

**Part I. Question 1 to 10, please choose the answer closest to the underlined word or phrase. One Answer Only. 2 points each.**

1. Leaders of the world's largest economies are close to an agreement to tackle the global financial crisis.  
(A) fight (B) meditate (C) forbid (D) deal with
2. I think people realize the economy seemingly fell off the cliff.  
(A) inclined (B) caught up (C) help up (D) slumped
3. In the future, globalization is going to be increasingly driven quickly to its processes and technologies, and start to march forward.  
(A) directed (B) motivated (C) forced (D) manipulated
4. The home team kicked off the season with an easy win.  
(A) interrupted (B) commenced (C) avoided (D) complicated
5. The use of stem cells is controversial - opponents object on the grounds that it is unethical to destroy embryos in the name of science.  
(A) adversaries (B) allies (C) forerunners (D) associates
6. Slumdog Millionaire is about a Mumbai teen who grew up in the slums, becomes a contestant on the Indian version of "Who Wants To Be A Millionaire?"  
(A) asylum seeker (B) gangster (C) youngster (D) homeless
7. Critical listening is a difficult kind of listening because it requires you to both interpret and evaluate the message.  
(A) understand (B) integrate (C) intrigue (D) compose
8. He is worried about a potential quiz tomorrow.  
(A) possible (B) actual (C) providential (D) surprising
9. These two girls prefer to have intimate conversation one-on-one  
(A) personal (B) secret (C) intelligent (D) discreet
10. His position was contrary to that of the teacher's  
(A) puzzling (B) opposite (C) compatible (D) foreseeable

**Part II. Question 11-15, please choose the answer that best completes the sentence. Question 16-20, please choose the best answer to fill each of the numbered blanks in the passage.**

In many countries, it is considered 11 to appear naked or even half-naked on a public beach. However, some places often have a few 12 beaches that are designated as nudist or "clothing optional" beaches, where uninhibited people can fully 13 themselves to the sun. Other countries, especially those where 14 are hot and attitudes are 15, impose no restrictions at all, so people may sunbathe topless or nude even on the public beaches.

11. (A) inappropriate (B) interesting (C) conservative (D) considerate
12. (A) inclusive (B) executive (C) secluded (D) acceptable
13. (A) demonstrate (B) expose (C) lie down (D) externalize
14. (A) seawater (B) cuisine (C) fashion (D) climates
15. (A) strict (B) sincere (C) liberal (D) general

There are many different forms of potential economic stimulus and they work in different ways. Tax cuts for individuals generally encourage short-term spending. Tax cuts for companies encourage both spending and investment. Expenditures on public works create contracts for firms and provide short- to medium-term 16. Investments in research and development take a longer-term approach 17 the theory 18 in the future (and thus provide jobs) if they have the money to make intelligent investments in their operations

now. Finally, some forms of economic stimulus seek to make investments that will pay off in the long run 19 for everybody. An example is investing in the U.S. energy grid. 20, a one-time outlay could make energy costs for both individuals and businesses less expensive for decades to come.

16. (A) opportunities of employment (B) employment opportunities  
(C) employing opportunities (D) employment in opportunities
17. (A) under (B) in (C) of (D) on
18. (A) business is going to be thrive (B) which business is going to be thrive  
(C) that business will thrive (D) business thrives
19. (A) with cheaper consumption (B) in making cheaper consumption  
(C) by consuming cheaply (D) by making consumption cheaper
20. (A) Theoretic concern (B) Theoretical (C) Being theoretic (D) Theoretically

**Part III. Reading Comprehension. In this part, you will read several passages. Each one is followed by one question or a number of questions. Question 21 – 40, you should choose the ONE best answer to each question. 2 points Each.**

**Question 21-25**

The importance of strength in many sports is undeniable. It is so important that many university and professional teams now hire a specialized coach who only attends to the development of strength in athletes. It is interesting to note that no such specialist is hired to attend to the other components of physical fitness. We have yet to see a cardiovascular coach, a coach who attends to developing fitness of the heart and blood vessels, hired by universities or professional teams. This situation raises the question of the relative importance of each of these two components, strength training and cardiovascular training, to the other. Does the strength coach develop the cardiovascular system by prescribing a program to increase muscle fiber?

