

高雄醫學大學九十八學年度學士後醫學系招生考試試題

科目:英文

考試時間: 80 分鐘

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答,修正時應以橡皮擦擦拭,不得使用修正液(帶),未遵照正確作答方法而致電腦無法判讀者,考生自行負責。

二、非選擇題限黑色或藍色墨水之鋼筆、原子筆或中性筆,在「答案卷」上作答。

三、試題、答案卡及答案卷必須繳回,不得攜出試場。

I. Vocabulary and Usage.

Part A : Choose the **best** answer to complete each sentence. 20 points

【單選題】每題 1 分,共 20 題,答錯 1 題倒扣 0.25 分,倒扣至本大題零分為止,未作答,不給分亦不扣分。

- More than one third of the Chinese in the United States live in California, _____ in San Francisco.
(A) profoundly (B) persistently (C) practically (D) permanently (E) predominantly
- The returns in the short _____ many be small, but over a number of years the investment will be well repaid.
(A) interval (B) range (C) span (D) term (E) rank
- Please _____ yourself from smoking and spitting in public places since the law forbids them.
(A) restrain (B) hinder (C) restrict (D) prohibit (E) control
- The most successful teaching programs are those that _____ the affective as well as the cognitive aspects of language learning.
(A) take a fancy of (B) take into account (C) take a grip on (D) take in hand (E) take task to
- I was unaware of the critical points involved, so my choice was quite _____.
(A) arbitrary (B) rational (C) mechanical (D) unpredictable (E) sensible
- In days gone by, advertisements were _____ as they told customers what a product was and how to use it.
(A) self-deceptive (B) segmentalizing (C) stradivarius (D) straightforward (E) subterraneous
- Some psychiatrists believe buried memories of childhood bullying experiences tend to _____ males than females in their adulthood.
(A) hanker (B) harass (C) haunt (D) heal (E) hunt
- Conference of Genoa 1922, in Genoa, Italy, was the first conference after World War I in which Germany and the Soviet Union were accepted _____ other nations.
(A) below par for (B) on a par with (C) up to par against (D) as par for (E) par value with
- Proverbs are the popular sayings that brighten so much Latin American talk, the boiled-down wisdom that you are as _____ hear from professors as from peasants.
(A) accessible to (B) admitted to (C) advisable to (D) apt to (E) available for
- Not that long ago many youngsters could get part-time or summer jobs that taught them the _____ of a trade they could pursue later.
(A) adjustments (B) amendments (C) improvements (D) predicaments (E) rudiments
- He had a week off, so he decided to take a trip to Bali and _____ there.
(A) cater (B) unwind (C) grip (D) conform (E) induce
- _____ projections suggest that the world population will grow before it begins to stabilize.
(A) Monographic (B) Geographic (C) Seismographic (D) Demographic (E) Bibliographic
- The boy was experiencing _____ about giving his speech, wanting to give it and yet dreading it.
(A) fear (B) ambiguity (C) irritation (D) ambivalence (E) a feat
- The Internet is one of the most common ways to _____ information, and it is done very quickly.
(A) disseminate (B) enhance (C) impeach (D) interrogate (E) stake
- Some organizations provide _____ for their staff. It's not uncommon for the top salesman to receive an expensive car as an award.
(A) internships (B) habitat (C) lectures (D) censure (E) incentives
- His argument failed because he started with a false _____.
(A) panorama (B) panacea (C) premise (D) perseverance (E) prospectus

17. The topic was well-defined and the writing _____. The instructor found nothing to criticize in the essay.
 (A) impeccable (B) putative (C) specious (D) moribund (E) ephemeral
18. Failing to thank people properly for gifts is a(n) _____ of etiquette.
 (A) avoidance (B) cause (C) evidence (D) manner (E) breach
19. A higher salary is not the only benefit; there are _____ advantages that go with the promotion.
 (A) concomitant (B) taciturn (C) equivocal (D) empirical (E) ingenuous
20. Figures that _____ the norm are different from what is typical.
 (A) deviate from (B) overlap with (C) concur with (D) are distorted (E) deduce

Part B : Choose the answer that is closest in meaning to the underlined word or phrase. 7.5 points

【單選題】每題 1.5 分，共 5 題，答錯 1 題倒扣 0.375 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

21. His comments epitomize the attitude of many parents nowadays.
 (A) reiterate (B) conceive (C) are a perfect example of
 (D) account for (E) agree with
22. As time goes by, sometime a word may be used in a pejorative sense.
 (A) disparaging (B) cliché (C) new (D) predictable (E) difficult
23. He was advised to qualify his claim.
 (A) explicate (B) modify (C) support (D) make less strong (E) exemplify
24. His attitude was construed as one of opposition to the proposal.
 (A) misunderstood (B) composed (C) interpreted (D) constructed (E) agreed
25. This study of Victorian poetry encapsulates the various views of modern experts.
 (A) incorporates (B) fabricates (C) deducts (D) eliminates (E) undertakes

II. Semantics (Questions 26-30): Choose the statement that best explains the sentence. 7.5 points

【單選題】每題 1.5 分，共 5 題，答錯 1 題倒扣 0.375 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

26. As much as his grandfather can afford good food and house, he dwells on those days of war and starvation.
 (A) As soon as his grandfather becomes wealthy, he tries to bury the old days of his sufferings.
 (B) Even though his grandfather lives a good life now, he cannot let go of the old days of sufferings.
 (C) No matter how rich his grandfather has become, he refuses to discuss days of sufferings in the past.
 (D) Whether his grandfather can afford good food and house, he contents himself with simple living.
 (E) His grandfather likes good food and house as much as he can endure the old days of sufferings.
27. Quite a few candidates admit that they have been tempted to be less than perfectly honest with their electorates.
 (A) The admission of candidates who tell white lies is a temptation.
 (B) Candidates spare no efforts attempting to perfect their honesty.
 (C) Electorates prefer candidates who are always perfectly honest.
 (D) More often than not candidates choose honesty to win votes.
 (E) The attraction to tell lies to voters is irresistible to candidates.
28. The development of an economical artificial heart is only a few transient failures away.
 (A) Artificial heart is crucial to economic development though it may fail.
 (B) The idiom “failure is the mother to success” does not always apply.
 (C) Low-cost artificial heart has to undergo transient failures to succeed.
 (D) Affordable artificial heart is soon going to be successfully developed.
 (E) Failure to develop artificial heart is due to poor economic situation.
29. He would be a rash man if he should venture to forecast the results of this event.
 (A) Anyone who dares to foretell the results of this event would be considered impetuous.
 (B) Venturing to boldly foretell the results of this event is an imprudent man’s business.
 (C) He would rather be a reckless man than to brazenly predict the results of this event.
 (D) The results of this event is anybody’s guess, reckless men are by no means exception.
 (E) He who predicts the results of this event would be considered too adventurous to be trusted.
30. The end of wisdom is to dream high enough to lose the dream in the seeking of it.
 (A) The search for ultimate wisdom lies in the pursuit of high dreams.
 (B) Wisdom comes to an end when high dreams get lost on the way.
 (C) The quest for unreachable high dream makes people gain wisdom.
 (D) As one loses more high dreams, one gains much more wisdom.
 (E) In the seeking of high dreams, wisdom is an indispensable tool.

III. Grammar and Sentence Structure.

Part A: Complete the sentence with the best choice. (Questions 31-35) 7.5 points

【單選題】每題 1.5 分，共 5 題，答錯 1 題倒扣 0.375 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

31. Sink or swim, live or die, survive or perish, _____.
(A) giving my hand and my heart to this vote (B) will I give my hand and my heart to this vote
(C) I give my hand and my heart to this vote (D) that I give my hand and my heart to this vote
(E) I'm given my hand and my heart to this vote
32. In the United States, thirteen should be considered a lucky number, _____.
(A) for the nation started with thirteen colonies (B) whose thirteen colonies set up the nation
(C) due to that thirteen nation-starting colonies (D) which nation was made up of thirteen colonies
(E) for that the nation began with thirteen colonies
33. The loneliness of the city was brought home to me one early sleepless morning, _____, but by a single one of those same pigeons which I had seen from my hotel window.
(A) by way of tossing people in lonely rooms (B) by people who had tossed in lonely rooms
(C) not only by people tossing in lonely rooms (D) not by men like me tossing in lonely rooms
(E) not tossing people in lonely rooms only
34. The mystery of how developing organisms choreograph the activity of their genes _____ is now being solved.
(A) where form and function of cells are at the right place and at the right time
(B) so at the right place and at the right time form and function the cells
(C) so that cells form and function at the right place and at the right time
(D) in which cells at the right place and time are formed and functioned
(E) whose form and function for cells are at the right time and at the right place
35. From out the haze _____, invisible, and then the growl rose to a shriek as the plane plunged toward the earth.
(A) where came the growl of a small airplane (B) coming a small airplane with growl
(C) the growl of a small airplane coming (D) came the growl of a small airplane
(E) in which a growling small airplane

Part B: For each sentence, choose one underline part that contains faulty English. (Questions 36-40) 7.5 points

【單選題】每題 1.5 分，共 5 題，答錯 1 題倒扣 0.375 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

36. This was a well-written review of current information, but the connection between nutrient stress, secondary compounds, and herbivory rates in wetland plants could receive greater coverage.
A B C
D E
37. Drawing the work of contemporary realist social work, this paper explores the ways in which an ethnographic approach contributes to the processes of classifying speakers as members of various kinds of social groups.
A B C
D E
38. Not only women are underrepresented in political assemblies and discriminated against on the labor market, but they are also subjected to threats against their physical safety.
A B C
D E
39. Previous studies have not addressed whether people who are employed in some occupations rate the maintenance of overall appearance more important than are people who are employed in other occupations.
A B C
D E
40. In many European cities, the economic contributions of business tourism outweigh that from leisure tourism by two to three times making it both a seemingly appropriate and rewarding sector for the former manufacturing cities to pursue.
A B C
D E

IV. Reading Comprehension. (Questions 41-60) 30 points

There are four passages in this section. For each passage there are 5 multiple choice questions. Choose the best answer to each question.

【單選題】每題 1.5 分，共 20 題，答錯 1 題倒扣 0.375 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

Passage #1 (Questions 41-45)

On the Internet, everybody is a millenarian. Internet journalism, according to those who produce manifestos on its behalf, represents a world-historical development--not so much because of the expressive power of the new medium as because of its

accessibility to producers and consumers. That permits it to break the long-standing choke hold on public information and discussion that the traditional media--usually known, then this argument is made, as “gatekeepers” or “the priesthood”--have supposedly been able to maintain up to now. According to Glenn Reynolds, a University law professor, who operates one of the leading blogs, *Instapundit*, millions of Americans who were once in awe of the **punditocracy** now realize that anyone can do this stuff--and that many unknowns can do it better than the lords of the profession. The rhetoric about Internet journalism produced by Reynolds and many others is plausible only because it **conflates** several distinct categories of material that are widely available online and didn't use to be. One is pure opinion, especially political opinion, which the Internet has made infinitely easy to purvey. Another is information originally published in other media—which one can find instantly on search and aggregation sites. (Source: *The New Yorker* Aug. 7 & 14, 2006, p.44)

41. According to this passage, which of the following factor contributes to the rise of internet journalism?
(A) Availability. (B) Continuity. (C) Flexibility. (D) Reliability. (E) Simplicity.
42. According to this passage, which of the following is **NOT** a characteristic of traditional media?
(A) They claim to play the role of gatekeepers.
(B) They are being replaced by online journalism.
(C) They offer forums for discussions of public issues.
(D) They provide information of all sorts and kinds.
(E) They perform religious duties just like priesthood.
43. According to this passage, which of the following can be inferred about **pundits**?
(A) Pundits contribute to making the United States a great democracy.
(B) Pundits refer exclusively to those who work in traditional media.
(C) In the Internet age, everybody can hopefully become a pundit quickly.
(D) Pundits are those who use Internet technology in a professional fashion.
(E) To be able to search information on the Internet has discredited pundits.
44. Which of the following can best replace the word **conflates** in the passage?
(A) conflicts (B) conducts (C) confuses (D) combines (E) compensates
45. According to this passage, which of the following can best describe the central idea of this passage?
(A) Internet has greatly democratized journalism.
(B) Internet has created quite a few millionaires.
(C) Internet has provisioned a variety of opinions.
(D) Internet has enabled easy search for information.
(E) Internet has become a trendy profession today.

Passage #2 (Questions 46-50)

The vast sums of money ploughed into efforts to fight diseases such as AIDS, TB and malaria in the last 10 years have saved many lives but have also sometimes undermined health systems in poor countries, according to a survey by the World Health Organisation (WHO) published recently. Funding for what the researchers call development assistance for health has quadrupled from \$5.6bn (£3.4bn) in 1990 to \$21.8bn in 2007. A worldwide outcry around the turn of the millennium over the plight of people in Africa dying of AIDS, a disease kept in check with drugs in rich countries, triggered a rush to fund big disease-fighting programs on the part of western governments, aid organizations and philanthropic donors. But until now, there has been little attempt to find out how well the money has been spent and what impact the focus on high-profile diseases has had on the everyday business of hospitals, clinics and overworked healthcare staff in the poorer countries. An extensive investigation headed by the WHO finds that, millions of people are alive because of the roll-out of HIV drugs to more than 3 million people in developing countries. The number of children protected against malaria by insecticide-impregnated bed nets rose almost eightfold from 3% in 2001 to 23% in 2006. Disease elimination programs, such as for polio and river blindness, are making good progress. Global immunization has also made big strides, the report says. However, the WHO reports warns, healthcare workers have been lured away from government hospitals by the higher salaries paid by international organizations involved in AIDS and other disease programs. Moreover, in some countries, the rush to win grants to fight AIDS, TB and malaria may have led to proposals being put forward that are inappropriate. Overall, the report found that “poor countries receive more money than countries with more resources, but there are strong **anomalies**. Sub-Saharan Africa receives the highest concentration of funding, but some African countries receive less aid than South American countries with lower disease burdens – like Peru and Argentina.”

