

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.

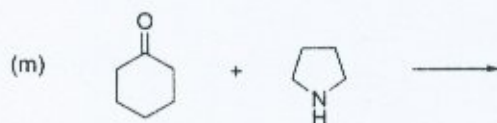
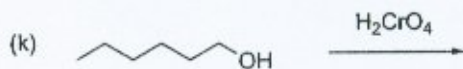
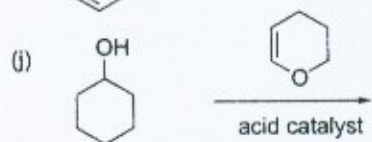
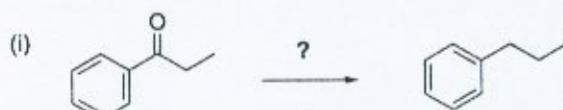
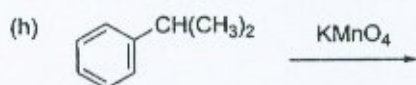
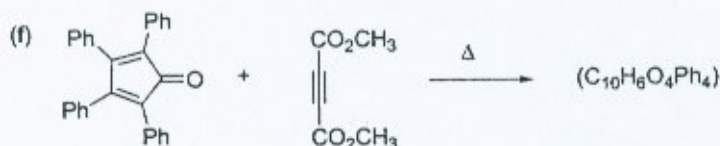
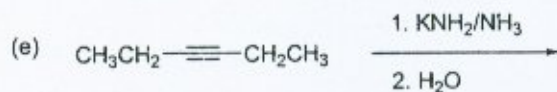
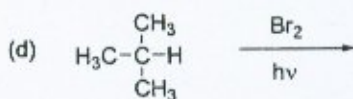
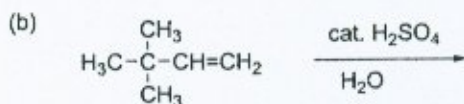
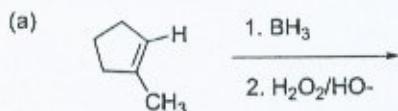
The World Health Organization says the (36) are undermining not just the battle against deadly diseases like AIDS, tuberculosis and malaria; they're affecting childhood vaccination campaigns and basic care for pregnant women.

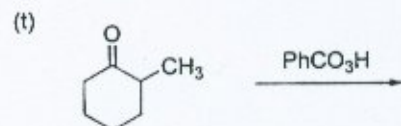
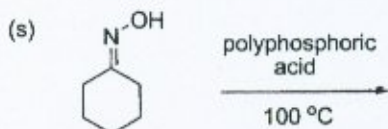
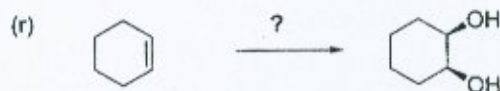
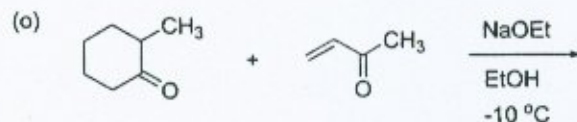
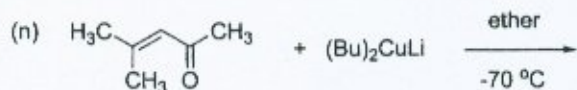
The reasons for the shortages are many, but money is (37). Rich countries need more doctors and nurses too, and salaries are higher than in Africa. The WHO says developing countries are suffering a (38) of health professionals.

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%).

(40%) 1. Give the major products or the missing reagents for each of the following reactions.





- (10%) 2. (a) Draw the structure of (2*S*,3*R*)-2,3-dibromobutane. (2%)
 (b) Describe how this compound could be synthesized from acetylene. (6%)
 (c) Is this compound optically active? (2%)

- (8%) 3. Compound **A** was isolated from the bark of the sweet birch (*Betula lenta*). Compound **A** is soluble in 5% aqueous NaOH solution but not in 5% aqueous NaHCO₃ solution. The spectral data for compound **A** are summarized below. Deduce the structure of compound **A**.

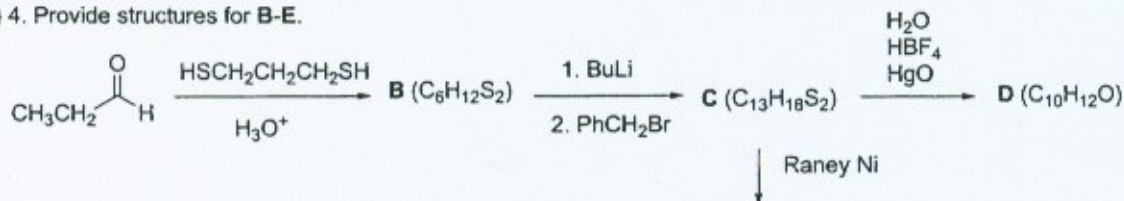
MS: $m/z = 152$ (M^+ , 49%), 121 (20%), 120 (100%), 92 (54%).

IR (neat): 3205 (br), 1675 (s), 1307 (s), 1253 (s), 1220 (s) and 757 (s) cm^{-1} .

