B	C	B	D	D	E	E	D	D	C	B	B	E	B	A
題號	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
答案	C	A	A	E	E	E	D	E	D	D	D	A	B	D	E

科目名稱：【0104 資訊科學】

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
答案	B	E	A	E	E	C	C	D	C	E	E	A	B	A	C
題號	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
答案	C	C	A	C	B	E	C	A	E	D	C	D	C	B	D
題號	31	32	33	34	35	36	37	38	39	40					
答案	D	A	D	E	D	C	B	D	D	E					