46. Which of the following statement can best describe the main idea of this passage?
(A) AIDS patients in Africa are under control with drugs subsidized by the WHO.
(B) Money might have been unwisely spent in some poor countries' health programs.
(C) Global efforts to improve poor people's health have made significant progress.
(D) Medical professionals are in great demand to fight off AIDS, TB and malaria.
(E) Funding for development assistance for health has to be increased to be effective.

47. According to this passage, which of the following is an **ACCURATE** statement about high-profile diseases?
 (A) Malaria is almost wiped out around the world.
 (B) TB can be fully prevented now in many places.
 (C) Aids is no longer a deadly disease to Africans.
 (D) River blindness is no more an infectious disease.
 (E) Polio elimination program has made some strides.
48. According to this passage, which of the following about malaria prevention scheme is **CORRECT**?
 (A) Patients are cured with as quinine or artemisinin derivatives.
 (B) Fields and schools are spread insecticide to keep mosquito away.
 (C) Households are provided with insecticide-impregnated bed nets.
 (D) Insect repellents are sprayed to curb transmission of malaria.
 (E) Children are vaccinated to prevent infecting malaria to their risk.
49. According to this passage, which of the following is an **ACCURATE** statement about healthcare workers?
 (A) They are stable workforce in government hospitals.
 (B) They are willing to sacrifice themselves at all costs.
 (C) They are as benevolent as those wealthy donors.
 (D) They tend to have overloaded work with low pay.
 (E) They quit jobs in order to avoid contamination.
50. Which of the following is closest in meaning to the word **anomalies** in the passage?
 (A) abnormalities (B) anonymities (C) diversities (D) enmities (E) formalities

Passage #3 (Questions 51-55)

No one who had ever seen Catherine Morland in her infancy, would have supposed her born to be an heroine. Her situation in life, the character of her father and mother, her own person and disposition, were all equally against her. Her father was a clergyman, without being neglected, or poor, and a very respectable man, though his name was Richard--and he had never been handsome. He had a considerable independence, besides two good livings--and he was not in the least addicted to locking up his daughters. Her mother was a woman of useful plain sense, with a good temper, and, what is more remarkable, with a good⁵ constitution. She had three sons before Catherine was born; and instead of dying in bringing the latter into the world, as any body might expect, she still lived on--lived to have six children more--to see them growing up around her, and to enjoy excellent health herself. A family of ten children will be always called a fine family, where there are heads and arms and legs enough for the number; but the Morlands had little other right to the word, for they were in general very plain, and Catherine, for many years of her life, as plain as any. She had a thin awkward figure, a sallow skin without colour, dark lank hair, and¹⁰ strong features:--so much for her person;--and not less unpropitious for heroism seemed her mind. She was fond of all boys' plays, and greatly preferred cricket not merely to dolls, but to the more heroic enjoyments of infancy, nursing a dormouse, feeding a canary-bird, or watering a rosebush. Indeed she had no taste for a garden; and if she gathered flowers at all, it was chiefly for the pleasure of mischief--at least so it was conjectured from her always preferring those which she was forbidden to take--Such were her propensities--her abilities were quite as extraordinary. She never could learn or understand any thing¹⁵ before she was taught; and sometimes not even then, for she was often inattentive, and occasionally stupid . . .

51. The third sentence in the selection (lines 2--4) implies all of the following **EXCEPT**
 (A) Despite her father, Catherine was destined for heroic exploits.
 (B) Richard, at the time this passage was written, was a pedestrian name.
 (C) Catherine is an unlikely heroine.
 (D) Good looks are important in the society being described.
 (E) Clergymen were held in high respect.
52. By stating the fact that Catherine's father "had never been handsome," the narrator intends the reader to
 (A) be aware that Catherine also was not attractive.
 (B) infer that there is a subtle purpose behind mentioning that fact.
 (C) know all the facts about Catherine's character and appearance.
 (D) recognize that clergymen can be successful even if they are not handsome.
 (E) notice that non sequiturs are an element of human experience.
53. In reading the many facts recorded in this passage, the reader is invited to conclude that the author
 (A) wants to tell everything about her heroine.
 (B) has great respect for the family of her heroine.
 (C) recognizes that the potential for heroism exists in all people.
 (D) is giving tongue-in-check descriptions.
 (E) exaggerates and distorts the virtues and faults of her characters.
54. The technique of the author can be described as one that
 (A) encourages ironic inferences. (B) is typical in the telling of romantic tales.
 (C) is detailed and realistic. (D) shows affection for the ordinary things of life.
 (E) indicates a superior attitude.

55. The expression “for many years of her life” (line 10) suggests that, in the story that is to be told, Catherine will
- (A) suffer untold misery
 - (B) not be courted by gentlemen
 - (C) develop into a pretty woman
 - (D) remain at home to care for her aging parents
 - (E) become a lovable maiden aunt

Passage #4 (Questions 56-60)

The class basis of the education system was most explicit in the Taunton Commission Report of 1864, which dealt with schooling for ‘those large classes of English society which are comprised between the humblest and the very highest.’ It divided all secondary schools into three grades according to the social class for which they catered, the division to be determined by size of fee, by the careers for which they prepared, and by a strictly enforced leaving age: ‘the fixing of the age would be the most certain means of defining the work which the school had to do, and keeping it to that work.’ The first grade would charge 12 to 25 guineas a year for day boys, £60 to £120 for boarders, would cater for the gentry, large rentiers, successful professional men, and business men ‘whose profits put them on the same level,’ having a leaving age of 18 or 19, and prepare for university. The second grade would charge 6 to 12 guineas a year for day boys, £25 to £40 for boarders, would educate the professional and business men, large shopkeepers, and farmers for the professions, commerce and industry and have a leaving age of 16 so as to prevent them from preparing for the university. The third grade would charge only 2 to 4 guineas a year and be subsidized from public funds, would be for ‘a class distinctly lower in the scale,’ the sons of small farmers, tradesmen and superior artisans, who should be compelled to leave at 14.

The whole aim was to segregate the classes so as not to educate the lower above their station or embarrass the higher with low company: ‘class distinctions within any school are exceedingly mischievous both to those whom they raise and to those whom they lower,’ and even a few working class boys ‘seem to form an obstacle to the schools becoming attractive to others.’ Free places or closed scholarships for poor or local boys should be abolished and replaced by open exhibitions for ‘boys of real ability in whatever rank they may be found.’ The latter, of course, gave a decisive advantage to the already educated.

The Commission, and the Endowed Schools Act of 1869 which carried out most of its recommendations, did their best to ensure that the social climber should indeed be self-made, and get no help whatever from the schools.

56. What will be the **most appropriate** title for the article?
- (A) Everyone shall be educated
 - (B) Class and education in 19th-century England
 - (C) Towards modern educational ideas
 - (D) Universities versus schools
 - (E) Academic talent rewarded
57. At what age was it proposed that the children of the gentry should leave school?
- (A) 14
 - (B) 16
 - (C) 12
 - (D) 18 or 19
 - (E) 21
58. According to the article, what was the primary aim of the changes proposed in the Taunton Commission Report of 1864?
- (A) To improve educational provision for the lower classes
 - (B) To facilitate easier entry to university for the sons of the gentry
 - (C) To keep the lower classes in their place and not allow them to mingle with their social superiors
 - (D) To raise large amounts of money by charging for educational provision
 - (E) To reward exceptional talent
59. What was the upper limit in fees proposed for the sons of large shopkeepers at boarding schools?
- (A) £40
 - (B) 12 guineas
 - (C) £120
 - (D) £25
 - (E) £60
60. According to the article, which **ONE** of the following statements is incorrect?
- (A) The Report of 1864 addressed the issue of education for all classes in the UK.
 - (B) In the Report, all secondary schools were placed in one of three grades.
 - (C) Enforcing a strict leaving age was vital in maintaining the syllabus of a school.
 - (D) It was not desirable to mix working class boys with those of the upper classes.
 - (E) The introduction of open scholarships helped boys of ability irrespective of their financial and educational circumstances.

V. Writing: Write a well-structured essay in which you argue for or against the following statement (in 200 words).

20 points

Complaining is a good way of dealing with frustrations arising out of work.

Give reasons for your answer and include any relevant examples from your own knowledge or/and experience.

高雄醫學大學九十八學年度學士後醫學系招生考試試題

科目:普通生物學

考試時間: 80 分鐘

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答,修正時應以橡皮擦擦拭,不得使用修正液(帶),未遵照正確作答方法而致電腦無法判讀者,考生自行負責。
二、試題及答案卡必須繳回,不得攜出試場。

I. 【單選題】 1-50 題,每題 1 分,共計 50 分。答錯 1 題倒扣 0.25 分,倒扣至本大題零分為止,未作答,不給分亦不扣分。

1. As genetic technology makes testing for a wide variety of genotypes possible, which of the following is likely to be an increasingly troublesome issue?
 - (A) using technology to identify genes that cause criminal behaviors.
 - (B) discrimination against certain racial groups because of major genetic differences.
 - (C) alteration of human phenotypes to prevent early disease.
 - (D) the need to legislate for the protection of the privacy of genetic information.
 - (E) use of genotype information to provide positive identification of criminals.
2. The fact that the outer membrane of the nuclear envelope has bound ribosomes allows one to most reliably conclude that
 - (A) the nuclear envelope is physically continuous with the endoplasmic reticulum.
 - (B) the nuclear envelope is not part of the endomembrane system.
 - (C) at least some of the proteins that function in the nuclear envelope are made by the ribosomes on the nuclear envelope.
 - (D) nuclear pore complexes contain proteins.
 - (E) small vesicles from the Golgi fuse with the nuclear envelope.
3. Which of the following is one of the ways that the membranes of winter wheat are able to remain fluid when it is extremely cold?
 - (A) by increasing the percentage of cholesterol molecules in the membrane.
 - (B) by co-transport of glucose and hydrogen.
 - (C) by decreasing the number of hydrophobic proteins in the membrane.
 - (D) by increasing the percentage of saturated phospholipids in the membrane.
 - (E) by increasing the percentage of unsaturated phospholipids in the membrane.
4. A patient has had a serious accident and lost a lot of blood. In an attempt to replenish body fluids, distilled water, equal to the volume of blood lost, is transferred directly into one of his veins. What will be the most probable result of this transfusion?
 - (A) The patient's red blood cells will swell because the blood fluid is hypertonic compared to the cells.
 - (B) The patient's red blood cells will swell because the blood fluid is hypotonic compared to the cells.
 - (C) The patient's red blood cells will shrivel up because the blood fluid is hypertonic compared to the cells.
 - (D) The patient's red blood cells will burst because the blood fluid is hypertonic compared to the cells.
 - (E) It will have no unfavorable effect as long as the water is free of viruses and bacteria.
5. One successful form of gene therapy has involved delivery of an allele for the enzyme adenosine deaminase (ADA) to bone marrow cells of a child with SCID, and delivery of these engineered cells back to the bone marrow of the affected child. What is one major reason for the success of this procedure as opposed to many other efforts at gene therapy?
 - (A) The ADA introduced allele causes all other ADA-negative cells to die.
 - (B) The engineered cells, when reintroduced into the patient, find their way back to the bone marrow.
 - (C) No vector is required to introduce the allele into ADA-negative cells.
 - (D) The immune system fails to recognize cells with the variant gene.
 - (E) The engineered bone marrow cells from this patient can be used for any other SCID patient.
6. If a person drinks a large amount of water in a short period of time, he or she may die from water toxicity. Antidiuretic hormone can help to prevent water retention through interaction with target cells in the
 - (A) bladder.
 - (B) urethra.
 - (C) adrenal gland.
 - (D) kidney.
 - (E) anterior pituitary.
7. A researcher is using adult stem cells and comparing them to other adult cells from the same tissue. Which of the following is a likely finding?
 - (A) The two kinds of cells have virtually identical gene expression patterns in microarrays.
 - (B) The non-stem cells have fewer repressed genes.
 - (C) The non-stem cells have lost the promoters for more genes.
 - (D) The cells from the two sources exhibit different patterns of DNA methylation.
 - (E) Adult stem cells have more DNA nucleotides than their counterparts.

