國立中山大學115學年度
碩士班考試入學招生考試試題

科目名稱：科技英文【精準所碩士班、生藥所碩士班、生醫所碩士班、醫科所碩士班甲組、乙組、生醫科學與工程領域聯合碩士班】

—作答注意事項—

考試時間：100分鐘

- **考試開始鈴響前不得翻閱試題，並不得書寫、劃記、作答。**請先檢查答案卷（卡）之應考證號碼、桌角號碼、應試科目是否正確，如有不同立即請監試人員處理。
- **答案卷限用藍、黑色筆(含鉛筆)書寫、繪圖或標示**，可攜帶橡皮擦、無色透明無文字墊板、尺規、修正液（帶）、手錶(未附計算器者)。每人每節限使用一份答案卷，請衡酌作答。
- 答案卡請以2B鉛筆劃記，不可使用修正液（帶）塗改，未使用2B鉛筆、劃記太輕或污損致光學閱讀機無法辨識答案者，後果由考生自負。
- 答案卷（卡）應保持清潔完整，不得折疊、破壞或塗改應考證號碼及條碼，亦不得書寫考生姓名、應考證號碼或與答案無關之任何文字或符號。
- 可否使用計算機請依試題資訊內標註為準，如「可以」使用，廠牌、功能不拘，唯不得攜帶書籍、紙張（應考證不得做計算紙書寫）、具有通訊、記憶、傳輸或收發等功能之相關電子產品或其他有礙試場安寧、考試公平之各類器材入場。
- **試題及答案卷（卡）請務必繳回，未繳回者該科成績以零分計算。**
- **試題採雙面列印，考生應注意試題頁數確實作答。**
- **違規者依本校招生考試試場規則及違規處理辦法處理。**

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※本科目依簡章規定「不可以」使用計算機(選擇題)

The following are all single-choice questions (2.5 points/question)

1. The "Rule of Five" proposed by Lipinski is primarily used to:
A. Predict drug metabolism pathways
B. Assess potential for oral bioavailability
C. Estimate protein binding
D. Determine parenteral compatibility

2. The main purpose of a randomized controlled trial is to:
A. Ensure blinding of sponsors
B. Eliminate all confounding variables
C. Reduce selection bias between treatment groups
D. Guarantee statistical significance

3. David felt disappointed when he found out that he could not choose his study partners,but would be _____ placed in a study group.
A. eligibly
B. randomly
C. apparently
D. consequently

4. Quaternary structure arises when:
A. One polypeptide alternates between two conformations
B. A chaperone forms a covalent complex with a substrate
C. A protein binds DNA irreversibly
D. Multiple independently folded subunits associate via noncovalent interactions

5. As blood supplies have fallen to a critically low level, many hospitals are making an _____ for the public to donate blood.
A. appeal
B. approach
C. operation
D. observation

6. In receptor theory, a full agonist is best described as a ligand that:
A. Binds but produces no response
B. Produces a maximal response and has high efficacy
C. Decreases the maximal response of another agonist
D. Produces a partial response even at full receptor occupancy

7. In medicinal chemistry, a "bioisostere" is:
A. A group that increases molecular weight without changing activity
B. A functional group replacement that preserves biological activity
C. A fragment used only to increase lipophilicity
D. A group that always decreases toxicity

8. The "orphan drug" designation is granted to drugs that:
A. Are off-patent and can be generically produced
B. Have no identified molecular target

C. Treat rare diseases affecting a small patient population
D. Are developed without any sponsor

9. In mRNA vaccines, the mRNA is usually delivered inside:
A. Naked DNA molecules
B. Viral capsids
C. Lipid nanoparticles (LNPs)
D. Protein shells only

10. Which of the following best describes a *biologic* drug?
A. A low-molecular-weight compound synthesized chemically
B. A product derived from living organisms, such as monoclonal antibodies
C. A small organic molecule with high lipophilicity
D. An inorganic salt with high solubility

11. The main purpose of a Phase II clinical trial is to:
A. Assess long-term safety in a large population
B. Evaluate preliminary efficacy and dose-response in patients
C. Compare cost-effectiveness with generic drugs
D. Conduct post-marketing surveillance

12. The chromatin can exist in different structural states. When chromatin is highly compacted and generally does not allow transcription to occur, what is this form of chromatin called?
A. Euchromatin
B. Telomere
C. Nucleosome
D. Heterochromatin

13. Which regulatory document is required before initiating clinical trials in humans in many jurisdictions (e.g., USA)?
A. New Drug Application (NDA)
B. Investigational New Drug (IND) application
C. Marketing Authorization Application (MAA)
D. Orphan Drug Designation

14. In drug repurposing (drug repositioning), the main objective is to:
A. Design an entirely new drug target
B. Modify the chemical structure to extend patent life only
C. Identify new therapeutic indications for an existing drug
D. Eliminate the need for any clinical trials

15. In some countries, military service is _____ for men only; women do not have to serve in the military.
A. forceful
B. realistic
C. compulsory
D. distinctive

16. Which statement best describes the mechanism of GLP-1 receptor–based drugs (often incorrectly called "GLP-1 inhibitors") such as liraglutide and semaglutide in the treatment of type 2 diabetes?

