

PROVA DI AMMISSIONE AL CORSO DI LAUREA IN DENTAL HYGIENE

Anno Accademico 2026/2027

Per ogni domanda, la risposta esatta è quella evidenziata

Reading skills and knowledge acquired during studies Test

1. Read the text and respond to each question only on the basis of the information it contains explicitly or implicitly and not on what you already know about the topic.

NASA is testing a new "inflatable shield" designed to make landings on other planets—and re-entries to Earth—safer. The device, about six meters in diameter, is made of an outer fabric woven with ceramic fibers and two inner layers of insulating material designed to trap heat. The mission could mark a turning point both in planetary exploration and in Earth re-entry operations. An Atlas V rocket will carry, alongside the environmental satellite JPSS-2, a flying saucer-like structure that will later be released to descend through the atmosphere at high speed.

Landing on other planets has always been one of the most challenging tasks in space exploration. Nearly half of the probes sent to Mars—by the United States, Russia in the past, and more recently the European Space Agency—have failed, often during the final phase of descent. The Martian atmosphere is extremely thin, which creates significant difficulties: it slows down incoming spacecraft far less effectively than Earth's denser atmosphere.

This new technology aims to improve on the rigid heat shields used in previous missions. Developed by NASA's Langley Research Center, the inflatable system deploys before atmospheric entry, shielding its valuable payload of instruments all the way down to the surface—whether of another planet or of Earth.

(Giovanni Caprara, in "Corriere della Sera", 10 November 2022)

Compared to previous solutions, what is one advantage of the "inflatable shield" being tested by NASA?

- A) It avoids a rigid and relatively heavy solution that cannot be folded
- B) It does not need to be packed into a small volume when not in use
- C) It allows a slower and more controlled descent through the atmosphere
- D) The shield opens after atmospheric re-entry
- E) It avoids a rigid and relatively heavy solution that can be folded

2. Read the text and respond to each question only on the basis of the information it contains explicitly or implicitly and not on what you already know about the topic.

Without going too far out on a limb, I believe almost everyone would like two things from their jobs and careers: success and happiness. They want to do relatively well financially, receive fair recognition for their accomplishments, enjoy their work as much as one can, and become happier as a person as a result. And so many people first seek success and then assume that success will lead to happiness. But this reasoning is flawed. Chasing success has costs that can end up lowering happiness.

This is not to say that you have to choose between success and happiness. You can obtain both. But you have to reverse the order of operations: Instead of trying first to get success and hoping it leads to happiness, start by working on your happiness, which will enhance your success. Trying to improve happiness at work and in life is a better investment than chasing success. That means avoiding the trap of overwork and helping the people close to you avoid it as well. [...]

Once you have gained control over the amount of work you do, happiness in your professional life requires a sense of meaning and purpose. [...] The two crucial elements of a fulfilling job are feeling that you have earned success and that you are useful to others. That feeling of earned success involves a sense of accomplishment and recognition for work well done, while feeling useful means knowing that real people benefit from what we do.

(Arthur C. Brooks, The Atlantic, United States, November 2022.)

According to Arthur C. Brooks, how can you find a balance between success and happiness?

- A) By thinking about who benefits from our work and feeling recognized for our efforts
- B) By trying to achieve success through hard work and hoping it will soon lead to happiness
- C) By investing in improving our happiness in the workplace, which will lead to happiness in life
- D) By pursuing career success and connecting it to achieving happiness in life
- E) By choosing between professional success and happiness in life, and prioritizing happiness

3. Thanks to the immune system, our body is able to fend off attacks from bacteria, viruses, and protozoa that we encounter every day in our food and in the air. Most of these microorganisms are harmless to healthy individuals: a fully functioning immune system destroys them without causing any symptoms or noticeable effects. HIV, however, targets the very cells of the immune system. As a result, infected individuals experience a gradual loss of their defenses, until they cross a threshold beyond which the body's barrier against infection begins to break down. This is when the symptoms of so-called opportunistic infections—diseases caused by microbes that exploit the body's weakened defenses—begin to appear. Unfortunately, no part of the body is completely protected from these infections, which can include encephalitis, meningitis, retinitis, pneumonia, tuberculosis, fungal infections, esophagitis, and intestinal disorders.

(G. Maga, Occhio ai virus, Zanichelli)

Which of the following statements does not appear in the text?