8. Imagine a population of 1,000 small rodents. Of these, 250 are breeding females, 250 are breeding males, and 500 are nonbreeding juveniles. What is the effective population size?
 (A) 1,500 (B) 1,000 (C) 500 (D) 300 (E) 250
9. In *E. coli*, there is a mutation in a gene called *dnaB* that alters the helicase that normally acts at the origin. Which of the following would you expect as a result of this mutation?
 (A) Single-strand binding protein could not bind to the unwound parental strands.
 (B) Replication fork will be formed.
 (C) The DNA will supercoil.
 (D) Replication will occur via RNA polymerase alone.
 (E) Replication will require a DNA template from another source.
10. A geneticist introduces a transgene into human cells and isolates five independent cell lines in which the transgene has integrated into the human genome. In four of the lines, the transgene is expressed strongly, but in the fifth there is no expression at all. Which is a likely explanation for the lack of transgene expression in the fifth cell line?
 (A) The transgene was mutated during the process of integration into the host cell genome.
 (B) A transgene integrated into a euchromatic region of the genome.
 (C) A transgene integrated into a heterochromatic region of the genome.
 (D) The host cell lacks the enzymes necessary to express the transgene.
 (E) A transgene integrated into a region of the genome characterized by high histone acetylation.
11. A covalent chemical bond is one in which
 (A) electrons are removed from one atom and transferred to another atom so that the two atoms become oppositely charged.
 (B) protons and neutrons are shared by two atoms so as to satisfy the requirements of both atoms.
 (C) the inner-shell electrons of one atom are transferred to the outer shell of another atom.
 (D) outer-shell electrons of one atom are transferred to the inner electron shells of another atom.
 (E) outer-shell electrons of two atoms are shared so as to satisfactorily fill the outer electron shells of both atoms.
12. Melatonin is a hormone produced in the pineal gland. It can be used to treat symptoms of sleep disorders and seasonal affective disorder because
 (A) it decreases production of serotonin. (B) it increases production of serotonin.
 (C) it increases production of tryptophan. (D) it activates the brainstem.
 (E) its peak production is normally at night.
13. If the Sun were to suddenly stop providing energy to the Earth, most ecosystems would vanish. Which of the following ecosystems would likely survive the longest after this hypothetical disaster?
 (A) desert (B) tropical rainforest (C) tundra
 (D) benthic ocean (E) grassland
14. Which sequence of blood flow can be observed in either a reptile or a mammal?
 (A) left ventricle → aorta → lungs → systemic circulation
 (B) vena cava → right atrium → ventricle → pulmonary circuit
 (C) right ventricle → pulmonary vein → pulmocutaneous circulation
 (D) pulmonary vein → left atrium → ventricle → pulmonary circuit
 (E) right atrium → pulmonary artery → left atrium → ventricle
15. Black fur in mice (*B*) is dominant to brown fur (*b*). Short tails (*T*) are dominant to long tails (*t*). What fraction of the progeny of the cross *BbTt* × *Bbtt* will have black fur and long tails?
 (A) 1/16 (B) 1/4 (C) 3/8 (D) 1/3 (E) 1/2
16. Hormone X produces its effect in its target cells via the cAMP second messenger system. Which of the following will produce the greatest effect in the cell?
 (A) A molecule of cAMP applied to the extracellular fluid surrounding the cell.
 (B) A molecule of cAMP injected into the cytoplasm of the cell.
 (C) A molecule of hormone X applied to the extracellular fluid surrounding the cell.
 (D) A molecule of hormone X injected into the cytoplasm of the cell.
 (E) A molecule of activated, cAMP-dependent protein kinase injected into the cytoplasm of the cell.
17. How many molecules of water are needed to completely hydrolyze a polymer that is 10 monomers long?
 (A) 12 (B) 11 (C) 10 (D) 9 (E) 8
18. An interaction between individuals of different species that benefit both partners is called
 (A) commensalism. (B) predation. (C) exploitation. (D) mutualism. (E) ammensalism.

19. In 1997, Dolly the sheep was cloned. Which of the following processes was used?
- use of mitochondrial DNA from adult female cells of another ewe.
 - fusion of an adult cell's nucleus with an enucleated sheep egg, followed by incubation in a surrogate.
 - separation of an early stage sheep blastula into separate cells, one of which was incubated in a surrogate ewe.
 - isolation of stem cells from a lamb embryo and production of a zygote equivalent.
 - replication and dedifferentiation of adult stem cells from sheep bone marrow.
20. Which of these statements about human evolution is **CORRECT**?
- Different species of the genus *Homo* have coexisted at various times throughout hominin evolution.
 - Mitochondrial DNA analysis indicates that modern humans are genetically very similar to Neanderthals.
 - The evolution of upright posture and enlarged brain occurred simultaneously.
 - Human evolution has proceeded in an orderly fashion from an ancestral anthropoid to *Homo sapiens*.
 - The ancestors of *Homo sapiens* were chimpanzees.
21. Arthropods invaded land about 100 million years before vertebrates did so. This most clearly implies that
- extant terrestrial arthropods are better adapted to terrestrial life than are extant terrestrial vertebrates.
 - arthropods evolved before vertebrates did.
 - vertebrates evolved from arthropods.
 - arthropods have had more time to co-evolve with land plants than have vertebrates.
 - ancestral arthropods must have been poorly adapted to aquatic life, thus experienced a selective pressure to invade land.
22. The number of MHC protein combinations possible in a given population is enormous. However, an individual in that population has only a couple of MHC possibilities. Why?
- Once a B cell has matured in the bone marrow, it is limited to two MHC response categories.
 - Once a T cell has matured in the thymus, it can only respond to two MHC categories.
 - MHC proteins from one individual can only be of class I or class II.
 - The MHC proteins are made from several different gene regions that are capable of rearranging in a number of ways.
 - Each of the MHC genes has a large number of alleles, but each individual only inherits 2 for each gene.
23. Which of the following statements about the adrenal gland is **CORRECT**?
- During stress, ACTH stimulates the adrenal cortex, and neurons of the sympathetic nervous system stimulate the adrenal medulla.
 - At all times, the anterior portion secretes ACTH, while the posterior portion secretes oxytocin.
 - At all times, the adrenal gland monitors calcium levels in the blood and regulates calcium by secreting the two antagonistic hormones, epinephrine and norepinephrine.
 - During stress, the alpha cells of islets secrete insulin and simultaneously the beta cells of the islets secrete glucagon.
 - During stress, TSH stimulates the adrenal cortex and medulla to secrete acetylcholine.
24. In humans, identical twins are possible because
- of convergent extension.
 - of the heterogeneous distribution of cytoplasmic determinants in unfertilized eggs.
 - of interactions between extraembryonic cells and the zygote nucleus.
 - the gray crescent divides the dorsal-ventral axis into new cells.
 - early blastomeres can form a complete embryo if isolated.
25. DDT was once considered a "silver bullet" that would permanently eradicate insect pests. Today, instead, DDT is largely useless against many insects. Which of these would have been required for this pest eradication effort to be successful in the long run?
- The frequency of DDT application should have been higher.
 - None of the individual insects should have possessed genomes that made them resistant to DDT.
 - DDT application should have been continual.
 - All habitats should have received applications of DDT at about the same time.
 - Larger doses of DDT should have been applied.
26. Assume that excessive consumption of ethanol increases the influx of negative chloride ions into "common sense" neurons whose action potentials are needed for you to act appropriately and not harm yourself or others. Thus, any resulting poor decisions associated with ethanol ingestion are likely due to
- increased membrane depolarization of "common sense" neurons.
 - more action potentials in your "common sense" neurons.
 - decreased membrane depolarization of "common sense" neurons.
 - fewer IPSPs in your "common sense" neurons.
 - more EPSPs in your "common sense" neurons.
27. Which is one of the two laws of inheritance identified by Mendel?
- The law of priority.
 - The law of independent assortment.
 - The law of neutralism.
 - The law of paternity.
 - The law of polarity.

28. In glycolysis, for each molecule of glucose oxidized to pyruvate
 (A) 4 molecules of ATP are used and 2 molecules of ATP and 4 molecules of NADH are produced.
 (B) 2 molecules of ATP are used and 4 molecules of ATP and 2 molecules of NAD are produced.
 (C) 2 molecules of ATP are used and 4 molecules of ATP and 2 molecules of NADH are produced.
 (D) 2 molecules of ATP are used and 4 molecules of ATP and 1 molecules of NADH are produced.
 (E) 2 molecules of ATP are used and 2 molecules of ATP and 2 molecules of NADH are produced.
29. In vertebrate animals, brown fat tissue's color is due to abundant mitochondria. White fat tissue, on the other hand, is specialized for fat storage and contains relatively few mitochondria. Brown fat cells have a specialized protein that dissipates the proton-motive force across the mitochondrial membranes. Which of the following might be the function of the brown fat tissue?
 (A) to allow other membranes of the cell to perform mitochondrial function.
 (B) to increase the rate of oxidative phosphorylation from its few mitochondria.
 (C) to allow the animals to regulate their metabolic rate when it is especially hot.
 (D) to regulate temperature by converting energy from NADH oxidation to heat.
 (E) to increase the production of ATP synthase.
30. Which of the following represents a difference between viruses and viroids?
 (A) Viruses contain introns; viroids have only exons.
 (B) Viruses infect many types of cells, whereas viroids infect only prokaryotic cells.
 (C) Viruses always have genomes composed of DNA, whereas viroids always have genomes composed of RNA.
 (D) Viruses have capsids composed of protein, whereas viroids have no capsids.
 (E) Viruses cannot pass through plasmodesmata; viroids can.
31. What may lead to alternations of chromosome number?
 (A) nondisjunction during meiosis. (B) hybridization. (C) chromosome breakage.
 (D) genetic recombination. (E) genetic exchange.
32. A genetic change that caused a certain *Hox* gene to be expressed along the tip of a vertebrate limb bud instead of farther back helped make possible the evolution of the tetrapod limb. This type of change is illustrative of
 (A) the influence of environment on development.
 (B) paedomorphosis.
 (C) a change in a developmental gene or in its regulation that altered the spatial organization of body parts.
 (D) heterochrony.
 (E) gene duplication.
33. The chain lengths in food webs are limited by
 (A) the amount of energy such as sunlight available in an ecosystem.
 (B) the efficiency of energy transfers that occur between trophic levels.
 (C) catastrophes.
 (D) all of the above.
 (E) A and B only.
34. _____ is the ability of a community or ecosystem to maintain structure in the face of potential disturbance.
 (A) Resilience (B) Elasticity (C) Resistance (D) Plasticity (E) Flexibility
35. Some bacteria are metabolically active in hot springs because
 (A) they are able to maintain a cooler internal temperature.
 (B) high temperatures make catalysis unnecessary.
 (C) their enzymes have high optimal temperatures.
 (D) their enzymes are completely insensitive to temperature.
 (E) they use molecules other than proteins or RNAs as their main catalysts.
36. The Shannon diversity index is a measure of
 (A) the number of different species in a community.
 (B) the abundance of a species in a community.
 (C) the types of species found in a typical climate.
 (D) the number of different species and their relative abundance in a community.
 (E) the distribution of members of a species in a community.
37. Divergence in morphology that is a result of competition between species is termed
 (A) competitive exclusion. (B) resource partitioning.
 (C) character displacement. (D) amensalism. (E) mutualism.
38. When each female in the population mates with several males, but each male mates with only one female, the mating system is referred to as
 (A) polygamy. (B) polyandry. (C) polygyny. (D) monogamy. (E) harem mating.

39. Which of the following cannot be determined using a fecundity schedule combined with a life table?
 (A) per capita rate of increase. (B) net reproductive rate. (C) mean generation time.
 (D) dispersal rates. (E) geometric rate of increase.
40. The _____ defines the physical conditions under which a species might live, in the absence of interaction with other species.
 (A) functional niche (B) realized niche (C) principle niche (D) fundamental niche (E) primary niche
41. A community is defined as
 (A) a group of organisms that all make their living in a similar way.
 (B) a group of individuals of a single species inhabiting a defined area.
 (C) the portion of a defined area that supports life.
 (D) a group of subpopulations living in separate locations with active exchange of individuals among subpopulations.
 (E) an association of interacting species inhabiting a defined area.
42. _____ species are those that, despite low biomass, exert strong effects on community structure.
 (A) Keystone (B) Cornerstone (C) Dominant (D) Prominent (E) Foundational
43. The equilibrium model of island biogeography explains diversity on islands as a balance between
 (A) speciation and extinction. (B) immigration and extinction.
 (C) speciation and emigration. (D) immigration and emigration.
 (E) speciation and immigration.
44. The study of the relationship between climate and the timing of ecological events is called
 (A) ecology. (B) phenology. (C) succession. (D) climatology. (E) life history theory.
45. In general, reptiles are considered to be a/an _____.
 (A) poikilotherm (B) homeotherm (C) endotherm
 (D) heterotherm (E) A and D are correct
46. El Niño events
 (A) occur when the Southern Oscillation index is high.
 (B) occur when barometric pressure is lower in the western Pacific than in the eastern Pacific.
 (C) include the appearance of warm currents on the Pacific coast of South America.
 (D) are always accompanied by La Niña events at the same time.
 (E) are accompanied by westward movement of the location of storm generation in the Pacific.
47. Mycorrhizal fungi (directly) help their plant partners acquire
 (A) sugars. (B) sunlight. (C) seed dispersal. (D) soil nutrients. (E) pollination.
48. $dN/dt = r_{max}N [(K - N)/K]$ represents
 (A) annual growth rate. (B) geometric population growth.
 (C) exponential growth rate. (D) logistic growth.
 (E) none of the choices are correct.
49. Bony marine fish
 (A) drink sea water.
 (B) secrete Na^+ into the surrounding water.
 (C) are hyperosmotic compared to the surrounding water.
 (D) both drink sea water and secrete Na^+ into the surrounding water.
 (E) drink sea water, secrete Na^+ into the surrounding water, and are hyperosmotic compared to the surrounding water.
50. Whether during mitosis or meiosis, sister chromatids are held together by proteins referred to as cohesions. Such molecules must have which of the following properties?
 (A) They must reattach to chromosomes during G1.
 (B) They must be removed before anaphase can occur.
 (C) They must be intact for nuclear envelope reformation.
 (D) They must be removed before meiosis can begin.
 (E) They must persist throughout the cell cycle.
- II. 【單選題】51-75 題，每題 2 分，共計 50 分。答錯 1 題倒扣 0.5 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。
51. Analysis of the Lotka-Volterra competition model implies that two competitors can coexist only when
 (A) interspecific competition is stronger than intraspecific competition.
 (B) intraspecific competition is stronger than interspecific competition.
 (C) intraspecific and interspecific competition are equally strong.
 (D) predation or parasitism is stronger than interspecific competition.
 (E) actually, the model implies that two competitors can never coexist.

