

I. Please choose the fittest answer to complete the sentence in each question. (60%)

1. () Do you think ____ is easier than to act?
(A) talking (B) about to talk (C) of taking (D) to talk
2. () I am not sure of ____ the table.
(A) where putting (B) where being put (C) where to put (D) where to be put
3. () Here almost everyone has a lap-top, ____ a mobile.
(A) to say nothing of (B) not to speak (C) to speak nothing of (D) no more to say
4. () Maria studies harder than ____ at that corner.
(A) the boy who seated (B) the boy is seated (C) is the boy seated (D) does the boy seat
5. () They seemed ____ for hours when we met them yesterday.
(A) that they had walked (B) that they walked (C) to have walked (D) as if had walked
6. () He is ____ young ____ school.
(A) too, for go to (B) so, to go to (C) too, to go to (D) too, to going to
7. () He is given to pleasure = He does nothing but ____ pleasure.
(A) pursue (B) to pursue (C) deny (D) denying
8. () All the spectators desired nothing but ____ an exciting game.
(A) there being (B) there be (C) there is (D) there to be
9. () Flattery cannot help ____ your end.
(A) to gaining (B) gain (C) gaining (D) for gaining
10. () This plan is sure ____.
(A) to fail (B) of failing (C) of failure (D) to be failed
11. () Any ____ person may apply for this position.
(A) interest (B) interesting (C) interested (D) interests
12. () I am tired of eating ____.
(A) freezing meat (B) boiling egg (C) can fish (D) fried potatoes
13. () The watch ____ to May is very expensive.
(A) which is belonged (B) belonging (C) belonged (D) belongs
14. () There stood a lime tree ____ with apples fresh and wet with dew.
(A) to load (B) loading (C) being loaded (D) loaded
15. () They returned ____.
(A) to defeat (B) to defeating (C) defeating (D) defeated
16. () The accused ____ of trespassing on privacy.
(A) stood accused (B) to stand accused (C) stood accusing (D) of standing accusing
17. () She seemed ____ at my question.
(A) annoy (B) annoying (C) to annoy (D) annoyed
18. () I saw the key ____ here this morning.
(A) laying (B) laid (C) lain (D) having laid
19. () As he entered the room, he found many books ____ scattered on the floor.
(A) laying (B) to lay (C) lying (D) lie
20. () A thief slipped in ____ and caught on the very spot.
(A) observing (B) observed (C) unobserving (D) unobserved
21. () ____ being a fine day last Sunday, we went mountain climbing.
(A) For (B) It (C) As (D) The weather

22. () Everyone ____, the dinner began.
(A) was seated (B) seated (C) were seated (D) sat
23. () Ginna plays tennis so well that, ____ the proper training, she may well become a creditable professional.
(A) give (B) she is given (C) giving (D) given
24. () My shoes ____ worn out, I had to buy a new pair.
(A) was (B) has been (C) having (D) being
25. () As a desert is like a sea, ____ a camel like a ship.
(a) and the same as (B) so does (C) so that (D) so is
26. () I know a better doctor than does Sam.
(A) The doctor I know is better than Sam
(B) Sam knows a doctor who is better than I am
(C) Sam knows a doctor who is better than himself
(D) The doctor I know is better than the doctor Sam knows
27. () We could hardly help our tears.
(A) If we could help it, we would not burst out laughing
(B) We were not in a position to shed tears
(C) We shed tears in spite of ourselves
(D) We helped ourselves to tears
28. () He cannot speak English, not to mention German.
(A) He can speak either English or German
(B) He can speak neither English nor German
(C) He can speak both English and German
(D) He can speak not English but German
29. () She is a graduate student, but her scholarship is not good enough, not to speak of practical experience.
(A) For all her scanty scholarship, she is a good mixer
(B) She is fresh from school
(C) Her practical experience is nothing to speak of
(D) We do not have the slightest idea of her practical experience
30. () Our business is too great a success not to excite envy in the rivals.
(A) The rivals will be pleased to hear our exciting success
(B) Our successful business will leave the rivals cold
(C) The rivals will think lightly of our success in business
(D) The rivals are sure to be jealous of our success

II. Please choose the most appropriate answer from the word bank for each blank in the essay.
(20%)

[Word Bank .]