It is theoretically possible to design a weight-lifting program in which the resistance is so low and the repetitions so numerous that it provides the cardiovascular benefits of a running program. Therefore, if you view weights as a way to overload muscles, you can imagine a continuum of programs that emphasize cardiovascular benefits on the one extreme and strength on the other. The practical truth of the matter is that most coaches are primarily concerned with pure strength. Therefore, the athlete has to work on the end of the weight-overload continuum that promotes little, if any, cardiovascular benefit. In fact, one study has found that a high-intensity strength program reduced mitochondrial density (density of the cellular structures that produce energy in the muscle fiber) per unit of muscle. The athletes increased muscle mass, so they did not eliminate mitochondria presumably, but the fact remains that the oxidative capacity, the ability to use oxygen in the synthesis of energy, was not promoted. Oxidative capacity would usually improve in programs that stress cardiovascular conditioning. Neither increased blood flow nor increased mitochondrial density (both indicators of oxygen extraction) occur with strength training.

Obviously, there is nothing wrong with training athletes to gain strength, but in most strength programs cardiovascular improvements are not made. Therefore, for athletes, who require both strength and cardiovascular conditioning, both components must be trained independently.

21. What is the main point of the passage?
- (A) College and professional teams do not need specialized coaches.  
(B) Strength training should be replaced by cardiovascular training.  
(C) Cardiovascular training is more difficult than strength training.  
(D) Athletes need both strength and cardiovascular training.

22. Under which of the following conditions can a weight-lifting program provide cardiovascular benefits?
- (A) When the weights are very heavy
  - (B) When the weights are lifted very slowly
  - (C) When lifting a heavy weight overtires the muscles
  - (D) When light weights are lifted a large number of times
23. Why does the author mention running?
- (A) To give an example of the benefits of strength training
  - (B) To demonstrate what a typical weight program includes
  - (C) To give an example of an activity that provides cardiovascular conditioning
  - (D) To demonstrate the importance of oxygen extraction
24. Which of the following is an important direct result of cardiovascular training?
- (A) Improved oxidative capacity
  - (B) Increased muscle fiber
  - (C) Decreased mitochondrial density
  - (D) Increased body weight
25. Which of the following policies would the author be most likely to support?
- (A) Sports teams should increase their strength-training programs.
  - (B) All athletes should be able to choose the kinds of training they prefer.
  - (C) Sports teams should provide improved cardiovascular training.
  - (D) All athletes should avoid strength training in order to avoid injury.

**Question 26-31**

It is in search of adequate food supplies that cetaceans, marine mammals such as whales and dolphins, travel the oceans. They live in a world that is largely hidden from humans. Yet their range is three times as large as ours, since oceans occupy about three-quarters of the Earth's surface. They travel through well-marked ocean zones, **each** with its own characteristic marine life. They glide through the water, periodically rising to the surface to breathe. The sea may be raging but cetaceans are untroubled by the greatest storms; indeed they are more at home in rough than in calm seas.

Indirectly, however, their life is greatly influenced by wind. The eastward rotation of the Earth produces the **prevailing** trade winds, blowing east to west at the equator. These winds drag the surface waters and all they contain in a westerly direction. Warmed by its passage through the tropics, the wind-driven water is deflected against the westward continents, turning southwest in the Southern Hemisphere and northwest in the Northern Hemisphere.

In the Southern Hemisphere, the warm flow of tropical water under the west-going equatorial trade wind produces a genial climate along the eastern shores of Australia, South America, and South Africa. But there is open ocean to the south. Here the current is driven eastward unimpeded by land before the almost incessant westerly gales of this zone. The huge mass of water moves fast, chilled by water from the Antarctic Region, but **laden** with masses of plankton.

This cold, swift current is **split** when it strikes the southwestern extremities of the three southern continents. The northern portion of this water is diverted by the southwest coast of South America to sweep northward toward the equator. Known as the Humboldt Current, this current is rich in plankton on which cetaceans feed. Part of this same cool eastward-flowing current, enriched with water from higher latitudes, is similarly diverted north along the southwest coast of South Africa. This is the Benguela Current, where many cetaceans come to feed.

26. The passage answers which of the following questions?
- (A) What is the main difference between cetaceans and other marine life?

- (B) How far do most cetaceans travel in a year?  
(C) How often do cetaceans need to breathe?  
(D) What winds and ocean currents affect cetaceans?
27. The word **each** in paragraph 1 refers to a  
(A) cetacean (B) surface (C) range (D) zone
28. The word **prevailing** in the passage is closest in meaning to  
(A) arctic (B) blowing (C) dominant (D) energetic
29. The word **laden** in paragraph 3 is closest in meaning to  
(A) balanced (B) filled (C) touched (D) wrapped
30. The word **split** in paragraph 4 is closest in meaning to  
(A) stopped (B) divided (C) opened (D) surrounded
31. What do paragraphs 3 and 4 primarily discuss?  
(A) The water currents in the Southern Hemisphere  
(B) The trade winds in the Southern Hemisphere  
(C) The three continents in the Southern Hemisphere  
(D) The large area of open ocean in the Southern Hemisphere.

