

III SIMULAZIONE IN INGLESE

General Knowledge and Logical Reasoning

1. The seas around the UK have become so noisy that whales are having to sing louder to make themselves heard above the din created by ships, wind farms and oil exploration. With whale numbers severely depleted, the ability to communicate over long distances could be key to their finding a mate. According to a study by marine biologists, around the coast of the UK whale song is now ten times louder than it was fifty years ago, and also higher pitched. Whales are trying to adapt to increased man made noise either by emitting much louder noises or by calling at higher frequencies. Their messages are getting simpler and repeated more often, like a person being forced to shout.

Which of the following can be drawn as a conclusion from the passage above?

- A. The noise of modern human life will eventually cause whales to become extinct.
- B. Sea-based wind farms should not be built because of the danger to whales.
- C. Whales will be able to adapt their communication methods to overcome the problem of human noise.
- D. The depletion of whale numbers is caused by the growth of human noise.
- E. None of the above.

2. I am planning to visit a resort for my holiday this summer. There are three options for my accommodation: a single room which costs \$70 per night, a deluxe room which costs \$80 per night or a suite which costs \$95 per night. The prices include meals, but it is possible to opt out from the meals by paying \$15 less per night. The resort offers a taxi service from the airport at a cost of \$10. Alternatively, it is possible to hire a car at the airport which can be used for the whole stay. This option costs \$5, plus an additional \$5 per night.

I want to stay for six nights in a deluxe room, but I don't want my meals included in the price that I pay. I also want to hire a car for the duration of the stay.

What will be the total cost of my stay?

- A. \$365
- B. \$390
- C. \$425
- D. \$435
- E. \$480

3. When children are young they often play games. These games are useful as they teach children how to interact with each other. In recent years the growth of computer games has meant that now many children play most of their games on computers and across the internet. Thus the way in which children interact with each other has changed. When these children grow up they will need to work in jobs that require interaction with co-workers. The increased popularity of computer games is therefore going to mean that they are less likely to be able to function socially within their workplace.

Which one of the following is a flaw in the above argument?

- A. It ignores the benefits that are brought by the internet, such as easy access to more information.
- B. It does not consider that games on a computer can teach many other skills as it is possible for their rules to be more complex.

- C. It does not consider the fact that adults also play computer games.
- D. It is restricted to just one negative aspect of computer games.
- E. It does not establish that children who play computer games no longer interact with each other.

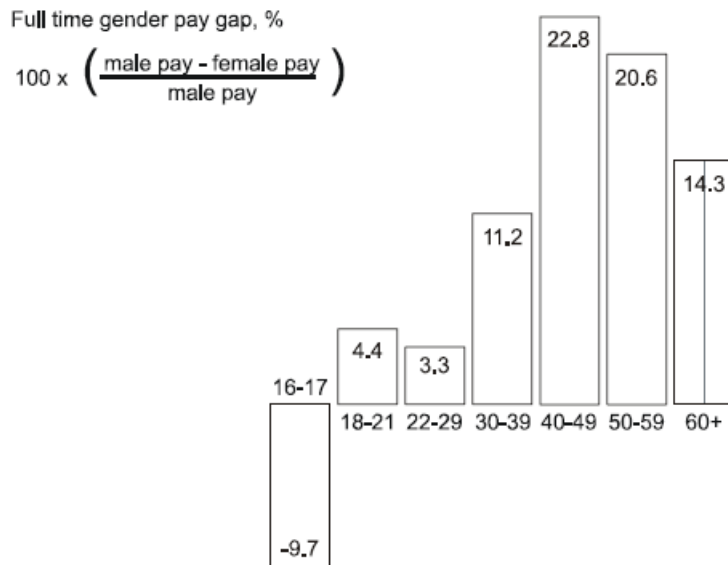
4. Becoming a London taxi driver isn't as easy as you may think. Unlike other London folk who choose to take the tube or bus, taxi drivers have to spend hours learning the city's road network for a face-to-face exam at the Public Carriage Office to get a licence to start their careers. Recent brain scans on a group of taxi drivers revealed that areas of their brains associated with memory were more developed than would be normal for the general population. So all that learning not only makes them money, but also increases their memory power. Which one of the following is an assumption made in the above argument?