52. Mouse mutations can affect an animal's appetite and eating habits. The *ob* gene produces a satiety factor (the hormone leptin). The *db* gene product is required to respond to the satiety factor (the leptin receptor). Most obese humans produce normal or increased levels of leptin without satiety. Which might provide an answer to at least some human obesity if a means to do so is found?
- (A) overexpression of the leptin receptor gene (B) activation of receptors for leptin
(C) supplementary leptin (D) inactivation of leptin
(E) mutation of the leptin receptor gene
53. The "immunotolerance" of a pregnant woman toward her unborn child is the result of
- (A) the complete physical separation from her cells and those of the unborn child.
(B) the tenacity with which the unborn child's immune system counteracts the woman's immune system.
(C) the unborn child having enough of the woman's identity so as to escape detection as foreign.
(D) modern medical intervention during every pregnancy.
(E) the relative quiescence of a pregnant woman's immune system compared to when she was not pregnant.
54. A mutation that inactivates the regulatory gene of a repressible operon in an *E. coli* cell would result in
- (A) complete inhibition of transcription of the structural gene controlled by that regulator.
(B) continuous transcription of the structural gene controlled by that regulator.
(C) irreversible binding of the repressor to the operator.
(D) inactivation of RNA polymerase by alteration of its active site.
(E) continuous translation of the mRNA because of alteration of its structure.
55. The alternative pathways of photosynthesis using the C₄ or CAM systems are said to be compromises. What is the reason?
- (A) CAM plants allow more water loss, while C₄ plants allow less CO₂ into the plant.
(B) C₄ plants allow less water loss but CAM plants allow more water loss.
(C) C₄ and CAM plants both minimize photorespiration and optimizes the Calvin cycle.
(D) C₄ and CAM plants minimize both water loss and rate of photosynthesis.
(E) C₄ plants compromises on water loss and CAM compromises on photorespiration.
56. The role of a metabolite that controls a repressible operon is to
- (A) increase the production of inactive repressor proteins.
(B) bind to the repressor protein and activate it.
(C) bind to the repressor protein and inactivate it.
(D) bind to the operator region and block the attachment of RNA polymerase to the promoter.
(E) bind to the promoter region and decrease the affinity of RNA polymerase for the promoter.

57.

Gene	<i>b</i>	0			
	<i>cn</i>	9	0		
	<i>rb</i>	3.5	6.5	0	
	<i>vg</i>	19	9.0	16	0
		<i>b</i>	<i>cn</i>	<i>rb</i>	<i>vg</i>

b = black body
cn = cinnabar eyes
rb = reduced bristles
vg = vestigial wings

The numbers in the boxes are the recombination frequencies in between the genes (in percent).

In a series of mapping experiments, the recombination frequencies for four different linked genes of *Drosophila* were determined as shown in the figure. What is the order of these genes on a chromosome map?

- (A) *cn-rb-b-vg* (B) *b-rb-cn-vg* (C) *rb-cn-vg-b* (D) *vg-b-rb-cn* (E) *vg-cn-b-rb*

58. The steps below refer to various stages in transmission at a chemical synapse:

1. The synaptic vesicles release neurotransmitter into the synaptic cleft.
2. The ligand-gated ion channels open.
3. An action potential depolarizes the membrane of the axon terminal.
4. Calcium ions rush into neuron's cytoplasm.
5. Neurotransmitter binds with receptors associated with the postsynaptic membrane.

Which sequence of events is **CORRECT**?

- (A) 1 → 2 → 3 → 4 → 5 (B) 3 → 4 → 1 → 5 → 2 (C) 3 → 1 → 5 → 4 → 2
(D) 4 → 3 → 1 → 2 → 5 (E) 5 → 1 → 2 → 4 → 3

59. Eukaryotic telomeres replicate differently than the rest of the chromosome. Which of the following is the cause?

- (A) DNA polymerase that cannot replicate the leading strand template to its 5' end.
(B) The evolution of telomerase enzyme.
(C) Gaps left at the 3' end of the lagging strand because of the need for a 5' onto which nucleotides can attach.
(D) Gaps left at the 3' end of the lagging strand because of the need for a primer.
(E) Gaps left at the 5' end of the lagging strand because of the need for a 3' onto which nucleotides can attach.

69. How do ADH and RAAS work together in maintaining osmoregulatory homeostasis?
- ADH monitors appropriate osmolarity by reabsorption of water, and RAAS maintains osmolarity by stimulating K^+ reabsorption.
 - ADH monitors appropriate osmolarity by reabsorption of water, and RAAS maintains osmolarity by stimulating Cl^- reabsorption.
 - Only when they are together in the receptor sites of proximal tubule cells, will reabsorption of essential nutrients back into the blood take place.
 - ADH monitors appropriate osmolarity by reabsorption of water, and RAAS maintains osmolarity by stimulating Na^+ reabsorption.
 - ADH and RAAS work antagonistically; ADH stimulates water reabsorption during dehydration and RAAS removes water when it is in excess in body fluids.
70. From earliest to latest, the overall sequence of early development proceeds as follows:
- first cell division → synthesis of embryo's DNA begins → acrosomal reaction → cortical reaction.
 - first cell division → cortical reaction → acrosomal reaction → synthesis of embryo's DNA begins.
 - acrosomal reaction → cortical reaction → synthesis of embryo's DNA begins → first cell division.
 - cortical reaction → synthesis of embryo's DNA begins → acrosomal reaction → first cell division.
 - cortical reaction → acrosomal reaction → first cell division → synthesis of embryo's DNA begins.
71. Which of the following is the **CORRECT** sequence that occurs during the excitation and contraction of a muscle cell?
- Calcium is released and binds to the troponin complex.
 - Tropomyosin shifts and unblocks the cross-bridge binding sites.
 - Transverse tubules depolarize the sarcoplasmic reticulum.
 - The thin filaments are ratcheted across the thick filaments by the heads of the myosin molecules using energy from ATP.
 - An action potential in a motor neuron causes the axon to release acetylcholine, which depolarizes the muscle cell membrane.
- (A) 2, 1, 3, 5, 4 (B) 2, 1, 3, 4, 5 (C) 5, 3, 2, 4, 1 (D) 5, 3, 1, 2, 4 (E) 5, 3, 2, 1, 4
72. If a *Drosophila* female has a homozygous mutation for a maternal effect gene,
- only her male offspring will show the mutant phenotype.
 - her offspring will show the mutant phenotype only if they are also homozygous for the mutation.
 - all of her offspring will show the mutant phenotype, regardless of their genotype.
 - only her female offspring will show the mutant phenotype.
 - she will not develop past the early embryonic stage.
73. Which of the following poses the greatest potential threat to biodiversity?
- replanting after a clear cut, a monoculture of Douglas fir trees on land that consisted of old growth Douglas fir, western cedar, and western hemlock.
 - trapping and relocating large predators, such as mountain lions, that pose a threat as they move into areas of relatively dense human populations.
 - importing an Asian insect into the United States to control a weed that competes with staple crops.
 - allowing previously used farmland go fallow and begin to fill in with weeds and then shrubs and saplings.
 - releasing sterilized rainbow trout to boost the sport fishing of a river system that contains native brook trout.
74. "Primary" succession is succession that
- involves establishment of primary producers.
 - leads to establishment of a climax community dominated by primary producers.
 - occurs on newly exposed geologic substrates, not organic soil.
 - occurs where organic soils have been exposed but not destroyed by disturbance.
 - occurs after fire or agricultural abandonment.
75. The data were obtained from a study of the length of time spent in each phase of the cell cycle by cells of three eukaryotic organisms designated beta, delta, and gamma.

Cell Type	G ₁	S	G ₂	M
Beta	18	24	12	16
Delta	100	0	0	0
Gamma	18	48	14	20

Table : Minutes Spent in Cell Cycle Phases

Of the following, the best conclusion concerning the difference between the S phases for beta and gamma is that

- gamma contains 48 times more DNA than beta.
- beta and gamma contain the same amount of DNA.
- beta contains more RNA than gamma.
- beta is a plant cell and gamma is an animal cell.
- gamma contains more DNA than beta.

高雄醫學大學九十八學年度學士後醫學系招生考試試題

科目:有機化學

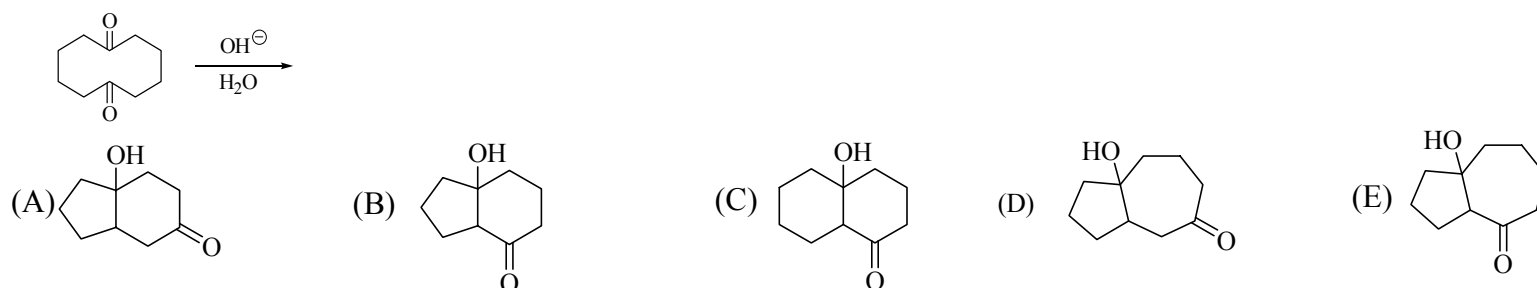
考試時間: 80 分鐘

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答,修正時應以橡皮擦擦拭,不得使用修正液(帶),未遵照正確作答方法而致電腦無法判讀者,考生自行負責。
二、試題及答案卡必須繳回,不得攜出試場。

I. Choose one correct answer for the following questions

【單選題】每題 1 分,共計 60 分,答錯 1 題倒扣 0.25 分,倒扣至本大題零分為止,未作答,不給分亦不扣分。

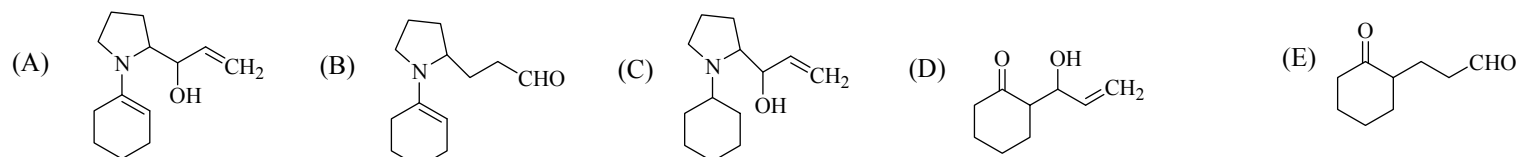
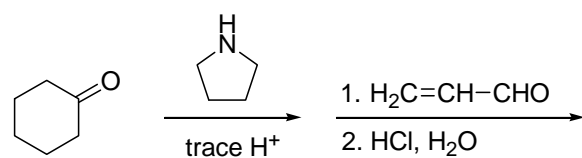
1. What is the carbon nucleophile which attacks molecular bromine in the acid-catalyzed α -bromination of a ketone?
(A) an enol (B) a Grignard reagent (C) an acetylide (D) a carbocation (E) an enolate
2. What species is attacked by the alcohol's hydroxyl in the mechanism of the Swern oxidation?
(A) dimethylchlorosulfonium ion (B) dimethylsulfoxide (C) oxalyl chloride
(D) oxalium ion (E) aldehyde or ketone
3. When pyridine is treated with a mixture of nitric and sulfuric acids, the major product is _____.
(A) 2-nitropyridine (B) 3-nitropyridine (C) 4-nitropyridine (D) 3-aminopyridine (E) 4-aminopyridine
4. What is the major organic product of the following reaction?



