Ministero dell'Università e della Ricerca

CALL FOR APPLICATIONS FOR ADMISSION TO THE NATIONAL RESTRICTED ACCESS SINGLE-CYCLE DEGREE PROGRAMMES IN MEDICINE AND SURGERY AND IN DENTISTRY AND DENTAL PROSTHODONTICS

Anno Accademico 2025/2026

Per ogni domanda, la risposta esatta è quella evidenziata

Reading skills and knowledge acquired during studies

1. ***"Other serious conditions (the frequency cannot be determined based on available data): yellowing of the skin or the whites of the eyes (indicative of severe liver cell damage or jaundice), or symptoms such as fever, rash, and kidney enlargement. These may sometimes be accompanied by painful urination and lower back pain (signs of severe kidney inflammation), which can potentially progress to kidney failure."***

From the informational leaflet for Teva Pantoprazolo

Which of the following statements is the correct interpretation of the information contained in this excerpt?

A) Using this medication could lead to serious kidney problems.
B) Using this medication always leads to yellowing of the skin.
C) Using this medication could lead to pancreatic problems.
D) Using this medication never leads to urinary tract problems.
E) Those with kidney failure may benefit from using this medication.

2. **"The Information and Communication Technology sector in Apulia is in full recovery.**
After the 2.4% decline recorded in 2020, the Apulian digital market -- valued just under three billion -- is regaining ground, resuming the steady growth seen in recent years. Despite the difficulties companies face in finding all the specific professionals, whom the university system can only partially train, the upward trend has resumed.
As demonstrated by the results of Exprivia, active in ICT and listed on the MTA market of the Milan Stock Exchange, in the first quarter, the revenue of this big player -- total revenues in 2020 at 167.8 million, 2,400 professionals distributed in 7 countries worldwide -- grew by 5.4% compared to the same period in 2020, rising from 38 to 41 million. Profitability has grown and continues to grow, which in 2020 was 12.7 percent. 'Companies,' explains Gianni Sebastiano, Investor Relator of the group led by Domenico Favuzzi, 'are recovering profitability because they are revising their processes. The more digitalization you put into processes, the more you impact efficiency and costs: this is the great lesson of the pandemic.' The Apulian company aims to consolidate the growth recorded in recent months in all the markets in which it operates as a system integrator: public administration, banks, aerospace, local health, telemedicine."

from "Il Sole 24 ore" 28 June 2021

Indicate which of the following statements is **not correct:**

A) the pandemic ensured the growth of the Apulian digital sector because companies in the sector transformed into digital companies.
B) the growth of the Apulian digital sector is due to, among other reasons, revisions in company processes.
C) despite shortages in the number of adequate professionals, the Apulian digital sector has recorded increased profitability over the past year.
D) the pandemic was one the factors that led to the digitalization of company processes.
E) the digitalization of company processes is one of the principle causes for the economic growth of the sector.

3. ***"This animal catches a man and straightway kills him; after he is dead, it weeps for him with a lamentable voice and many tears. Then, having done lamenting, it cruelly devours him. It is thus with the hypocrite, who, for the smallest matter, has his face bathed with tears, but shows the heart of a tiger and rejoices in his heart at the woes of others, while wearing a pitiful face."***

The *Notebooks* of Leonardo da Vinci

Which animal is the author talking about in this text?

A) Crocodile
B) Lion
C) Panther
D) Tiger
E) Boa

4. ***In 1955, Dr. Vincent Zigas discovered that kuru, a deadly inflammation of the brain widespread among the indigenous people of New Guinea, was caused by a practice linked to a local funeral rite: eating the brains of deceased relatives. Another encephalopathy that resembles kuru is Creutzfeldt-Jakob disease, which is not only found in New Guinea. Creutzfeldt-Jakob is rare and a difficult-to-diagnose problem, as it is sometimes confused with diseases like Alzheimer's. Both kuru and Creutzfeldt-Jakob are caused by an infectious protein, the prion, present in the tissues of the affected individuals even after death.***

G. Maga *Batteri spazzini e virus che curano* Zanichelli

Only one of the following statements is coherent with the excerpt:

A) Kuru, Creutzfeldt-Jakob Disease and Alzheimer's are diseases whose diagnoses can be confused with each other
B) Alzheimer's is recognizable as a development of Creutzfeldt-Jakob Disease
C) Vincent Zigas discovered a cure for the negative effects of prions
D) Creutzfeldt-Jakob Disease is widespread in New Guinea as a result of the practice of consuming the brains of deceased relatives
E) the prion is a bacterium which develops after death inside tissue proteins

Logical reasoning and problem-solving

5. **Consider this statement:**
The number two is a prime number.
Which of the following statements is deducible from the given statement?