- A. People who have a poor memory do not become taxi drivers.
- B. Many people believe that it is easy to become a taxi driver.
- C..
- D. People usually become taxi drivers in order to make money rather than to improve their Memory
- E. None of the above

5-8. The difference between men's and women's pay is still at unacceptable levels, according to recent TUC research. It found that from the age of 18 - and throughout the rest of their working lives - women earn less than men.

In their 20s, the pay gap for full-timers is a modest 3.3%, but in their 30s women take home 11.2% less than men. And in their 40s - the peak age for discrimination - the gap rises to 22.8%. The TUC said the undervaluing of women in the workplace was partly due to a "motherhood penalty". The long hours and intensity of senior positions deterred mothers from seeking promotions for which they were qualified. The TUC said there was direct discrimination against mothers and their choice became limited to jobs that could be combined with looking after children.

The "motherhood penalty" became even more severe for women who switched to part-time work. They were more likely to change employer or occupation, often taking jobs with lower hourly earnings. The hourly earnings of women working part-time were 23.4% less than the equivalent male rate in their 30s, and 41.2% in their 40s.



5. On the basis of the above data which one of the following is a reliable conclusion to draw?

- A. On average, men's earnings peak before they reach 50.
- B. Employers are less willing to employ women over 30 than they are to employ women under 30.
- C. The percentage difference between men's and women's pay more than trebles between the ages of 22 and 30.
- D. On average, a woman in her 40s or 50s earns less than £0.80 for every £1 earned by a man in that age range
- E. None of the above

6. Suppose the average pay for women in full-time work aged 40-49 was £16,000. Which of the following is the best approximation of the average pay for a man in the same age-range, at that time, based on the above figures?

- A. £19,700
- B. £20,300
- C. £20,700
- D. £21,300
- E. None of the above

7. Which one of the following is an assumption behind the TUC's reasoning, as reported in the third paragraph?

- A. It is mainly men who are responsible for recruiting and promoting staff.
- B. Women are less well qualified than men for senior positions which attract higher pay.
- C. Mothers would choose to take up higher positions for which they are qualified after they have started a family.
- D. Motherhood is the only reason for the pay discrimination against women.
- E. None of the above

8. Assuming that the figures in paragraph 4 for part-time pay are correct, and that they follow the same general trend as the full-time pay gap, which one of the following is most strongly supported by the data provided?

A. A woman over 60, working part-time, will earn £8.57 for every £10 earned by a man over 60 working part-time.

B. On average, a man in his 40s working part-time earns 80% more than a man working part-time in his 30s.

C. A woman working part-time in her 20s will earn more than a woman working part-time in her 30s.

D. If the average part-time pay for men in their 40s is £15 per hour, women of the same age, on average, will earn £8.82 per hour.

E. None of the above

9. The ability to use language (to communicate using symbols and words to represent objects, feelings and thoughts) separates humans from all other animals on earth. By the age of 18, humans know more than 60,000 words, which is a surprising figure when you consider the monosyllabic vocabulary used by most teenagers. From the age of six months babies begin to recognise their own language. There are genetic reasons why this form of communication is unique to humans. Humans and chimps actually share 99% of their DNA, but in 2006 researchers comparing the two species found a gene, HAR1, that makes us dramatically different. It is expressed in the human cerebral cortex, a part of the brain that is particularly associated with language.

Which one of the following pieces of evidence would strengthen the hypothesis that HAR1 explains the human language ability?

A. A chimpanzee gene is found to be 98% identical to HAR1.

B. A human genetic disorder (of specific language impairment) is found to be caused by a mutation in HAR1.

C. HAR1 is found to be expressed in parts of the human brain that are not related to communication.

D. HAR1 is expressed in the brain before birth.

E. Some chimps can be taught to communicate with symbols.

10. Employees at Grindstone Ltd are paid a weekly wage according to the following formula: £240 + £5 for every year of their age above 21 (where appropriate) + £20 for every full year of service with the company.

Jasper is 43 years old and has worked for Grindstone for 6 years. Although Ruby is 8 years younger, she earns £40 per week more than Jasper.

For how much longer than Jasper has Ruby been employed by Grindstone Ltd?