5. When (*R*)-butan-2-ol is treated with TsCl in pyridine, the product formed is _____.
(A) a single enantiomer (B) a racemic mixture
(C) a mixture of diastereomers (D) an achiral compound (E) none of the above
6. What kind of polymer is produced in the following reaction?
7. Which of the following reagents should be used to convert hex-3-yne to (*E*)-hex-3-ene?
(A) H_2 , Pt (B) Na, NH_3 (C) H_2 , Lindlar's catalyst (D) H_2SO_4 , H_2O (E) $HgSO_4$, H_2O
8. S_N1 reaction usually proceed with _____.
(A) slightly more inversion than retention at the center undergoing substitution
(B) slightly more retention than inversion at the center undergoing substitution
(C) equal amounts of inversion and retention at the center undergoing substitution
(D) complete inversion at the center undergoing substitution
(E) complete retention at the center undergoing substitution

9. Peptide bonds are _____.
(A) ester linkages (B) imido linkages (C) amide linkages (D) ether linkages (E) disulfide linkages

10. What is the major product of the following reaction?

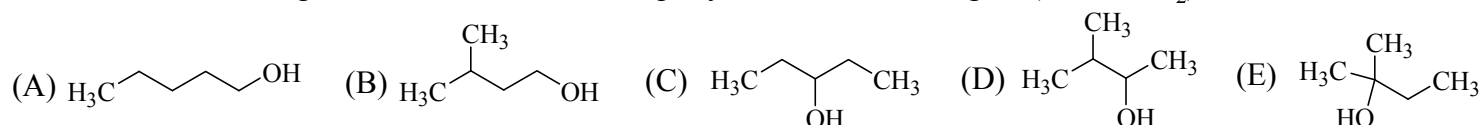


11. What compound is produced when $(\text{CH}_3)_2\text{CHCH}_2\text{Br}$ is subjected to the following sequence of steps:

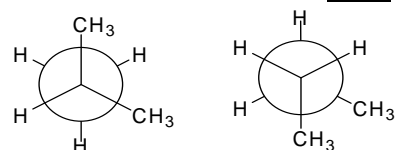
1. Mg, Et_2O , 2. CO_2 , 3. H_3O^+

- (A) 2-methylpropanoic acid (B) 3-methylpropanoic acid (C) 2-methylbutanoic acid
(D) 3-methylbutanoic acid (E) 2-methylhexanoic acid

12. Which of the following alcohols will react most rapidly with the Lucas reagent (HCl , ZnCl_2)?



13. The structures below are ____.



- (A) not isomers (B) conformational isomers (C) structural isomers (D) *cis-trans* isomers (E) both B and D

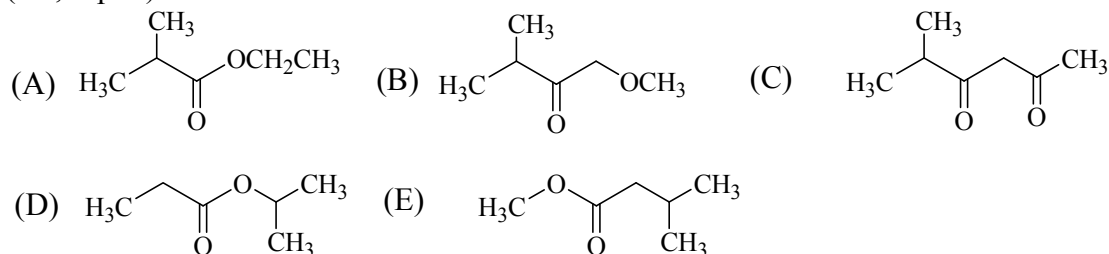
14. The Hell-Volhard-Zelinsky reaction involves ____.

- (A) the α -bromination of carboxylic acids (B) the α -bromination of ketones
(C) the bromination of alcohols (D) the oxidation of aldehydes to acids (E) none of the above

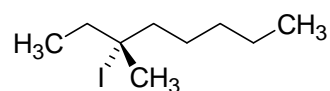
15. When indole is treated with bromine in dioxane at 0°C , the major organic product is ____.

- (A) 2-bromoindole (B) 3-bromoindole (C) 4-bromoindole (D) 5-bromoindole (E) 6-bromoindole

16. Which compound has a ^1H NMR spectrum consisting of the following peaks: 0.9 (6H, d), 1.0 (3H, t), 2.2 (2H, q), and 4.0 (1H, septet)?



17. How many distinct alkene products are possible when the alkyl iodide below undergoes E2 elimination?



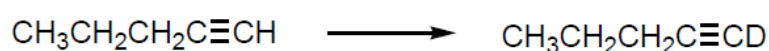
- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

18. Which of the following describes the compound below?



- (A) bridged bicyclic (B) fused bicyclic (C) spiro bicyclic (D) bridged tricyclic (E) fused tricyclic

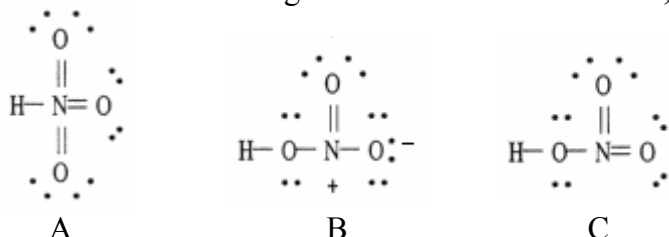
19. What method will produce the transformation?



- (A) Li / ND_3 (B) $(\text{sia})_2\text{BD}$ then H_2O (C) $\text{CH}_3\text{CH}_2\text{MgBr}$ then D_3O^+ (D) $(\text{sia})_2\text{BD}$ then D_2O (E) LiAlD_4 then D_2O

20. Energy is _____ when bonds are formed and is _____ when bonds are broken; therefore, bond dissociation energies are always _____.
- (A) released / consumed / exothermic (B) released / consumed / endothermic (C) consumed / released / exothermic
(D) consumed / released / endothermic (E) consumed / released / isothermic

21. Which of the following are correct Lewis structures, including formal charges, for nitric acid, HNO₃?



- (A) A only (B) B only (C) C only (D) both B and C (E) A, B, and C

22. Which of the following alkyl chlorides is least likely to undergo rearrangement during a solvolysis reaction?

- (A) *cis*-1-chloro-2-ethylcyclohexane (B) *trans*-1-chloro-2-ethylcyclohexane (C) 2-chloro-4-methylpentane
(D) 2-chloro-3-methylpentane (E) 2-chloro-2-methylpentane

23. Which of the following descriptions of the nucleoside uridine does not apply to the structure of the molecule?

- (A) The uracil base is directly bonded to the 1' position of ribofuranose in the α position.
(B) The ribofuranose moiety is found in only the D configuration.
(C) Nitrogen, at position 1 in the uracil base, is directly bonded to the ribofuranose moiety.
(D) The 5' OH group is replaced with phosphate(s) in the nucleotide structure.
(E) none of the above

24. Which of the following is correct in order of decreasing nucleophilicity toward methyl iodide in methanol?

- (A) CH₃O⁻ > CH₃S⁻ > CN⁻ > Br⁻ (B) CH₃O⁻ > CN⁻ > CH₃S⁻ > Br⁻ (C) CN⁻ > CH₃O⁻ > CH₃S⁻ > Br⁻
(D) CH₃S⁻ > Br⁻ > CH₃O⁻ > CN⁻ (E) CH₃S⁻ > CN⁻ > CH₃O⁻ > Br⁻

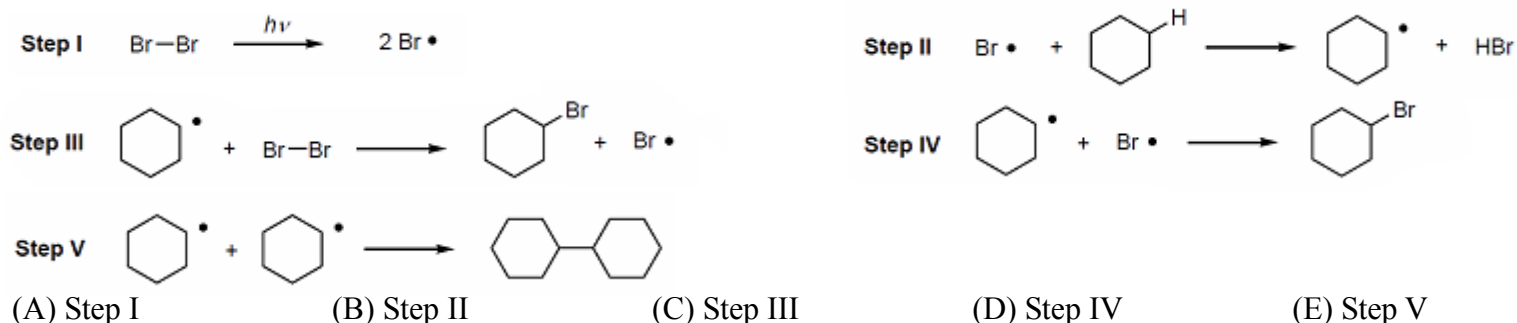
25. Which of the following compounds will undergo S_N2 reaction most readily?

- (A) (CH₃)₃CCH₂I (B) (CH₃)₃CCl (C) (CH₃)₂CHI (D) (CH₃)₂CHCH₂CH₂CH₂I (E) (CH₃)₂CHCH₂CH₂CH₂Cl

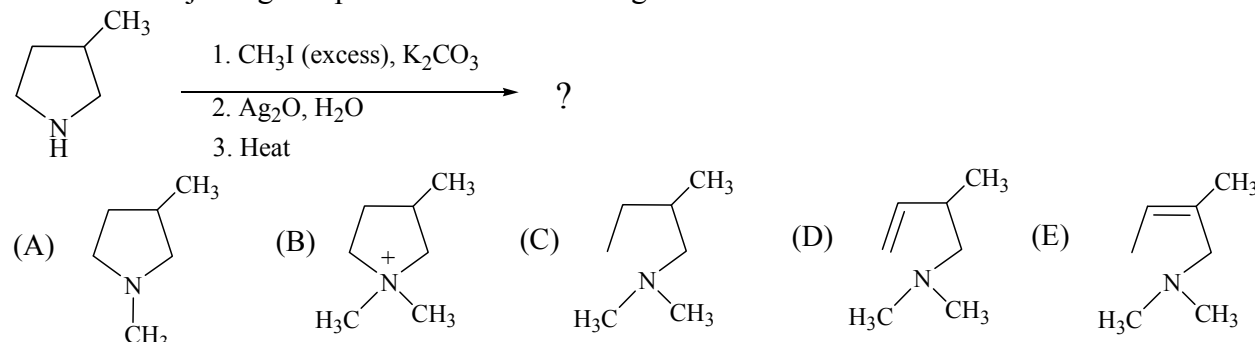
26. Which of the following carbonyl compounds can be reduced by H₂/Raney Ni?

- (A) acetic acid (B) ethyl acetate (C) acetyl chloride (D) acetamide (E) *N*-methyl acetamide

27. Which of the following is the rate-determining step for the monobromination of cyclohexane?



28. What is the major organic product of the following reaction?



29. Which are ylides?

- I Ph₃P⁺CH₂⁻CH₂ II Ph₃P⁺CH⁻CH₃ III (CH₃)₂S⁺CH⁻CH₃ IV (CH₃)₂S⁺CH₂⁻CH₂
(A) only I (B) only II (C) I and II (D) II and III (E) III and IV

30. Which of the following chemical reactions could be used to distinguish between a polyunsaturated vegetable oil and a petroleum oil containing a mixture of saturated and unsaturated hydrocarbons?
 (A) addition of bromine in carbon tetrachloride (B) ozonolysis (C) hydrogenation
 (D) lipidification (E) saponification

31. When an alkene is subjected to treatment with $\text{Hg}(\text{OAc})_2$ in alcohol followed by reaction with NaBH_4 , what new class of compound is formed?

- (A) ether (B) epoxide (C) alkane (D) syn diol (E) alkyne

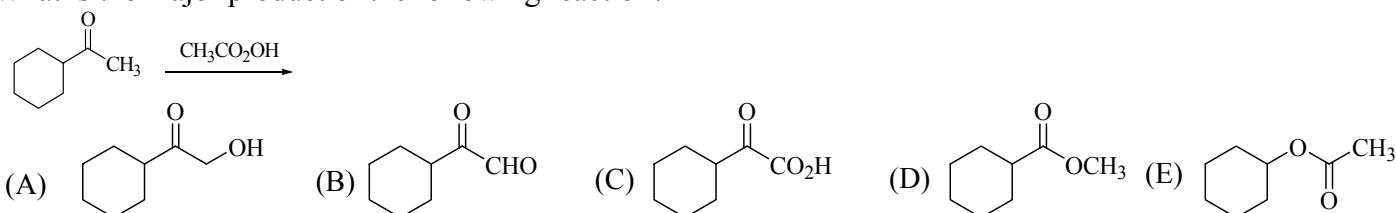
32. Distillation of mixtures of ethanol and water cannot increase the ethanol content of the mixture above 95% because this solution boils at a lower temperature than either pure ethanol or pure water. The term which describes this lower boiling mixture is _____.

- (A) miscible (B) azeotrope (C) isoniazide (D) epimerization (E) none of these

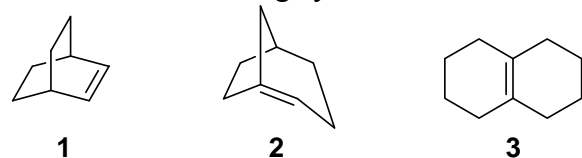
33. The methyl ester of a carboxylic acid can be synthesized by directly using _____.

- (A) SOCl_2 (B) PCl_5 (C) CH_2N_2 (D) $\text{C}_2\text{O}_2\text{Cl}_2$ (E) CH_3NH_2

34. What is the major product of the following reaction?

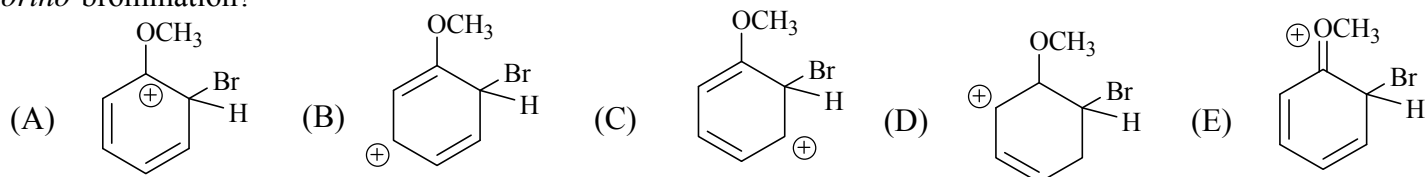


35. Which of the following cycloalkenes would be expected to be stable?

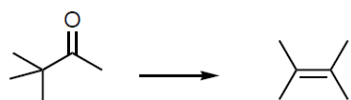


- (A) 1 and 2 (B) 2 and 3 (C) 2 (D) 1 and 3 (E) none are stable

36. Which of the following structures is the most important contributor to the resonance hybrid formed when anisole undergoes *ortho*-bromination?