A. They directly inhibit pancreatic β-cell insulin synthesis, reducing glucose variability.
B. They act as agonists at the GLP-1 receptor, enhancing glucose-dependent insulin secretion and suppressing glucagon.
C. They irreversibly inhibit DPP-4, preventing degradation of endogenous GLP-1.
D. They block intestinal glucose transporters, reducing carbohydrate absorption.

17. Located at the center of the city, the business hotel _____ not only good service but also convenient public transport.
A. proposes
B. contains
C. promises
D. confirms

18. During translation, the ribosome scans the mRNA to find the start site for protein synthesis. Which codon generally serves as the universal start codon for translation in eukaryotes and prokaryotes?
A. AUG
B. UAA
C. UAG
D. UGA

19. Which modification at the 5' end of eukaryotic mRNA protects it from exonuclease degradation?
A. Polyadenylation
B. RNA splicing
C. 7-methylguanosine capping
D. Uridylation E. Dephosphorylation

20. The heat-stable enzyme in PCR is:
A. RNA polymerase
B. Taq polymerase
C. DNA ligase
D. Primase

21. The roasting heat and high _____ made me feel hot and sticky, no matter what I did to cool off.
A. density
B. humidity
C. circulation
D. atmosphere

22. Which statement best defines a protein's primary structure?
A. Repeating local hydrogen-bonded motifs like α-helices and β-sheets
B. The linear sequence of covalently bonded amino acids encoded by a gene
C. The overall 3D fold formed by packing secondary structures
D. The assembly of multiple folded subunits into a complex

23. The genetic code is described as "degenerate" because:
A. Some codons encode multiple amino acids
B. Codons overlap
C. Stop codons are absent
D. Multiple codons can encode the same amino acid

24. Small interfering RNAs (siRNAs) and microRNAs (miRNAs) are two classes of small regulatory RNAs. Which of the following is a shared functional feature of both siRNA and miRNA?
A. Originate from proteins
B. Silence target mRNAs
C. Promote transcription
D. Are produced by DNA polymerase

25. Enzymes accelerate reactions mainly by:
A. Increasing the free energy (ΔG°) of products
B. Raising activation energy to avoid side reactions
C. Consuming ATP in every reaction
D. Lowering activation energy and stabilizing transition-state intermediates

26. The vacuum cleaner is not working. Let's send it back to the _____ to have it inspected and repaired.
A. lecturer
B. publisher
C. researcher
D. manufacturer

27. Which of the following best describes a covalent bond?
A. An attraction between oppositely charged ions
B. A sharing of electron pairs between atoms
C. A transient interaction between dipoles
D. A hydrophobic exclusion mechanism

28. Loss-of-function mutations in BRCA1/2 most strongly predispose individuals to which condition?
A. Neurodegenerative disease
B. Autoimmune disorders
C. Breast and ovarian cancers
D. Cardiovascular disease
E. Metabolic syndrome

29. The townspeople built a _____ in memory of the brave teacher who sacrificed her life to save her students from a burning bus.
A. monument
B. refugee
C. souvenir
D. firecracker

30. Which event is considered a hallmark of apoptosis but NOT necrosis?
A. Cell swelling
B. Plasma membrane rupture
C. DNA fragmentation into nucleosomal units
D. ATP depletion
E. Loss of ion gradients

31. The candy can no longer be sold because it was found to contain artificial ingredients far beyond the _____ level.

A. abundant
B. immense
C. permissible
D. descriptive

32. Which cellular compartment has the lowest pH under normal physiological conditions?
A. Cytosol
B. Nucleus
C. Mitochondrial matrix
D. Lysosome
E. Endoplasmic reticulum

33. The police officer showed us pictures of drunk driving accidents to highlight the importance of staying _____ on the road.
A. sober
B. majestic
C. vigorous
D. noticeable

34. Which enzyme removes RNA primers from Okazaki fragments during eukaryotic DNA replication?
A. DNA ligase I
B. RNase H
C. DNA polymerase α
D. DNA helicase
E. DNA primase.

35. The claim that eating chocolate can prevent heart disease is _____ because there is not enough scientific evidence to support it.
A. creative
B. disputable
C. circular
D. magnificent

36. Which organelle is directly involved in the detoxification of hydrogen peroxide?
A. Lysosome
B. Peroxisome
C. Golgi apparatus
D. Endoplasmic reticulum
E. Mitochondrion

37. Which metabolic pathway occurs exclusively in the mitochondrial matrix?
A. Glycolysis
B. Pentose phosphate pathway
C. Citric acid cycle
D. Fatty acid synthesis
E. Gluconeogenesis

38. Which chromatin state is most strongly associated with active gene transcription?
A. Constitutive heterochromatin

B. Facultative heterochromatin
C. Euchromatin
D. Barr body
E. Centromeric chromatin

39. Which amino acid is least likely to be a direct target of reversible post-translational modifications involved in signaling pathways?
A. Serine
B. Threonine
C. Tyrosine
D. Lysine
E. Glycine

40. Which protein acts as a key executioner protease during apoptosis?
A. Bcl-2
B. Cytochrome c
C. Caspase-3
D. p21
E. LC3