- A) Our immune system is a barrier that fights HIV
- B) Our immune system fights off attacks from microorganisms
- C) HIV leads to a progressive loss of immune defenses
- D) HIV leads to the breakdown of the body's defenses against infections
- E) Every day, we are exposed to attacks from protozoa, viruses, and bacteria

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4. In 1492, the year America was "discovered", a Portuguese fleet commanded by Diego Cão reached the mouth of the Congo River. This was the first contact between the Angolans—part of the ancient Kingdom of Kongo—and the Portuguese. It was the beginning of the process of colonization. That process began with trading expeditions and missionary efforts, followed by military incursions deep into the interior. Until the mid-eighteenth century, local communities tenaciously resisted the invasion, but war and the deportation of enslaved people reduced the population from eighteen million in 1450 to just eight million in 1850.

(C. Lugarini (in), C'era una volta in Angola, Edizioni Dell'Arco)

Which of the following statements is not supported by the text?

- A) War, disease, and the deportation of slaves reduced the Angolan population by more than half
- B) Over the four hundred years from 1450 to 1850, the Angolan population decreased by ten million inhabitants
- C) The Portuguese invasion of Angola met with tenacious resistance from local communities for more than two centuries
- D) When the Portuguese, led by Diego Cão, arrived in Angola, it was part of the ancient Kingdom of Kongo
- E) From the end of the fifteenth century onward, Portugal carried out commercial, religious, and military activities in Angola

Logical reasoning and problems Test

5. The following table shows the results of a test:

Score	0	1	2	3	4	5	6	7	8	9	10
Frequency	1	4	4	6	2	1	3	1	1	1	0

To pass the test, a score higher than 6 is required. What percentage of the candidates passed the test?

- A) 12.5%
- B) 25%
- C) 20%
- D) 22.5%
- E) 50%

6. A veterinarian must administer a total of 15 mg of medication to a cat named Simba (weighing 4 kg) and a cat named Titta (weighing 2 kg), in proportion to their weights. How many mg of medication should be given to Titta?

- A) 5
- B) 8
- C) 9
- D) 6
- E) 10

7. Nine volleyball teams must compete in a round-robin tournament (each team plays every other team once and only once). How many matches will be played?

- A) 36
- B) 72
- C) 48
- D) 81
- E) 100

8. An alarm code has 5 digits. Alessio remembers the first three, but not the last two. How many attempts would he need to be sure of entering the correct PIN?

A) 100
B) 90
C) 20
D) 10
E) 81

9. 10320 seconds have passed since it was 9:38 a.m. What time is it now?

A) 12:30 p.m.
B) 1:30 p.m.
C) 12:40 p.m.
D) 12:20 p.m.
E) 1:20 p.m.

Biology Test

10. Which of these fatty acids is NOT composed of 18 carbon atoms?

A) Arachidonic acid
B) Linoleic acid
C) Stearic acid
D) Linolenic acid
E) Oleic acid

11. Which of the following amino acids belongs to the group of aromatic amino acids?

A) Tyrosine
B) Asparagine
C) Histidine
D) Glutamate
E) Proline

12. Two amino acids can condense with each other, with the loss of one molecule of water, forming a peptide bond, which consists of:

A) an amide bond between the carboxyl group of the first amino acid and the amino group of the second amino acid
B) a glycosidic bond between the amino group of the first amino acid and the carboxyl group of the second amino acid
C) an ester bond between the amino group of the first amino acid and the carboxyl group of the second amino acid
D) an anhydride bond between the carboxyl group of the first amino acid and the amino group of the second amino acid
E) a phosphodiester bond between the carboxyl group of the first amino acid and the amino group of the second amino acid

13. What does protein folding consist of?

A) Folding is the process by which proteins acquire their three-dimensional structure
B) Folding is the process by which proteins return to their primary structure
C) Folding is the process by which proteins lose their tertiary structure
D) Folding is the process by which proteins are hydrolyzed into peptides
E) Folding is the process by which misfolded proteins are degraded

14. Which of these statements about myoglobin is correct?

- A) It contains a prosthetic group
- B) It is a tetramer
- C) It is a fibrous protein
- D) It has a quaternary structure
- E) It functions as an enzyme

15. What are coenzymes?

- A) Non-protein molecules
- B) Catalytic proteins
- C) Globular proteins
- D) Membrane receptors
- E) Nuclear enzymes

16. What is the role of topoisomerases?

- A) They modify the supercoiling state of DNA
- B) They convert purine bases into pyrimidine base
- C) They facilitate the assembly of rRNA into ribosomes
- D) They enable the attachment of amino acids to tRNA
- E) They catalyse the polymerization of DNA strands