37. Which series of reactions would best facilitate the following conversion?

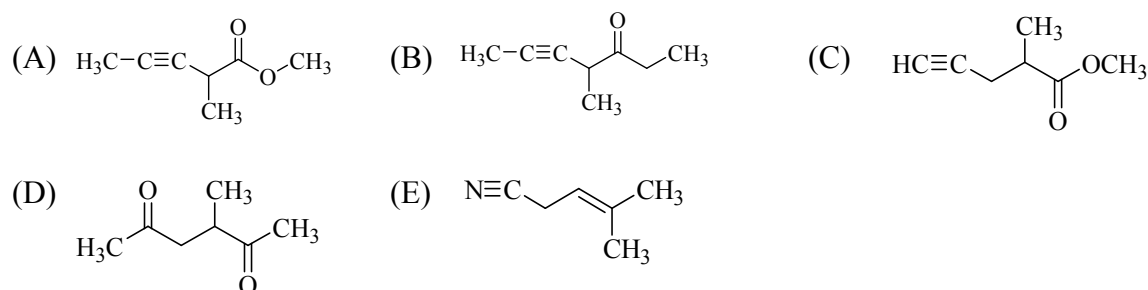


- (A) 1. KMnO_4 (aq), 2. $\text{Hg}(\text{OAc})_2$ (aq), 3. $\text{NaBH}_4/\text{OH}^-$ (B) 1. NaBH_4 , 2. $\text{H}_3\text{PO}_4/\Delta$ (C) 1. CH_3MgBr , 2. H_3O^+
 (D) 1. NaBH_4 , 2. $\text{HBr}_{(g)}$, 3. Mg/ether , 4. H_3O^+ (E) 1. Raney nickel, 2. CH_3MgBr , 3. H_3O^+

38. A pure sample of (*S*)-phenylalanine has a specific rotation of $+70^\circ$. A mixture of the two enantiomers of phenylalanine gives a specific rotation of -7.0° . What are the percentages of the *S* and *R* enantiomers in the mixture?

- (A) 75 % *S*, 25 % *R* (B) 65 % *S*, 35 % *R* (C) 55 % *S*, 45 % *R* (D) 45 % *S*, 55 % *R* (E) 35 % *S*, 65 % *R*

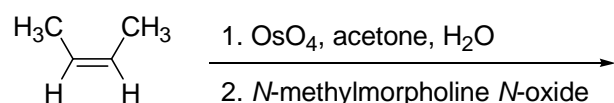
39. Which of the following compounds would you expect to show IR absorptions at 1735, 2100, 3300 cm^{-1} ?



40. Which of the following compounds would most likely be used in the preparation of isobutylbenzene from benzene?

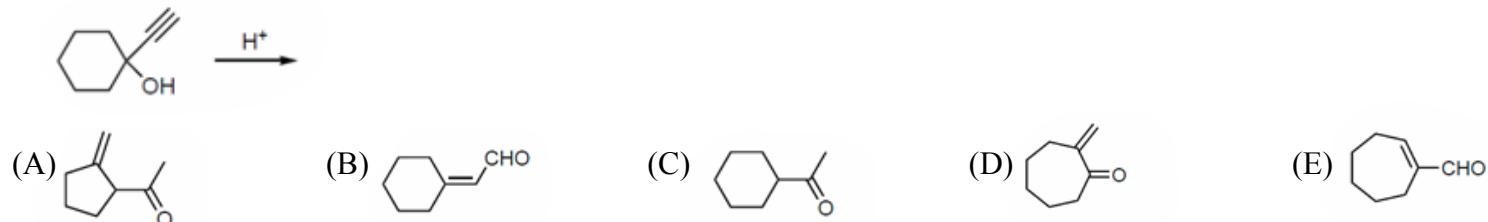
- (A) $(\text{CH}_3)_2\text{CHCOCl}$ (B) $(\text{CH}_3)_2\text{CHCH}_2\text{Cl}$ (C) $(\text{CH}_3)_2\text{CHCH}_2\text{Br}$
 (D) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$ (E) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COCl}$

41. What is the product of the following reaction?



- (A) acetaldehyde (B) acetic acid (C) racemic (2*R*,3*R*) and (2*S*,3*S*)-2,3-butanediol
 (D) *meso*-2,3-butanediol (E) *cis*-2,3-epoxybutane

42. Provide the structure of the major organic product in the following reaction:



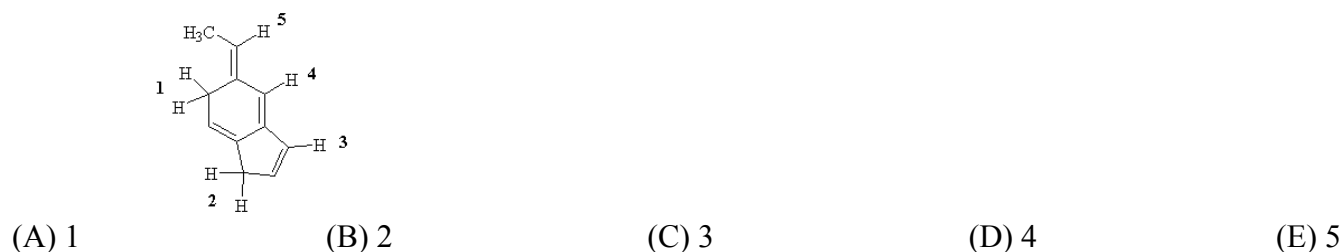
43. Which of the following describes the most stable conformation of *trans*-1-isopropyl-3-methylcyclohexane?

- (A) Both groups are equatorial.
 (B) Both groups are axial.
 (C) The isopropyl group is equatorial and the methyl group is axial.
 (D) The isopropyl group is axial and the methyl group is equatorial.
 (E) none of the above

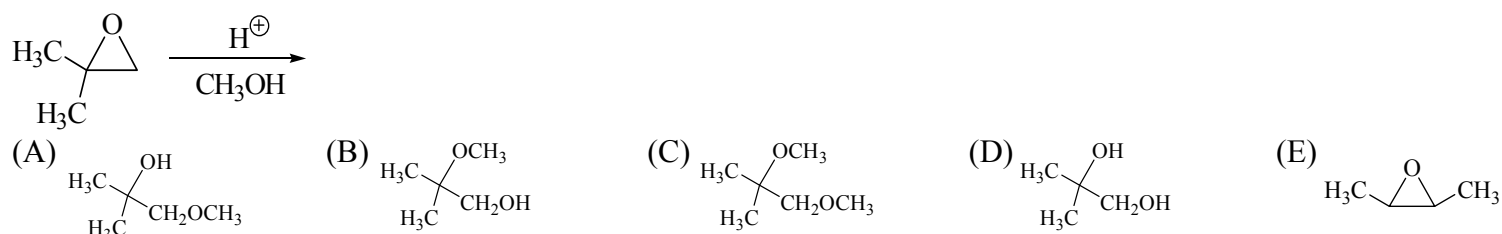
44. Which of the following compounds will react most rapidly with HCl?

- (A) 5-methyl-1-hexene (B) 4-methyl-1-hexene (C) (*E*)-5-methyl-2-hexene
 (D) (*E*)-2-methyl-3-hexene (E) 2-methyl-2-hexene

45. Which of the labeled H atoms (1-5) in the following molecule would be predicted to be the most acidic?



46. What is the major product of the following reaction?



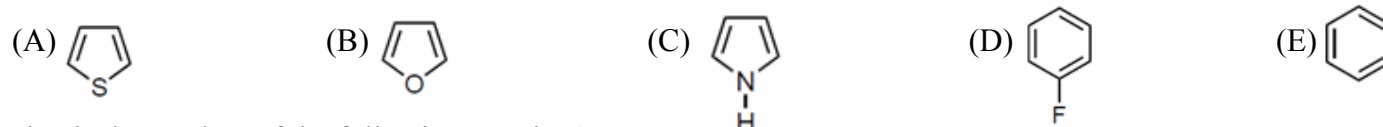
47. Which of the following compounds exhibits the pattern of *m/z* values shown below? 41, 43, 57, 87, 101, 116

- (A) *n*-propylbromide (B) isopropyl bromide (C) 2-hexanol
 (D) 2-butanone (E) *sec*-butyl isopropyl ether

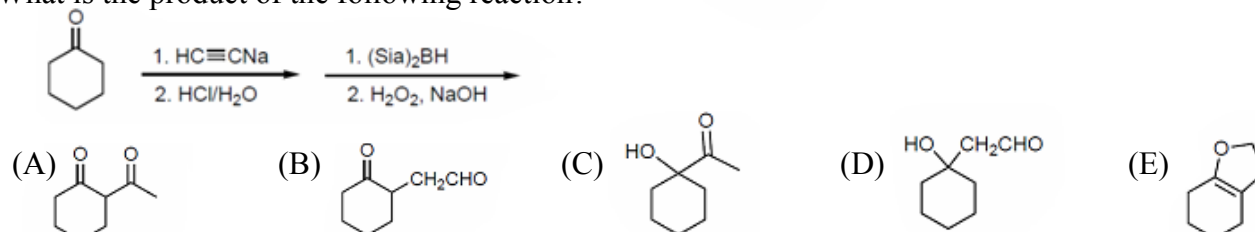
48. Which of the following statements correctly pertains to a pair of enantiomers?

- (A) They rotate the plane of polarized light by exactly the same amounts and in opposite directions.
 (B) They rotate the plane of polarized light by differing amounts and in opposite directions.
 (C) They rotate the plane of polarized light by differing amounts and in the same directions.
 (D) They have the same specific rotation, but they have different melting points.
 (E) They have the same melting points, but they have different boiling points.

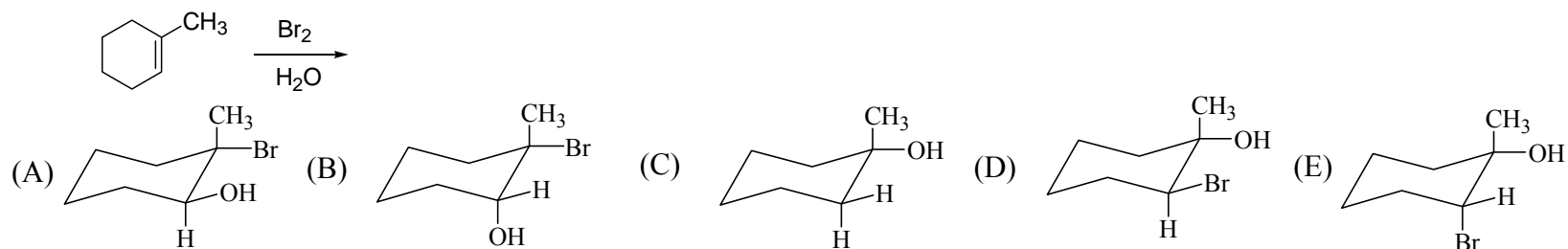
49. Which of the following compounds is the most reactive toward electrophilic aromatic substitution?



50. What is the product of the following reaction?



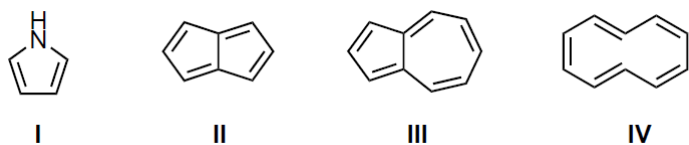
51. What is the major product of the following reaction?



52. Which of the following compounds has the most signals in the noise-decoupled ^{13}C NMR spectrum?

- (A) *o*-dibromobenzene (B) *m*-dibromobenzene (C) *p*-dibromobenzene
(D) 1,3,5-tribromobenzene (E) 1,2,3,4-tetrabromobenzene

53. Identify the aromatic compounds.

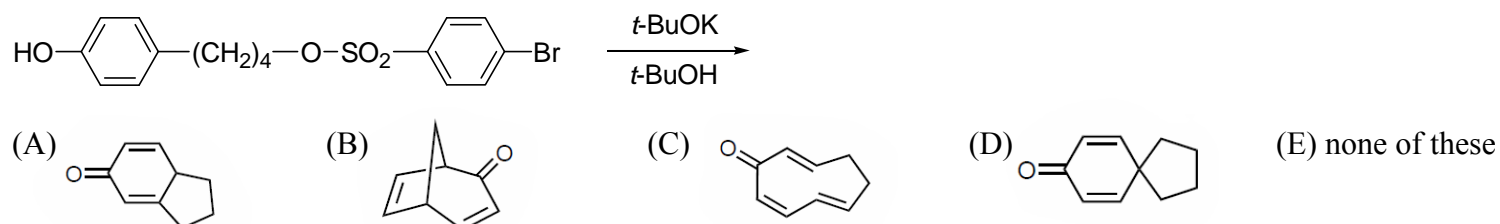


- (A) I and II (B) II and III (C) I and III (D) III and IV (E) I, III and IV

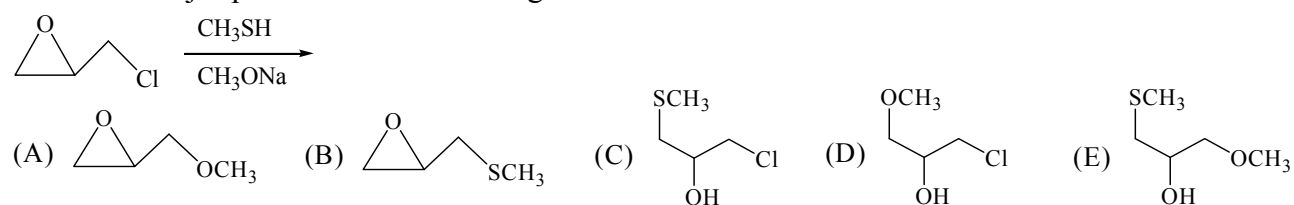
54. Which of the following compounds has the highest melting point?