**Question 32-36**

Doris Lessing received her Nobel Prize in 2007. Her novel *The Golden Notebook* is considered a feminist classic by some scholars, but notably not by the author herself, who later wrote that its theme of mental breakdowns as a means of healing and freeing one's self from illusions had been overlooked by critics. She also regretted that critics failed to appreciate the exceptional structure of the novel. As she explains in *Walking in the Shade*, Lessing modeled Molly, to an extent, on her good friend Joan Rodker, the daughter of the author and publisher John Rodker.

Lessing does not like the idea of being pigeon-holed as a feminist author. When asked why, she replies:

What the feminists want of me is something they haven't examined because it comes from religion. They want me to bear witness. What they would really like me to say is, 'Ha, sisters, I stand with you side by side in your struggle toward the golden dawn where all those beastly men are no more.' Do they really want people to make oversimplified statements about men and women? In fact, they do. I've come with great regret to this conclusion.

- Doris Lessing, *The New York Times*, 25 July, 1982[8]

32. Doris Lessing is a Nobel Prize winner in  
(A) Feminism. (B) Literature. (C) Sociology. (D) Peace.
33. According to Doris, what feminists want from her is  
(A) exceptional structure. (B) fighting against men.  
(C) creative ideas about men and women. (D) healing power from battles between men and women.
34. Doris Lessing does not particularly like the idea of being **pigeon-holed** as a feminist; pigeon-holed here means  
(A) categorized (B) wholesale (C) viewed (D) completed
35. Which of the following statements is **FALSE**?  
(A) Critics often neglect the theme of mental breakdowns as a self-freeing power.  
(B) She models a heroine on her friend in one of her books.  
(C) Her book *The Golden Book* is particularly considered a feminist one by Lessing.  
(D) Lessing thinks critics understand her work very well.
36. Generally speaking, Lessing's attitude towards being considered a feminist is  
(A) accepting (B) disappointed (C) welcomed (D) patient

**Question 37-40**

In recent years, many Taiwanese have won awards at international film festivals. However, many theater owners don't consider even prize-winning Taiwanese films to have much commercial potential in their home market. Their viewpoint is generally confirmed by the largely empty seats at showings of locally produced movies. The market share for local films is only about two percent, while more than 95 percent of the market is taken by Hollywood blockbusters. The dominance of American-made films in Taiwan has continued for the past ten years, but the government is proposing some solutions. It is hoped that some legal changes and few promotional projects will help Taiwan's struggling film industry.

One proposal is to give individuals or companies a tax deduction for money spent to produce a film. The idea is that the tax deduction would encourage investments in new films. There are also plans to provide financial support not only for film production, but also for marketing.

37. Which of the following could be a title for this passage?

- (A) The international Movie Industry and Taiwanese Films
- (B) Trends in Taiwanese Moviegoing Habits
- (C) Prize-Winning Taiwanese Films
- (D) A Helping Hand for the Taiwanese Film Industry

38. Which of the following statements is true about Taiwanese films in general?

- (A) They have been commercially successful both locally and abroad.
- (B) Most production of local films has been moved to Hollywood.
- (C) They have won many international awards, but little response from local audiences.
- (D) They have found little success anywhere in the world.

39. What does the passage imply is the main reason that Taiwanese films do not have a large local audience?

- (A) Taiwanese audiences dislike prize-winning films, thinking them "arty."
- (B) American films are superior in quality.
- (C) The Taiwanese film industry is not supported well enough financially.
- (D) Ticket prices for local films are too high.

40. How is the government attempting to help the local film industry?

- (A) By limiting the number of foreign films that local theater owners can show.
- (B) By encourage lower ticket prices for local films.
- (C) By establishing schools for training local filmmaking talent.
- (D) By helping to make creating and promoting local films more affordable.