(1) a very unequal business (2) brain drain (3) ethical recruitment policies (4) global health budget (5) key (6) lack (7) shortages (8) stark (9) struggling to cope (10) train more staff

The statistics in the World Health report are (31). The continents of North and South America have just ten per cent of the world's burden of disease but thirty-seven per cent of the world's health workers, and spend over fifty per cent of the total (32). The continent of Africa has twenty-four per cent of the world's disease, just three per cent of the world's health workers and less than one per cent of the budget.

Access to health care is (33). Of the fifty-seven countries which (34) health workers, thirty-six of them are in sub-Saharan Africa, the very same countries which are (35) with the AIDS epidemic.

The World Health Organization says the (36) are undermining not just the battle against deadly diseases like AIDS, tuberculosis and malaria; they're affecting childhood vaccination campaigns and basic care for pregnant women.

The reasons for the shortages are many, but money is (37). Rich countries need more doctors and nurses too, and salaries are higher than in Africa. The WHO says developing countries are suffering a (38) of health professionals.

The report calls for (39) for migrant health workers and international investment to help poor countries (40) because at the moment the world is short of four-million health workers and one-point-three-billion people lack even the most basic health care.

III. Composition: write about the work of the world, the people who do it, and things that are worth doing well (20%).

1. Which of the following statement concerning the cardiovascular effects of i.v. infusion of epinephrine is correct?
(a. blood flow is decreased, b. diastolic BP is increased, c. heart rate is decreased, d. total peripheral resistance is decreased)
2. Which of the following drug is a α_1 -selective agonist and is also used as a nasal decongestant and as a mydriatic?
(a. Phenylephrine, b. Epinephrine, c. Ephedrine, d. Methyldopa)
3. Which of the following sympathomimetic drug is widely used in the treatment of hypertension and its major adverse effects are dry mouth and sedation?
(a. Pemoline, b. Dobutamine, c. Metaproterenol, d. Clonidine)
4. Which of the following drug is the β_2 -adrenergic agonist that is currently approved in the United States for use to delay or prevent premature parturition?
(a. Salbutamol, b. Atenolol, c. Ritodrine, d. Metaproterenol)
5. All of the following drugs can be used in open-angle glaucoma EXCEPT
(a. Apraclonidine, b. Atropine, c. Acetazolamide, d. Pilocarpine)
6. Which of the following β -adrenoceptor antagonist may delay recovery from insulin-induced hypoglycemia in diabetics?
(a. Atenolol, b. Acebutolol, c. Metoprolol, d. Propranolol)
7. Which of the following sympathomimetic agent is effective in the treatment of attention-deficit hyperactivity disorder (ADHD)?
(a. Metaproterenol, b. Phenylephrine, c. Methylphenidate, d. Phenoxybenzamine)
8. Which of the following α -adrenergic antagonist causes the so-called first-dose phenomenon after oral an initial dose?
(a. Phenoxybenzamine, b. Prazosin, c. Tolazoline, d. Phentolamine)
9. Which of the following drug is β_2 selective agonist that is typically administered by inhalation for asthma management?
(a. Epinephrine, b. Cromolyn sodium, c. Terbutaline, d. Isoproterenol)
10. Which of the following cholinceptor-activating agent is of value in the treatment of postoperative abdominal distension, gastric atony or retension and gastroesophageal reflux disease?
(a. Acetylcholine, b. Methacholine, c. Carbachol, d. Bethanechol)
11. Which of the following drug can NOT be used in urinary obstruction due to prostatic hypertrophy?
(a. Prazosin, b. Methylephedrine, c. Terazosin, d. Phenoxybenzamine)
12. Which of the following drug is the standard cholinergic agent for initial treatment of open-angle glaucoma?
(a. Pilocarpine, b. Methacholine, c. Carbachol, d. Bethanechol)
13. Which of the following statement about esmolol is **incorrect**?
(a. is a selective β_1 antagonist, b. contains an ester linkage, c. has a half-life of about 8 minutes, d. has a membrane-stabilizing action)
14. Which of the following drug can be useful in the treatment of bronchospasm?
(a. Carbachol, b. Scopolamine, c. Ipratropium, d. Benztropine)
15. Which of the following drug is approved by the FDA in the United States for clinical use in mild to moderate Alzheimer's dementias?
(a. Methacholine, b. Tacrine, c. Echothiophate, d. Ambenonium)
16. Which of the following drug is useful in the treatment of refractory edema and has a complication of ototoxicity?
(a. Thiazides b. Acetazolamide. c. Spironolactone. d. Furosemide)