- (A) benzene (B) toluene (C) *o*-dichlorobenzene (D) *m*-dichlorobenzene (E) *p*-dichlorobenzene

55. Provide the structure of the major organic product in the following reaction.



56. What is the major product of the following reaction?



57. A sample of compound X is subjected to elemental analysis and the following percentages by weight are found: 39.97% C, 6.73% H, and 53.30% O. The molecular weight of X is 90. What is the empirical formula of X?

- (A) $\text{C}_6\text{H}_8\text{O}$ (B) $\text{C}_2\text{H}_4\text{O}_2$ (C) $\text{C}_4\text{H}_{10}\text{O}_2$ (D) $\text{C}_3\text{H}_6\text{O}_3$ (E) CH_2O

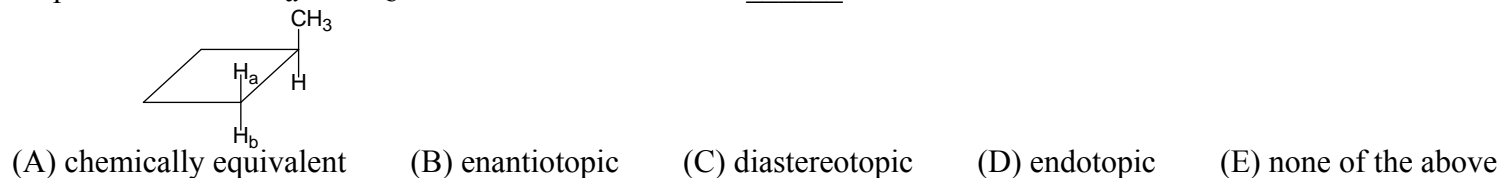
58. Which of the following conditions will drive the equilibrium of the Fischer esterification towards ester formation?

- (A) addition of water (B) removal of water as it is formed (C) addition of an inorganic acid as a catalyst
(D) addition of alcohol (E) both B and D

59. The Wittig reaction involves ____.

- (A) formation of carboxylic acids (B) formation of alkenes (C) formation of α,β -unsaturated carboxylic acids
(D) formation of β -ketoesters (E) formation of alcohols

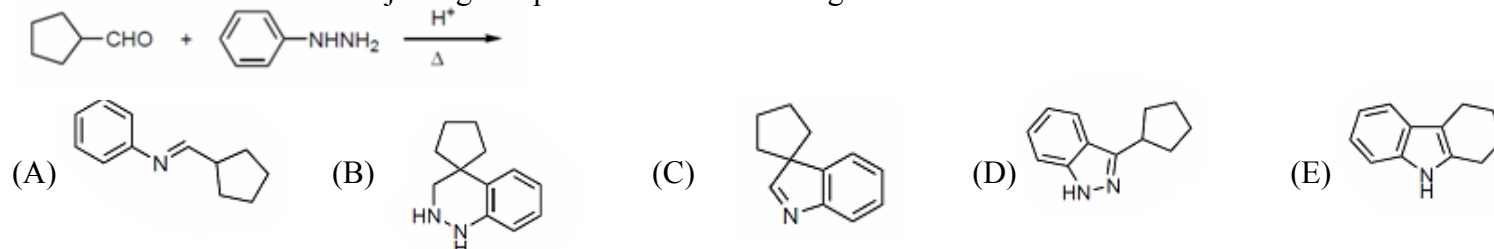
60. The protons marked H_a and H_b in the molecule below are ____.



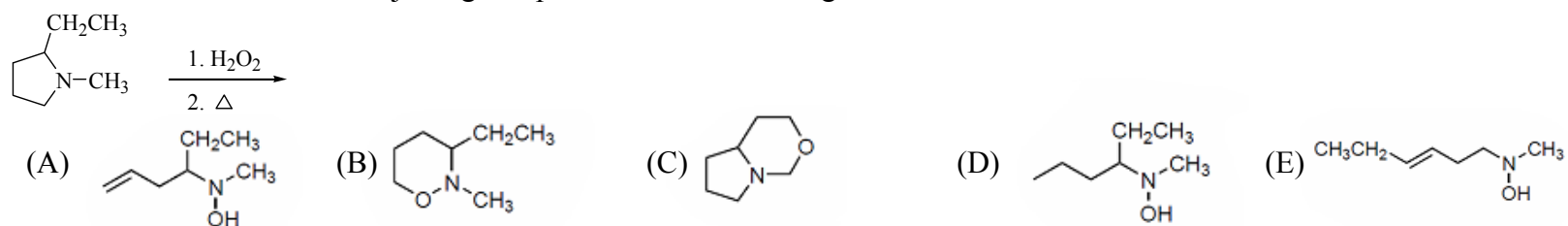
II. Choose one correct answer for the following questions

【單選題】每題 2 分，共計 40 分，答錯 1 題倒扣 0.5 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

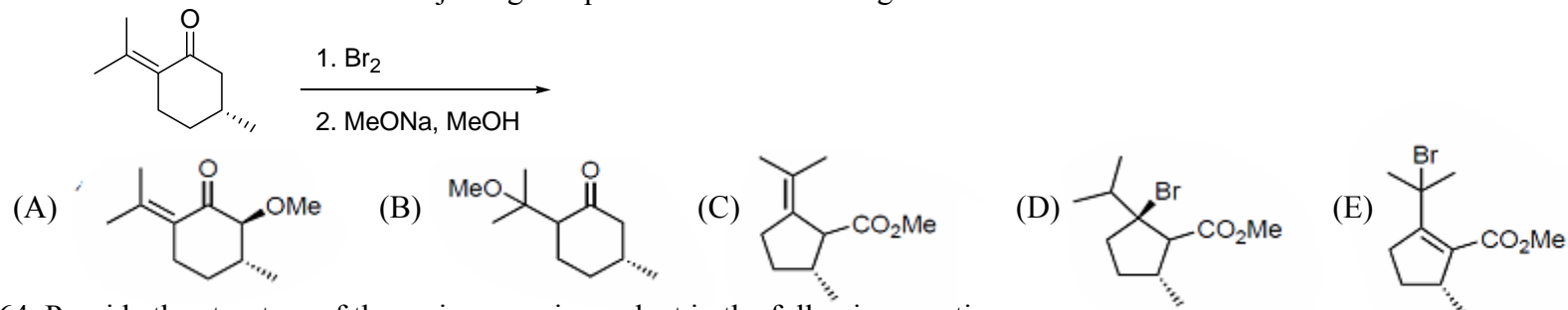
61. Provide the structure of the major organic product in the following reaction.



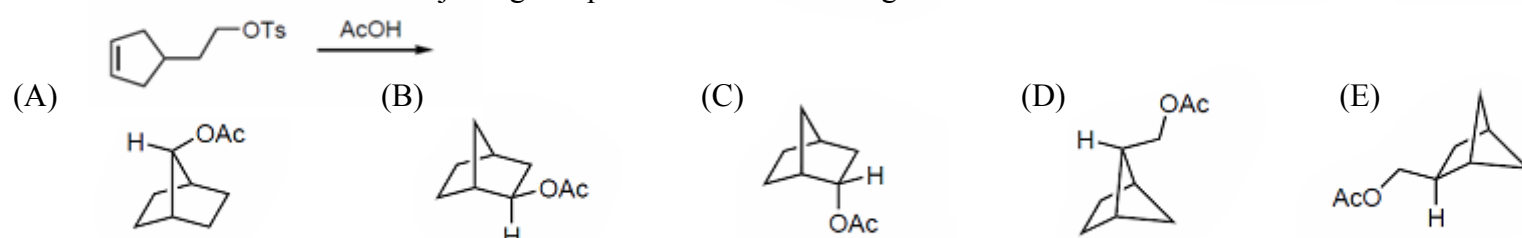
62. Provide the structure of the major organic product in the following reaction.



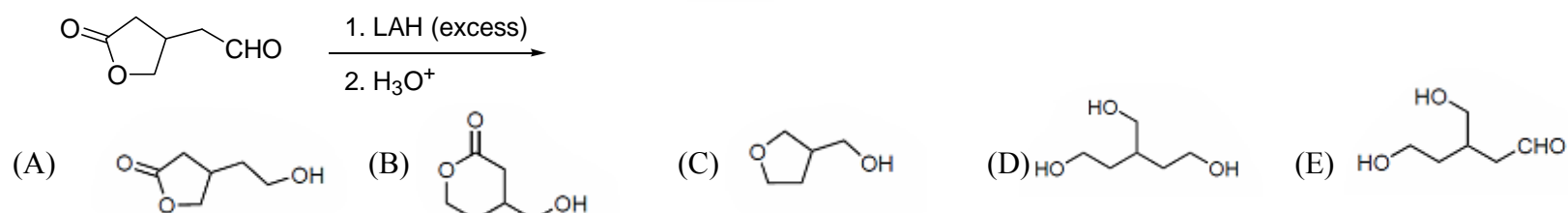
63. Provide the structure of the major organic product in the following reaction.



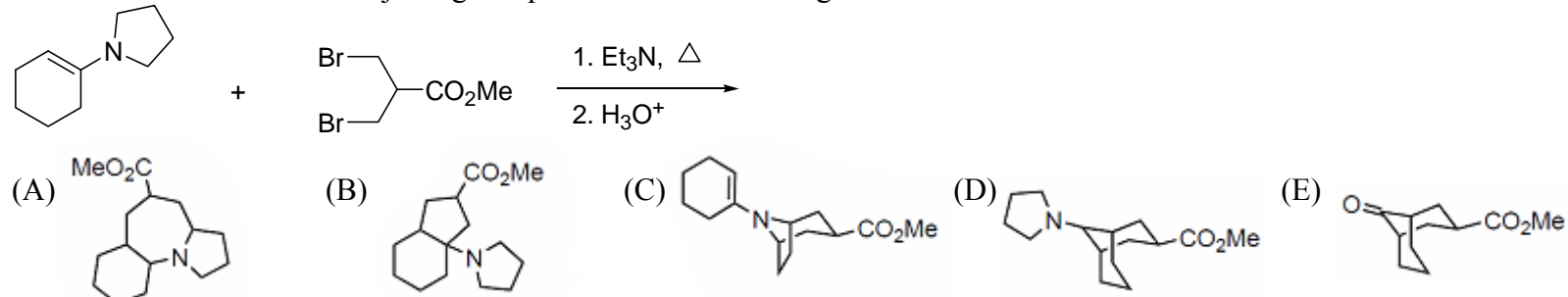
64. Provide the structure of the major organic product in the following reaction.



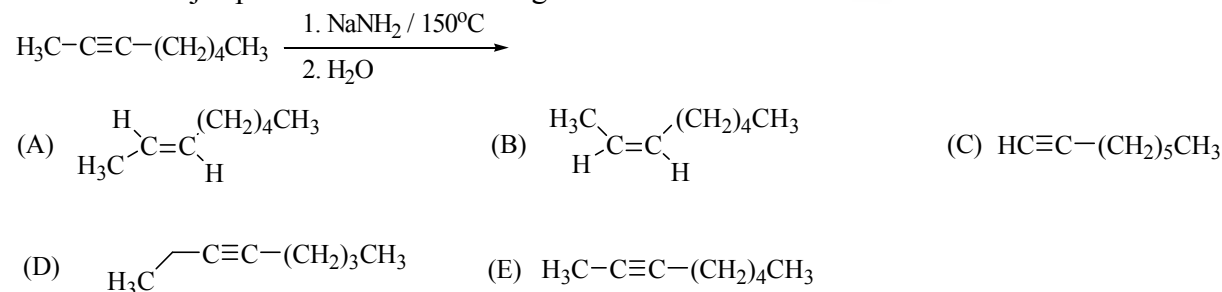
65. Provide the structure of the major organic product in the reaction below.



66. Provide the structure of the major organic product in the following reaction.



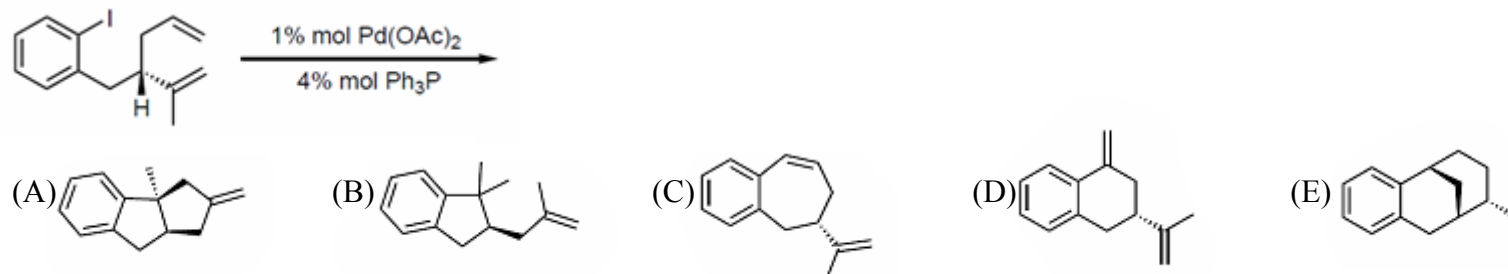
67. What is the major product of the following reaction?