**Part IV. Essay. 20 points.**

**Do you think that technology alienate people from one another? Why or Why not? Please write a well-structured essay in 150 to 200 words discussing your opinions.**

單選題 (每題 2.5 分) 請在答案卡上作答

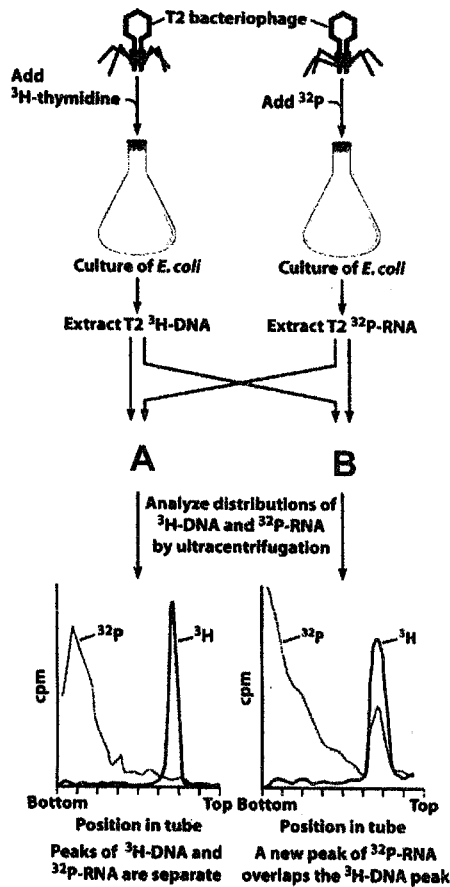
1. Gregor Mendel had begun breeding experiments by mating parents with specific traits to work out principles of characteristic transmission from parents into offspring. From today point of view, **law of segregation** is due to A) mitosis by gamete formation B) meiosis by gamete formation C) cell division D) gamete maturation E) none of the above.
2. From modern view, **law of independent assortment** is just because of A) two genes located at same chromosome B) two chromosome crossover C) the homologous pairing D) the homologous chromosome separation E) two genes locate at different chromosomes.
3. In trying to determine whether DNA or protein was the genetic material, the scientists have used  $^{32}\text{P}$  and  $^{35}\text{S}$  radioisotope to label the phages for their experiment. The rationale for this design is a)  $^{35}\text{S}$  label RNA and  $^{32}\text{P}$  label DNA b)  $^{35}\text{S}$  label protein and  $^{32}\text{P}$  label DNA c)  $^{35}\text{S}$  label protein coat and  $^{32}\text{P}$  label capsid d)  $^{35}\text{S}$  and  $^{32}\text{P}$  have different density e)  $^{35}\text{S}$  and  $^{32}\text{P}$  labeled materials can be separated into different fractions.
4. In 1940, George Beadle and Edward Tatum experiment suggested that the synthesis of cellular components typically occurs via biochemical pathways involving A) a series of small steps, each catalyzed by an enzyme. B) a single enzymatic reaction. C) the simultaneous activity of several enzymes. D) the simultaneous synthesis of all intermediate molecules. E) the accumulation of a blocked intermediate in the pathway.

Use the following background information for the next three questions.

Ben Hall and Sol Spiegelman performed a classic experiment (the following figure): E. coli cells were infected with T2 phage; T2 DNA was labeled with  $^3\text{H}$ -thymidine and the newly synthesized RNA was labeled with  $^{32}\text{P}$ .

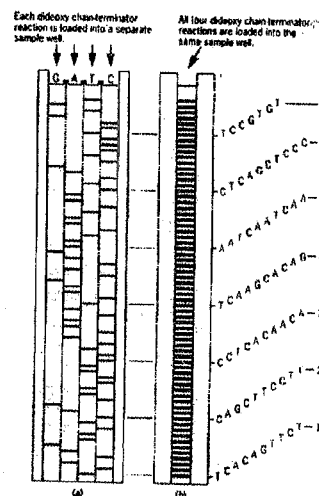
5. Based on the following figure, what they did in step A? A) Denature RNA and mix with DNA B) just simply mix DNA with RNA C) Denature DNA, mix and cool slowly to allow DNA-RNA hybridization D) Denature DNA, mix and cool slowly to allow DNA-DNA reannealed E) Denature RNA, mix and cool slowly to allow DNA-RNA hybridization.
6. Based on the following figure, what they did in step B? A) Denature RNA and mix with DNA B) just simply mix DNA with RNA C) Denature DNA, mix and cool slowly to allow DNA-RNA hybridization D) Denature DNA, mix and cool slowly to allow DNA-DNA reannealed E) Denature RNA, mix and cool slowly to allow DNA-RNA hybridization.
7. What did they find in this experiment? A) tRNA B) rRNA C) mRNA D) plasmid

E) transposon.