17. Which of these cell types enters the G0 phase irreversibly?

- A) Nerve cells
- B) Cancer cells
- C) Stem cells
- D) Epithelial cells
- E) Embryonic cells

18. What are tetrads, the structures that appear during prophase I of meiosis, composed of?

- A) Two homologous chromosomes, each consisting of two chromatids
- B) Four homologous chromosomes, each consisting of one chromatid
- C) Two non-homologous chromosomes, each consisting of one chromatid
- D) Two homologous chromosomes, each consisting of one chromatid
- E) Two non-homologous chromosomes, each consisting of two chromatids

19. During which process is one molecule of glucose converted into two molecules of pyruvate and two molecules of ATP?

- A) Glycolysis
- B) Photosynthesis
- C) Calvin cycle
- D) Cellular respiration
- E) Krebs cycle

20. What is the metabolic purpose of lactic acid fermentation?

- A) NADH oxidation
- B) ATP synthesis
- C) Oxygen production
- D) NAD⁺ reduction
- E) Glucose synthesis

21. Which of the following is a characteristic of photoautotrophic organisms?

- A) They can synthesize organic compounds from simple inorganic substances using sunlight as an energy source
- B) They cannot synthesize organic compounds from simple inorganic substances and therefore must feed on other organisms
- C) They cannot synthesize organic compounds from simple inorganic substances and therefore must obtain them from the environment
- D) They can synthesize organic compounds from simple inorganic substances using energy derived from ATP hydrolysis
- E) They can produce simple inorganic substances from organic compounds using sunlight as an energy source

22. Which of the following is a characteristic of retroviruses?

- A) They synthesize DNA from RNA
- B) They cannot infect human cells
- C) They do not have their own genome
- D) They lack a nucleocapsid
- E) They have a double-stranded DNA genome

23. What is the role of the spike protein in some viruses?

- A) It facilitates attachment to the host cell
- B) It enables supercoiling of viral DNA
- C) It is the enzyme that replicates the viral genome
- D) It blocks protein synthesis in the host cell
- E) It prevents lysis of the host cell

24. Which of the following statements about an individual's genotype is correct?

- A) The genotype is the combination of an individual's alleles
- B) An individual's genotype is influenced by the environment
- C) An individual's genotype is the product of their phenotype
- D) The genotype is the set of an individual's observable traits
- E) The genotype does not influence an individual's phenotype

25. In pea plants, the smooth seed trait (R) is dominant over wrinkled (r), while the yellow seed trait (Y) is dominant over green (y). Assuming that the genes for these two traits are not linked, what is the probability of obtaining offspring with smooth, green seeds from the cross $RRYy \times rrYy$?

- A) $\frac{1}{4}$
- B) $\frac{1}{3}$
- C) $\frac{1}{2}$
- D) None
- E) $\frac{1}{6}$

26. Colour blindness is an X-linked recessive genetic disorder. If a healthy father and a carrier mother have a male child, what is the probability that he is colour blind?

- A) 50%
- B) 25%
- C) 100%
- D) 0%
- E) 75%

27. Albinism is an autosomal recessive disorder. If two healthy parents have an affected child, it can be stated that:

- A) both parents are heterozygous for the mutation that causes the disorder
- B) one of the parents is not a carrier of the mutation that causes the disorder
- C) one of the parents is homozygous for the mutation that causes the disorder
- D) neither parent is a carrier of the mutation that causes the disorder
- E) only one parent is heterozygous for the mutation that causes the disorder

28. Why is the genetic code described as degenerate?

- A) Because different codons can code for the same amino acid
- B) Because some consecutive codons share a base
- C) Because the same codon can code for different amino acids
- D) Because five codons code for stop signals
- E) Because six codons do not code for any amino acid

29. What is a ribozyme?

- A) An RNA molecule with catalytic activity
- B) An enzyme that degrades mRNA
- C) An enzyme that synthesizes aminoacyl-tRNA
- D) A complex composed of rRNA and proteins
- E) A ribosome lacking the 40S subunit

30. A nucleoside differs from a nucleotide by the absence of which of the following components?

- A) A phosphate group
- B) An aromatic ring
- C) A hydroxyl group
- D) A sugar molecule
- E) A carbon atom

31. What is meant by the term systemic circulation? (Also known as the systemic circuit, and less commonly the greater circulation).