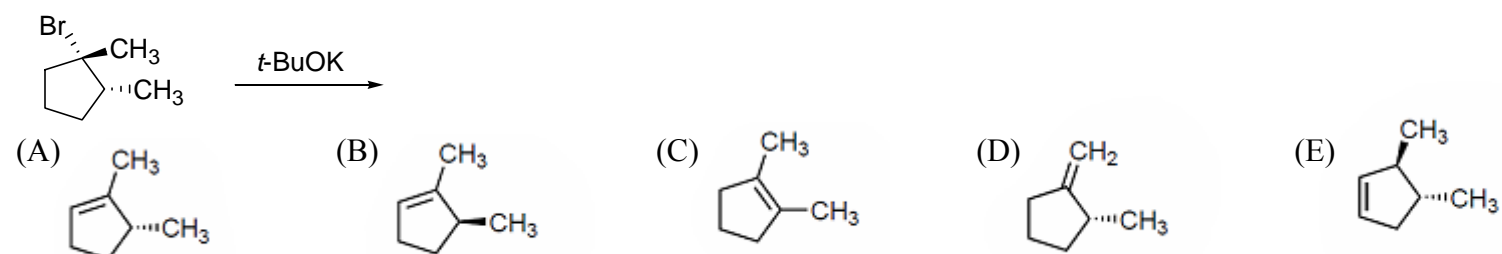
68. What is the major organic product resulted from tetrahydrofuran being reacted with excess HBr?

- (A) 1,2-dibromobutane
 (B) 1,3-dibromobutane
 (C) 1,4-dibromobutane
 (D) 4-bromobutan-1-ol
 (E) 3-bromobutan-1-ol

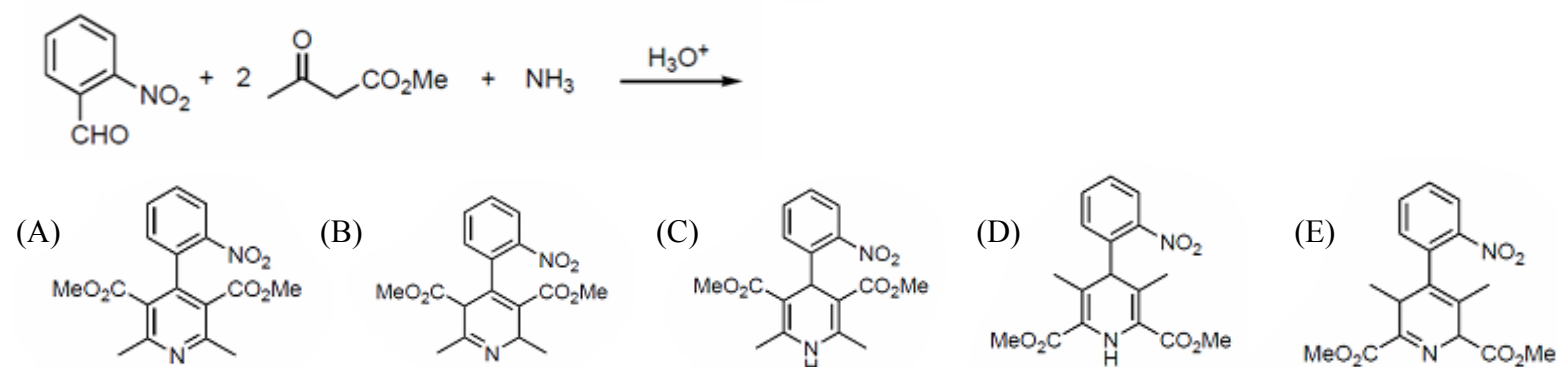
69. Provide the structure of the major organic product in the following reaction.



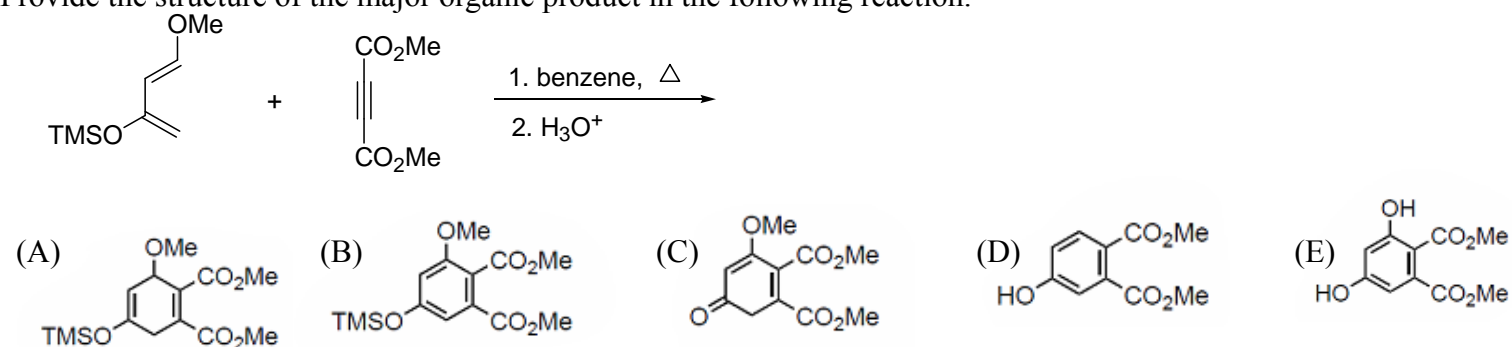
70. Identify the major product of the reaction below.



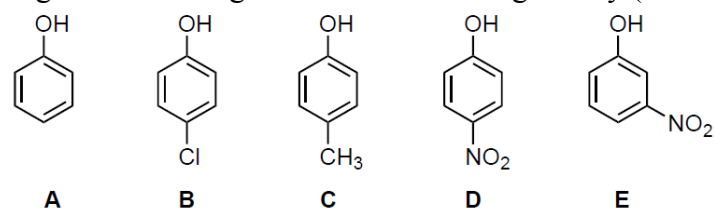
71. Provide the structure of the major organic product in the following reaction.



72. Provide the structure of the major organic product in the following reaction.



73. Arrange the following in order of increasing acidity (least acidic first).

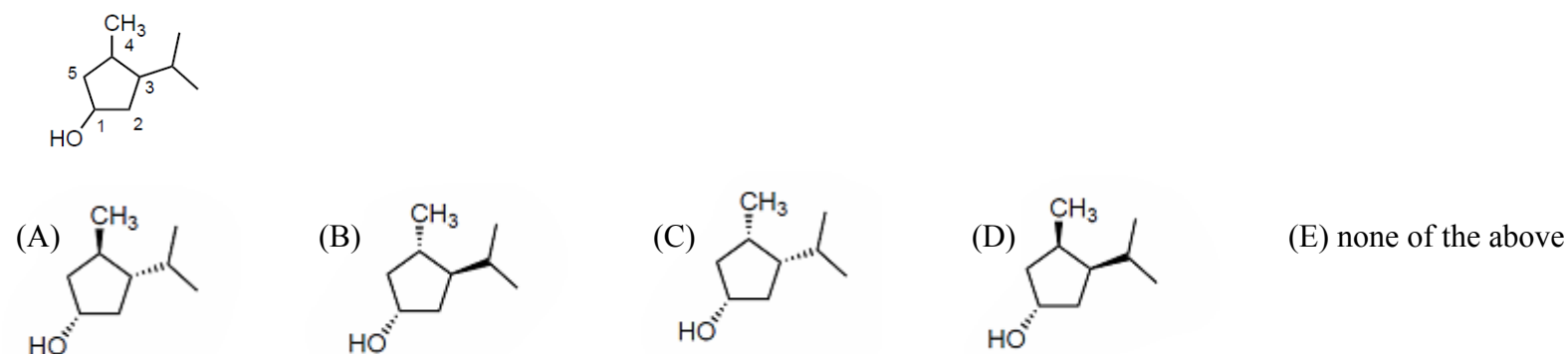


(A) $B < C < A < D < E$
(D) $E < C < A < B < D$

(B) $C < A < B < E < D$
(E) none of these

(C) $C < A < E < B < D$

74. Based on the structure shown below, choose the stereoisomer having a configuration of (1R,3S,4S) in a perspective structure.



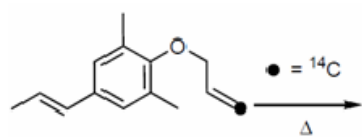
75. Deduce the identity of the compound from the data provided.

$\text{C}_8\text{H}_{13}\text{Br}$, $^1\text{H NMR}$ δ (splitting, integral): 3.5 (t, 2H), 1.8 (t, 2H), 0.9 (s, 9H); $^{13}\text{C NMR}$: 6 signals.

(A) 5-bromo-2,2-dimethylhex-3-yne
(C) 3-bromo-1,2-dimethylcyclohexene
(E) 1-bromo-5,5-dimethylhex-3-yne

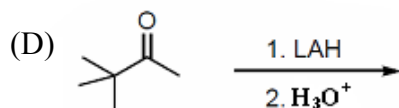
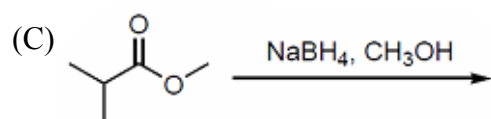
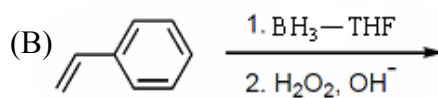
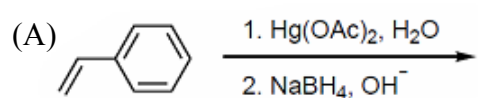
(B) 6-bromo-4,4-dimethylhex-1-yne
(D) 4-bromo-1,2,4-trimethylcyclopentene

76. Provide the structure of the major organic product in the following reaction.



- (A) (B) (C) (D) (E) none of these

77. Which of the following reactions will result in the formation of a secondary alcohol(s) in good yield?



(E) both (A) and (D)

78. Arrange the following reactions in order for preparing 1,4-diaminobutane from cyclohexene.

I. NH_3 II. $\text{KMnO}_4, \text{H}_3\text{O}^+$ III. $\text{Br}_2, \text{NaOH}/\text{H}_2\text{O}$ IV. SOCl_2

(A) I \rightarrow IV \rightarrow II \rightarrow III

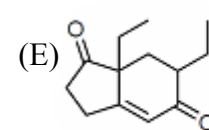
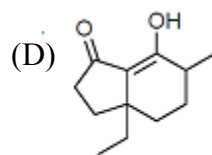
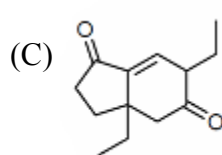
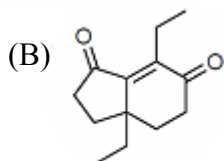
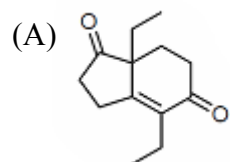
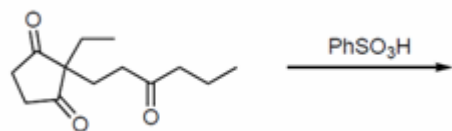
(B) II \rightarrow III \rightarrow I \rightarrow IV

(C) IV \rightarrow II \rightarrow III \rightarrow I

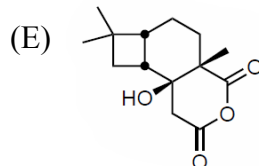
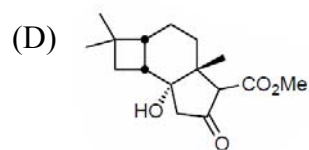
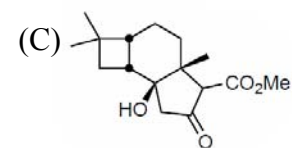
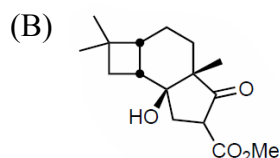
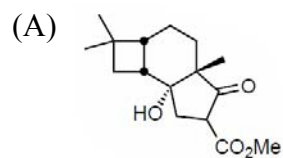
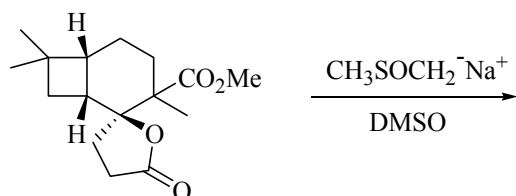
(D) II \rightarrow IV \rightarrow I \rightarrow III

(E) none of these

79. Provide the structure of the major organic product in the following reaction.



80. Provide the structure of the major organic product in the following reaction.



後醫-英文

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

後醫-有機化學

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
答案	A	A	B	E	A	D	B	A	C	E	D	E	C	A	B	D	E	A	C	B	B	E	A	E	D
題號	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
答案	C	B	D	D	E	A	B	C	E	D	E	B	D	C	A	D	B	C	E	A	B	E	A	C	D
題號	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
答案	D	B	C	E	D	B	E	E	B	C	E	A	C	B	D	E	C	C	A	D	C	D	B	C	E
題號	76	77	78	79	80																				
答案	C	E	D	A	B																				

後醫-普通生物學

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
答案	D	C	E	B	B	D	D	C	A	C	E	E	D	B	E	C	D	D	B	A	D	E	A	E	B
題號	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
答案	C	B	C	D	D	A	C	D	C	C	D	C	B	D	D	E	A	B	B	A	C	D	D	D	B
題號	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
答案	B	B	E	B	C	B	B	B	E	C	D	D	A	D	B	D	C	E	D	C	D	C	C	C	E