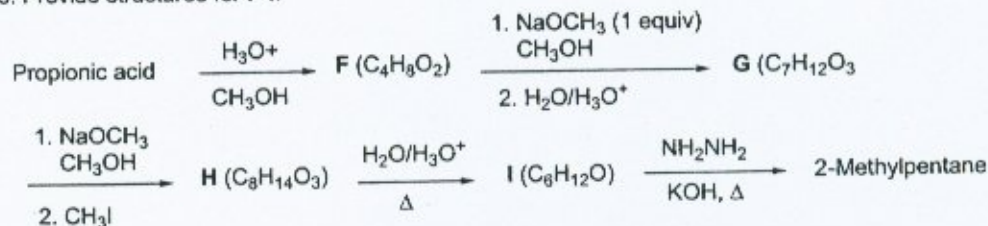
¹H NMR (CDCl₃, 300 MHz): δ 3.92 (s, 3H), 6.85 (t, $J = 8$ Hz, 1H), 7.00 (d, $J = 8$ Hz, 1H), 7.44 (t, $J = 8$ Hz, 1H), 7.83 (d, $J = 8$ Hz, 1H), 10.8 (s, 1H).

¹³C NMR (CDCl₃): δ 52.1 (q), 112.7 (s), 117.7 (d), 119.2 (d), 130.1 (d), 135.7 (d), 162.0 (s), 170.7 (s).

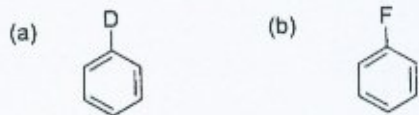
- (8%) 4. Provide structures for **B-E**.



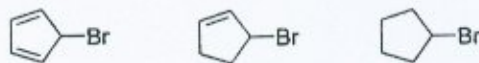
(8%) 5. Provide structures for F-I.



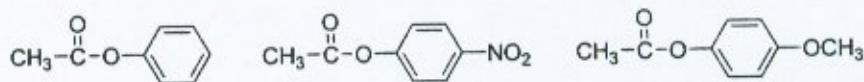
(8%) 6. How the following two compounds could be prepared from benzene?



(9%) 7. (a) Rank the following compounds by the ease with which they ionize under acidic conditions.



(b) Rank the following esters by the rate of hydrolysis.



(c) Rank of the following compounds by the rate of electrophilic aromatic substitution.



(9%) 8. Give an example for each of the following name reactions.

(a) Hofmann rearrangement (b) Fischer Indole synthesis (c) Claisen rearrangement

1. What are the prototype plant drugs? And how to evaluate the bioactivity of natural products? 15 %
2. What is the role of sialic acid in Pharmacobiotechnology? 10 %
3. Describe the classification or examples of heteroglycans, such as gums and mucilages? 15 %
4. Describe the features of senna and ginsenosides. 15 %
5. Describe the features of ginkgolides and taxol. 15 %
6. Describe the features of podophyllotoxin and etoposide. 15 %
7. 台灣第一位醫學博士暨高雄醫學大學前創校院長杜聰明先生曾研究戒除鴉片煙毒，請寫出你所知道的生藥：鴉片。15 %

一、下列方法分別用來研究蛋白質之何種構造或性質？(8%)

- a) circular dichroism
- b) gel filtration
- c) Edman degradation
- d) X-ray diffraction

二、寫出下列胺基酸之名稱(6%)

- a) 酸性
- b) 鹼性
- c) 阻礙 α -helix 構造之形成

三、寫出參與下列作用之酵素名稱及作用(15%)

- a) 修補因複製而變短之染色體 DNA
- b) 移除 Okazaki fragment 之 RNA primer(E.coli)
- c) 真核細胞轉錄產生 tRNA 之酵素
- d) 改變 DNA 構造之 linking number
- e) 被可視光活化，可直接修補 DNA 之 T-T dimer 的酵素

四、寫出下列生物技術之用途(10%)

- a) DNA microarray
- b) in situ hybridization
- c) site directed mutagenesis
- d) Southern blot
- e) yeast two-hybrid systems

五、說明何謂 reducing sugar，並列舉一個例子？(3%)

六、何謂 abzyme?其作用如何？(4%)

七、胺基酸 histidine 有三個 ionizable groups，其 pka 值分別是 1.8，6.0 及 9.2 那一個數值是 histidine side chain 之 pka？並求其 pi 值為何？(6%)

八、何謂酵素之 uncompetitive inhibitor？它如何影響 k_{cat} 和 k_{cat}/K_m 和 K_m 值？(6%)

九、描述 glycosaminoglycan，proteoglycan 及 glycoprotein 的結構特性(6%)

十、比較 phosphatidylcholine 及 sphingomyelin 結構之異同。(6%)

十一、構成 biological membrane 的 lipids 有那些？並說明其功能。(6%)

十二、比較 starch 及 glycogen 成分組成及構造(8%)

十三、從 respiratory chain 之角度說明 NADH 及 FADH₂ 攜帶之還原當量淨結果產生不同能量之機轉(8%)

十四、比較 monocistronic 及 polycistronic mRNA 代表之意義，並比較其基因調控之機轉(8%)