A. 2 years

B. 4 years

C. 6 years

D. 8 years

E. 10 years

11. Which of the following states is not a EU member?

- A. Latvia
- B. Croatia
- C. Malta
- D. Slovenia
- E. Norway

Biology

12. Which of the following is not true of the respiratory tract from the medium bronchi to the aveoli?

- A. Cartilage gradually decreases and disappears at the bronchioles.
- B. Resistance to air flow increases due to the increase in cross-sectional diameter.
- C. Proportionally, smooth muscle decreases uniformly.
- D. Lining of the tubes changes from ciliated columnar to simple squamous epithelium in the aveoli
- E. None of the above

13. The larynx contains _____.

- A. the thyroid cartilage
- B. a cricoid cartilage also called the Adam's apple
- C. an upper pair of avascular mucosal folds called true vocal folds
- D. lateral cartilage ridges called false vocal folds
- E. None of the above

14. The walls of the alveoli are composed of two types of cells, type I and type II. The function of type II is to _____.

- A. secrete surfactant
- B. trap dust and other debris
- C. replace mucus in the alveoli
- D. protect the lungs from bacterial invasion
- E. None of the above

15. Myoglobin _____.

- A. breaks down glycogen
- B. is a protein involved in the direct phosphorylation of ADP
- C. stores oxygen in muscle cells
- D. produces the end plate potential

E None of the above

16. Immediately following the arrival of the stimulus at a skeletal muscle cell there is a short period called the _____ period during which the events of excitation -contraction coupling occur.

A. contraction

B. relaxation

C. latent

D. refractory

E. None of above

17. Which of the following does not act as a stimulus to initiate a muscle contraction?

A. hormonal activity

B. neurotransmitters

C. a change in the pH of a muscle

D. a change of temperature

E. None of above

18. Which of the following is not a usual result of resistance exercise?

A. increase in the efficiency of the respiratory system

B. increase in the efficiency of the circulatory system

C. increase in the number of muscle cells

D. increase in the number of myofibrils within the muscle cells

E. None of the above

19. Smooth muscle is significantly different from striated muscle in several ways. Which of the following is true?

A. Smooth muscle has transverse tubules.

B. Smooth muscle is larger and more powerful than striated muscle.

C. The fibers of smooth muscle are arranged quadrangulary.

D. Smooth muscle contracts in a twisting way

E. None of the above

20. Calcium ions bind to the _____ molecule in skeletal muscle cells.

- A. actin
- B. tropomyosin
- C. troponin
- D. myosin
- E. None of the above

Chemistry

21. Which of the following statements about an sp hybridized carbon is FALSE?

- A. It is divalent.
- B. It forms bonds that are linear.
- C. It has two p orbitals.
- D. It always forms triple bonds to carbon
- E. All of the above are true

22. The correct geometry around oxygen in CH₃OCH₃ is

- A. linear.
- B. bent.
- C. Tetrahedral
- D. trigonal planar
- E. All of the above are true

23. Which of the following physical properties differ for each of a pair of enantiomers?

- A. solubility in ethanol
- B. direction of rotation of plane-polarized light
- C. boiling point and melting point
- D. index of refraction
- E. None of the above

24. Which of the following cyclohexane conformations has the MOST energy (is the LEAST stable)?

- A. chair
- B. half-chair
- C. boat
- D. twist-boat
- E. None of the above

25. Which compound has the highest melting point?

- A. decane

- B. 2,2,3,3-tetramethylbutane
- C. 2,2,3-trimethylpentane
- D. 4-methylnonane
- E. None of the above

26. Predict which of the following compounds will have a lower boiling point than 1-butanol.

- A. 1-butanol
- B. 2-butanol
- C. 1-butene
- D. butanoic acid
- E. None of the above

Physics and Mathematics

27. Find the mean of the data set {6, 8, 11, 10, 8, 7, 13}

- A. 1
- B. 2
- C. 3
- D. 4
- E. 9

28. Magnetism is similar to electricity, but different from gravity, because magnetism and electricity

- A. depend on charge
- B. can attract and repel
- C. depend on mass
- D. all three
- E. None of the above

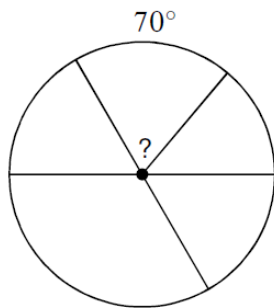
29. The magnetic field strength outside a solenoid varies

- A. inversely to the distance from the central axis, r
- B. inversely to r^2
- C. directly to r
- D. in a really complicated way
- E. None of the above

30.

Find the measure of the arc or angle indicated.

1)



- A. $1/3$
- B. $2/3$
- C. $3/4$
- D. $4/5$
- E. $7/36$