17. Which of the following diuretic drug would be most useful in a patient with cerebral edema?
(a. Acetazolamide, b. Mannitol, c. Bumetanide, d. Chlorothiazide)
18. Which of the following transdermal preparation used for motion sickness has been reported to cause toxic psychoses, especially in children and in the elderly?
(a. Propantheline, b. Scopolamine, c. Benztropine, d. Trihexyphenidyl)
19. Which of the following drug is the best agent for the diagnosis of myasthenia gravis?
(a. Atropine, b. Physostigmine, c. Edrophonium, d. Echothiophate)
20. Which of the following drug can be used in hirsutism?
(a. Spironolactone, b. Amiloride, c. Minoxidil, d. Finasteride)
21. Which of the following drug is effective in terminating paroxysmal supraventricular tachycardia (PSVT)?
(a. Digitalis, b. Propranolol, c. Adenosine, d. Flecainide)
22. Which of the following antiarrhythmic drug may cause lupus syndrome after long-term therapy?
(a. Procainamide, b. Lidocaine, c. Verapamil, d. Bretylium)
23. Which of the following diuretic drug would be most useful in the management of severe hypercalcemia?
(a. Thiazides, b. Acetazolamide, c. Furosemide, d. Amiloride)
24. Which of the following drug causes sodium bicarbonate diuresis and is of value in the chronic management of glaucoma?
(a. Furosemide, b. Carbachol, c. Timolol, d. Acetazolamide)
25. Which of the following antiarrhythmic drug belongs to class I_A and is also associated with torsades de pointes?
(a. Sotalol, b. Phenytoin, c. Quinidine, d. Verapamil)
26. Which of the following is a nonselective β -blocker that prolongs the action potential duration by blocking potassium fluxes?
(a. Nadolol, b. Sotalol, c. Bretylium, d. Phenytoin)
27. Which of the following prostaglandin analogue can be used in peptic ulcer disease and should NOT be administered to pregnant women?
(a. Alprostadil, b. Misoprostol, c. Rioprostil, d. Epoprostenol)
28. Which of the following antiarrhythmic drug exerts positive inotropic effects and is widely used in heart failure?
(a. Flecainide, b. Disopyramide, c. Verapamil, d. Digitalis)
29. Which of the following anti-gout agent should be avoided in patients with urate stones in the urinary tract?
(a. Colchicine, b. Probenecid, c. Indomethacin, d. Allopurinol)
30. Which of the following anxiolytic drug acts through serotonin receptors and it can not be used for rapid control of anxiety?
(a. Phenobarbital, b. Buspirone, c. Zolpidem, d. Diazepam)
31. Which of the following anti-gout agent is due to inhibition of microtubule assembly?
(a. Colchicine, b. Indomethacin, c. Probenecid, d. Allopurinol)
32. All of the following NSAIDs are selective cyclooxygenase-2 (COX-2) inhibitors EXCEPT
(a. Celecoxib, b. Piroxicam, c. Meloxicam, d. Nabumetone)
33. Salicylate intoxication is characterized by all of the following EXCEPT
(a. Hypothermia, b. Hypoprothrombinemia, c. Metabolic acidosis, d. Hyperventilation)
34. Which of the following benzodiazepines (BDZs) is especially effective in managing panic disorders?