- A) The circulation through which oxygenated blood is delivered to tissues and organs and returns to the heart deoxygenated
- B) The circulation through which oxygenated blood is delivered to the lungs and returns to the heart deoxygenated
- C) The circulation through which deoxygenated blood is delivered to tissues and organs and returns to the heart oxygenated
- D) The circulation through which deoxygenated blood is delivered to the lungs and returns to the heart oxygenated
- E) The circulation through which deoxygenated blood is delivered to the kidneys and returns to the heart oxygenated

32. Where does protein digestion begin?

- A) In the stomach, with pepsin
- B) In the mouth, with pepsin
- C) In the mouth, with ptyalin
- D) In the duodenum, with ptyalin
- E) In the duodenum, with bile

Chemistry Test

33. Balance the following redox disproportionation reaction:



- A) $3 \text{NaClO} \rightarrow 2 \text{NaCl} + \text{NaClO}_3$
- B) $3 \text{NaClO} \rightarrow \text{NaCl} + 2 \text{NaClO}_3$
- C) $\text{NaClO} \rightarrow \text{NaCl} + \text{NaClO}_3$
- D) $4 \text{NaClO} \rightarrow \text{NaCl} + 3 \text{NaClO}_3$
- E) $2 \text{NaClO} \rightarrow \text{NaCl} + \text{NaClO}_3$

34. Which of the following condensed structural formulas correctly represents 1-chloro-3,3-difluorobutane?

- A) $\text{CH}_3\text{-CF}_2\text{-CH}_2\text{-CH}_2\text{Cl}$
- B) $\text{CH}_3\text{-CF}_2\text{-CH}_2\text{-CHCl}_2$
- C) $\text{CH}_3\text{-CH}_2\text{-CF}_2\text{-CH}_2\text{Cl}$
- D) $\text{CH}_2\text{Cl-CHF-CHF-CH}_3$
- E) $\text{CH}_2\text{Cl-CF}_2\text{-CF}_2\text{-CH}_3$

35. What is the acid dissociation constant (K_a) of an acid HA?

- A) $K_a = [\text{A}^-][\text{H}^+]/[\text{HA}]$
- B) $K_a = [\text{A}^+][\text{H}^-]/[\text{HA}]$
- C) $K_a = [\text{H}^+]/[\text{HA}]$
- D) $K_a = [\text{HA}]/[\text{A}^-][\text{H}^+]$
- E) $K_a = [\text{HA}]/[\text{A}^-]$

36. Which period does helium belong to?

- A) First
- B) Second
- C) Third
- D) Fourth
- E) Zero

37. Which of the following bonds is the most polar?

- A) H-F
- B) H-H
- C) H-I
- D) H-C
- E) H-O

38. Which of the following is the correct chemical formula for ferrous hydroxide?

- A) $\text{Fe}(\text{OH})_2$
- B) $\text{Fe}(\text{OH})_3$
- C) $\text{Fe}(\text{OH})_4$
- D) $\text{Fe}(\text{OH})$
- E) $\text{Fe}_2(\text{OH})_3$

39. An endothermic reaction:

- A) absorbs heat
- B) releases heat
- C) causes an explosion
- D) causes an implosion
- E) cannot occur without a catalyst

40. How many different substituents does a chiral carbon have?

- A) 4
- B) 3
- C) 2
- D) 1
- E) 0

41. Propanols are:

- A) alcohols
- B) carboxylic acids
- C) enols
- D) aldehydes
- E) diols

42. Which quantum numbers define the $3p_z$ orbital?

- A) $n=3, l=1, m=0$
- B) $n=1, l=3, m=0$
- C) $n=3, l=2, m=0$
- D) $n=3, l=1, m=2$
- E) $n=1, l=2, m=3$

43. The ionic product of water (K_w):

- A) increases as temperature increases
- B) decreases as temperature increases
- C) remains constant as temperature increases
- D) increases as the volume of the solution increases
- E) decreases as the volume of the solution increases

44. Calculate the mass (in grams) of hydrochloric acid (molar mass = 36.5 g/mol) present in 200 mL of a 0.2 M solution.

- A) 1.46 grams
- B) 2.92 grams
- C) 73 grams
- D) 7.3 grams
- E) None of the other answers are correct

45. An ester can be formed by the reaction of ethanoic acid with 1-propanol. What is the formula of the ester produced?

- A) $\text{CH}_3\text{COOCH}_2\text{CH}_2\text{CH}_3$
- B) $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3$
- C) $\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$
- D) $\text{CH}_3\text{CH}_2\text{COOCH}_3$
- E) None of the other answers are correct

46. What is the concentration of a solution containing 3.0 moles of hydrochloric acid in 0.5 kg of water, given that the solution has a density of 1.4 g/mL?