8. What is the role of aminoacyl-tRNA synthetase in translation?
  - A) It brings together two subunits of a ribosome.
  - B) It catalyzes peptidyl transferase activity.
  - C) It helps fold up the finished polypeptide chain.
  - D) It couples an amino acid with tRNA
  - E) It binds to an mRNA codon and carries the corresponding amino acid.
9. A mutation causes a G to be inserted after the first base of the codon for tryptophan. How will this affect the growing polypeptide chain?
  - A) It will not be affected.
  - B) Protein synthesis will stop prematurely.
  - C) There will be a single amino acid substitution.
  - D) The reading frame will be shifted to the left, and the wrong amino acids will be added from this point on.
  - E) None of the above
10. The **Shine-Dalgarno** sequence is the polypurine sequence AGGAGG centered about 10 bp before the AUG initiation codon on bacterial mRNA. It is responsible for
  - A) RNA polymerase to bind,
  - B) DNA polymerase to bind,
  - C) large ribosomal subunit to recognize,
  - D) small ribosome subunit to recognize
  - E) termination.
11. Eukaryotic protein-coding genes contain both \_\_\_\_\_ and \_\_\_\_\_.
  - A) enhancer
  - B) promoter
  - C) repressor
  - D) A and B
  - E) A, B, and C
12. Gel electrophoresis separates DNA molecules on the basis of \_\_\_\_\_.
  - A) the amount of adenine they contain relative to the amount of guanine they contain
  - B)

- the nucleotide sequence of their sticky ends C) their nucleotide sequences D) the amount of adenine they contain relative to the amount of thymine they contain E) their lengths
13. When an enhancer element is bound by a positive regulatory protein, the result is  
A) activation of replication. B) activation of transcription. C) activation of translation. D) repression of replication. E) repression of transcription.
  14. Gene cloning of eukaryotic cells will be started from a) mRNA b) DNA c) tRNA d) rRNA e) protein.
  15. Which of the following strategy is most used to select the transformed *E. coli*? A) nutrition B) replication origin C) antibiotic resistance D) color E) temperature
  16. If you like to clone a DNA fragment bigger than 200 kb, which of the following vector can be used? A) yeast artificial chromosome B)  $\lambda$  phage C) plasmid D) cosmid E) p1 phage.
  17. A typical PCR process requires a number of cycles for amplifying a specific DNA sequence. Each cycle has three successive steps: 1) Denaturation, 2) Renaturation, 3) Synthesis. What is the purpose for doing **renaturation**? A) template DNA renature, B) optimize the reaction condition, C) increase specificity, D) the primers pair with their complementary sequences in the template, E) activation of *Taq* DNA polymerase.
  18. In the following figure, the transition from (a) to (b) represents the big improvement of DNA sequencing technology. In (a) reaction, each dideoxynucleoside triphosphate is labeled by  $P^{32}$  radioisotope. How to label the dideoxynucleoside triphosphates in (b) reaction? A) by different radioisotope B) by using same labeling but changing detection system C) by using four different analogs of dideoxynucleoside triphosphates D) by using  $C^{14}$  to label E) by labeling with a different fluorescent dye





19. Just following the previous question (#39), how many fluorescent dyes are needed in (b) reaction? A) 1 B) 2 C) 3 D) 4 E) 5.
20. Which one of the following was not a key stage in the mapping of the human genome? A) phage detection B) the creation of genetic linkage maps C) physical mapping of the genome D) DNA sequencing E) All of the choices were key stages in the mapping of the human genome.
21. Which of the following areas of research will benefit from the human genome project? A) understanding human embryonic development B) improving the diagnosis, treatment, and prevention of heart disease, cancer, and other common ailments. C) understanding human evolution D) All of the above are correct. E) None of the choices are correct.
22. What is the biggest technical challenge for human genome sequencing? A) Sequencing the coding region B) Assembling the sequence around the highly long repeat region C) Sequencing the repeat region D) Assembling the gene with its regulatory region E) all of the above are correct
23. Which of the following can be used as markers for human genome mapping A) Restriction fragment length polymorphisms (RFLP) B) simple sequence repeat (SSR) C) single nucleotide polymorphisms (SNP) D) sequence-tagged sites (STS) E) all the above are correct
24. In 1998, Craig Venter formed Celera Genomics to sequence whole human genome by using A) shotgun strategy B) Map-based C) PCR D) EST E) all the above are not correct
25. In 1980, Russell Doolittle built up the first database for biological researchers. His database contains A) many gene DNA sequences B) RFLP sites in mouse genome C) many partial and full-length protein sequences D) oncogene sequences E) several different tumor types
26. The conservative regions in different genomes include A) genes B) regulatory regions for gene expression C) transposons D) A, B and C E) A and B
27. The human genome is composed of approximately 60% A:T base pairs, so that the probability of an A (or T) at any given location is 0.3, and G or C is 0.2. How many copies of GATTACA sequence might appear in the human genome? (human genome contains  $3 \times 10^9$  bp) A) 200,000 B) 300,000 C) 400,000 D) 500,000 E) 600,000
28. The scoring system of pair protein alignment is based on A) the identical amino acids B) the identical nucleotides C) the similar function of amino acids D) A and B E) A and C
29. Approximately what percentage of human DNA is noncoding? A) 37% B) 79% C) 99.9% D) 97% E) 49%