(a) Clonazepam (b) Triazolam (c) Flunitrazepam (d) Alprazolam

35. Which of the following agent is structurally not BDZs but binds selectively to BZ_1 receptors and is widely used for the treatment of insomnia?
(a. Clonidine, b. Zolpidem, c. Meprobamate, d. Butalbital)
36. Which of the following BDZs is water soluble and intravenously used for anesthetic-induction agent?
(a. Flurazepam, b. Alprazolam, c. Triazolam, d. Midazolam)
37. Which of the following BDZs would be most useful in the management of jet lag?
(a. Diazepam, b. Triazolam, c. Lorazepam, d. Clonazepam)
38. All of the following drugs can be used in male erectile dysfunction EXCEPT
(a. Alprostadil, b. Sildenafil, c. Carbachol, d. Phentolamine)
39. Which of the following drug can be used to accelerate closure of a patent ductus arteriosus?
(a. Indomethacin, b. Phenylbutazone, c. Ibuprofen, d. Piroxicam)
40. All of the following drugs can be used to treat parkinsonism EXCEPT
(a. Trihexphenidyl, b. Carbidopa, c. Haloperidol, d. Bromocriptine)

Part II. Please answer the following questions in detail. (40%)

1. Please interpret the following terms (10%).
1) K_d , 2) resting membrane potential 3) positive dromotropic effects
4) patch clamp, 5) abstinence syndrome
2. Please illustrate the sites of action of angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers. Write down at least three representative drugs respectively, and thus describe their therapeutic uses and untoward effects. (10%)
3. Please describe 5 subgroups of drugs used in the treatment of hyperlipidemias, and therefore discuss their mechanism of actions and toxicities. (10%)
4. Please design an *in vitro* experiment to investigate the drugs' competitive antagonism. You need to write down your goal, procedure, predictable results and discussion. Please make some efforts to describe your whole idea, let me easily to catch the whole picture on your experimental design. The isolated tissues and reagents are provided as follows. (10%)
Isolated tissues: guinea pig right and/or left atria
Reagents: Isoproterenol and Propranolol

一、下列方法或儀器可以研究蛋白質之何種構造或性質？(9%)

- a) Mass Spectrometry
- b) Edman degradation
- c) Analytic ultracentrifugation

二、就下列各方面比較原核細胞與真核細胞之差異(9%)

- a) mRNA 之構造特徵
- b) ribosome 之組成
- c) RNA polymerase 之種類及催化產物

三、下列 enzyme 之作用如何？(9%)

- a) AP endonuclease
- b) telomerase
- c) DNA gyrase

四、簡述下列分子如何影響細胞訊息傳遞？(6%)

- a) retinoic acid
- b) cGMP

五、寫出 glutathion 之組成(或構造)(3%)

六、CO 對人體有害，CO 結合於 free heme 之 K_d 或 P_{50} 比 O_2 低約 20000，但當 heme 為 heme-myoglobin 之狀態時，上述值減至 200，解釋此 affinity 何以不同(6%)

七、氨由 amino acids 代謝產生並輸送至肝臟去合成 urea，敘述由 amino acids 產生之氨如何由 muscle 輸送至 liver？如何由 tissue 輸送至 liver？(6%)

八、寫出真核細胞 RNA polymerase II 參與基因轉錄作用(transcription)如何被活化？(6%)

九、E.coli 之 Rec A 和 Rec BCD 如何參與 DNA recombination，簡述之(6%)

十、敘述 ubiquitin 如何參與 protein degradation 之過程？(6%)

十一、寫出由微量檢體進行親子鑑定過程中需用到那些生物技術，簡述之(6%)

十二、說明 apoB 100 和 LCAT(lecithin:cholesterol acyltransferase)在膽固醇代謝的角色。(6%)

十三、血液透析(hemodialysis)的病人易出現 carnitine 流失，若不給予適當補充會造成病人的何種代謝作用無法正常進行？(6%)

十四、說明血糖在肝臟 VLDL 形成及 fatty acid 合成分解過程中所扮演的角色。(6%)

十五、說明 calmodulin 在肝醣代謝的角色。(5%)

十六、說明 thermogenin (uncoupling protein) 對於 oxidative phosphorylation 的影響？(5%)