- A) 6 m
- B) 6 M
- C) 3 m
- D) 0.5 M
- E) 0.5 m

47. What is the osmotic pressure at 0 °C of a solution ($d = 1 \text{ g/mL}$) containing urea (molecular mass = 60 g/mol) at 0.6% w/v?

- A) 2.24 atm
- B) 1.867 atm
- C) 0.1 atm
- D) 0.224 atm
- E) None of the other answers are correct

Physics and Mathematics Test

48. An object weighing 0.5 kg is thrown vertically upward with an initial velocity of 1 m/s. Neglecting air resistance, how long does it take to reach its maximum height?

- A) Approximately 1/10 s
- B) Approximately 10s
- C) Approximately 9s
- D) Approximately 1/100 s
- E) Approximately 1/20 s

49. If a car travels around a flat curve, which force provides the centripetal acceleration that prevents the car from skidding?

- A) Static friction between the tires and the road surface
- B) The weight of the car
- C) The normal reaction to the road
- D) Kinetic friction
- E) Centrifugal force

50. In the presence of conservative and non-conservative forces:

- A) the work done by non-conservative forces is equal to the change in the system's mechanical energy
- B) mechanical energy is conserved
- C) the work done by non-conservative forces is equal to the change in kinetic energy
- D) the work done by non-conservative forces is equal to the change in potential energy
- E) mechanical energy reaches its minimum value

51. Which of these objects is a first-class lever?

- A) A balance scale
- B) A nutcracker
- C) A wheelbarrow
- D) Tweezers
- E) Nail clippers

52. An ideal gas kept in a given vessel is maintained at constant temperature by a thermostat. What is the relationship between the thermodynamic variables pressure and volume?

- A) They are inversely proportional
- B) They are directly proportional
- C) They are related by an exponential relationship
- D) The pressure increases quadratically as the volume decreases
- E) The volume remains constant while the pressure changes

53. Two capacitors connected in parallel are connected in series with a third capacitor. What is the equivalent capacitance of the system if each capacitor has a capacitance of 2 pF?

A) $\frac{4}{3}$ pF
B) 3 pF
C) 0 pF
D) $\frac{1}{2}$ pF
E) $\frac{3}{2}$ pF

54. In a Cartesian coordinate system with perpendicular axes drawn to the same scale, what is the equation of the line that passes through the origin and is parallel to the line $y = 5x + 2$?

A) $y = 5x$
B) $y = -\frac{1}{5}x$
C) $y = 3x$
D) $y = \frac{1}{5}x$
E) $y = -5x$

55. For which real values of x is the inequality $\sqrt{x+1} < x-1$ satisfied?

A) For all real values of x such that $x > 3$
B) For all real values of x such that $x \geq 3$
C) For all real values of x such that $x < 3$
D) For all real values of x such that $x \leq 3$
E) For all real values of x such that $x \neq 3$

56. For which values of the real number b does the equation $x^2 + bx + 1 = 0$ have two distinct real solutions?

A) For all $b < -2$ or $b > 2$
B) For $b = -2$ or $b = 2$
C) For all $b < 2$
D) For all $b > -2$
E) For all b such that $-2 < b < 2$

57. Which of the following expressions is a polynomial but not a monomial?

A) $a + 9a^2$
B) $2ab^2c$
C) $(\frac{1}{5} + 9)ab^2$
D) $(2ab^2c)(a^2b)$
E) $a^2 + 9a^2$

58. What is the difference between two opposite monomials?

A) Twice the first monomial
B) 0
C) Twice the second monomial
D) The difference is not a monomial
E) 1

59. What is the equation of the pencil of lines with centre $C(4,0)$?

A) $y = mx - 4m$
B) $y = mx + 4m$
C) $y = -4x + q$
D) $y = 4x + q$
E) $y = mx + 4$

60. Which of the following are the solutions of the equation $(x^2 - 5x + 6)(x + 4)$?

- A) -4, 2 and 3
- B) -2, 3 and -4
- C) 2, 3 and 4
- D) -5, -4 and 1
- E) None of the other answers are correct

***** FINE DELLE DOMANDE *****