30. Which one of the following statements is **false** in comparison of the mouse and human genomes? A) The vast majority (>95%) of the human genome appears to have drifted, which suggests that these segments are not functionally important B) The remaining 5% is under evolutionary constraint, which indicates that only a small portion of our genome codes for important functions C) 1.2% codes for protein exons, 3.8% might be important for transcriptional regulation, and DNA replication and other regulatory processes D) The number of proteins in human and mouse is fewer than the number of human genes E) 1.2% codes for protein exons of the mouse and human genomes are relatively conservative.
31. So far, all the genes have been knocked out in A) yeast B) mouse C) rabbit D) human E) monkey
32. The yeast two-hybridization is applied to identify A) protein-DNA interaction B) protein-protein interaction C) protein-RNA interaction D) the metabolism rate E) the respiration rate
33. Chromatin immunoprecipitation is used to measure A) protein-DNA interaction B) protein-protein interaction C) protein-RNA interaction D) the metabolism rate E) the respiration rate
34. Mass spectrometry is an analytical tool used for measuring the **molecular mass** of a sample. The sample has to be introduced into the ionisation source of the instrument. Once inside the ionisation source, the sample molecules are ionised, because ions are easier to manipulate than neutral molecules. These ions are extracted into the analyser region of the mass spectrometer where they are separated according to their mass (m) -to-charge (z) ratios (m/z). A) false B) true
35. The basic principle that microarray gene expression can reveal relationships between biochemical and cellular pathways is A) the function of protein relate to cellular activity B) the function of lipids relate to cellular activity C) expression of mRNA might corresponding to cellular physiologic condition D) the function of carbohydrate relate to cellular activity E) all of the above are not correct
36. The biggest advantage of Affymetrix technology, which puts the gene spots on the chips for every gene containing 22 different (11 correct, and 11 with a mutation at nucleotide number 13) oligonucleotides of 25-mer, is A) easily to manipulate B) easily to analysis C) increasing specificity D) increasing affinity E) decreasing the expense
37. Hierarchical clustering is the most popular analysis method for gene expression profile of microarray. It is just simply based on a parameter to cluster the genes together. What is this parameter? A) gene name B) gene function C) gene evolution D) the amount of gene expression E) none of the above.
38. The reporter gene assay is used for studying A) protein expression B) DNA

replication C) transcription regulation D) protein modification E) RNA processing

**Refer to the following information for the next 2 questions**

The yeast genome contains about 6,000 genes. All of them have been knocked out to analyze their functions, revealing that 1,500 genes are essential for survival and another 4,500 genes are not lethal.

39. You like to use these non-lethal strains to discover the genes that involve in the synthesis of leucine. Describe your method to identify these genes. What is your strategy to identify these genes? A) You screen yeast strains that can not grow in the medium without leucine from 2,500 non-lethal strains. B) You screen yeast strains that can not grow in the medium with leucine from 4,500 non-lethal strains. C) You screen yeast strains that can grow in the medium without leucine from 4,500 non-lethal strains. D) You screen yeast strains that can not grow in the medium without leucine from 4500 non-lethal strains and 1500 lethal strains. E) You screen yeast strains that can not grow in the medium without leucine from 4500 non-lethal strains.
40. You finally screen out 5 genes. What do they represent? A) they are five genes with the same function B) they are five genes to control yeast growth in the presence of leucine C) they are five genes involved in the synthesis pathway of leucine D) they are five genes to control yeast growth in the absence of leucine E) they are meaningless.