A) At least one prime number exists.
B) No prime numbers exist.
C) At least one number is not a prime number.
D) No number is a prime number.
E) All numbers are prime numbers.

6. **From the given statements**
If today is Saturday, then I am a philosopher
I am not a philosopher
Which conclusion can be deduced?

A) Today is not Saturday.
B) Today is Saturday.
C) Today is Friday.
D) I am a philosopher.
E) None of the other choices is correct.

7. **Alberto, Beatrice, Carlo, and Daniela are dining at the same square table, each seated on one side of the table. Alberto is seated to the left of Beatrice but not to the right of Carlo. Which of the following statements can be deduced?**
   A) Daniela is seated to the right of Carlo.
   B) Carlo is seated across from Beatrice.
   C) Daniela is seated to the left of Beatrice.
   D) Alberto is seated to the left of Carlo.
   E) Beatrice is seated across from Alberto.

8. **Three pills — coloured blue, red, and green, respectively, — are each placed individually inside three small boxes of the same colours — blue, red, and green — in such a way that no pill is inside the box of its own colour. Additionally, the blue pill is not in the green box. Which pill is in which box?**
   A) The green pill is in the blue box, the red pill is in the green box, the blue pill is in the red box.
   B) The green pill is in the blue box, the red pill is in the blue box, the blue pill is in the green box.
   C) The blue pill is in the green box, the green pill is in the red box, the red pill is in the blue box.
   D) The red pill is in the blue box, the green pill is in the green box, the blue pill is in the red box.
   E) The blue pill is in the blue box, the green pill is in the green box, the red pill is in the red box.

9. **At this moment, an analogue clock is showing exactly 3:00 PM. After the minute hand has completed 1.75 full rotations from its current position, what time will the clock indicate?**
   A) 4:45 PM
   B) 1:25 PM
   C) 3:35 PM
   D) 4:30 PM
   E) 5:00 PM

Biology

10. **During lactic fermentation, pyruvic acid is:**
   A) reduced
   B) oxidised
   C) decarboxylated
   D) phosphorylated
   E) dephosphorylated

11. **Which of the following statements about glycolysis is correct?**
   A) When a molecule of glucose is converted to pyruvate in glycolysis, 2 NAD^+ are reduced.
   B) Triose phosphate isomerase catalyses the conversion of dihydroxyacetone phosphate to 1,3-bisphosphoglycerate.
   C) Phosphofructokinase catalyses the conversion of fructose 1,6-bisphosphate to dihydroxyacetone phosphate.
   D) When a molecule of glucose is converted to pyruvate in glycolysis, CO_2 is produced.
   E) In the first part, $FADH_2$ is formed.

12. **Each acetyl-CoA molecule that enters the Krebs cycle produces:**
   A) 3 NADH, 1 $FADH_2$, 1 GTP and 2 molecules of CO_2
   B) 1 NADH, 3 $FADH_2$, 1 GTP and 2 molecules of CO_2
   C) 3 NADH, 1 $FADH_2$, 1 GTP and 3 molecules of CO_2
   D) 3 NADH, 1 $FADH_2$, 2 GTP and 3 molecules of CO_2
   E) 2 NADH, 2 $FADH_2$, 2 GTP and 2 molecules of CO_2

13. Oxidative phosphorylation is a metabolic pathway:

A) through which the energy stored in reduced coenzymes is used for the synthesis of ATP
B) through which the amino group resulting from the degradation of amino acids is eliminated
C) through which fatty acids are broken down by removing two carbon atoms at a time
D) which represents the final stage of the anabolism of amino acids, carbohydrates, and fatty acids
E) through which fatty acid synthesis occurs

14. Cytochromes are:

A) present in the respiratory chain
B) transporters of hydrogen atoms in the respiratory chain
C) enzymes that synthesize ATP
D) inhibitors of oxidative phosphorylation
E) cofactors of glycolysis

15. Collagen is a protein that is:

A) extracellular
B) membranous
C) intracellular
D) abundant in the thick filament
E) nuclear

16. Muscle contraction is triggered by an increase in the concentration of calcium ions that bind to:

A) troponin
B) myosin
C) tropomyosin
D) actin
E) vimentin

17. Which of the following statements about myosin and actin is CORRECT?

A) The binding of ATP to the actin-myosin complex promotes the dissociation of the complex.
B) The binding of ATP to the actin-myosin complex promotes the formation of the complex.
C) The binding of calcium to troponin is necessary for the dissociation of the actin-myosin complex.
D) Actin has ATPase activity.
E) Tropomyosin has ATPase activity.

18. The Bohr effect is observed in tissues that are oxidizing large amounts of nutrients, generating hydrogen ions, and releasing CO_2 into the blood. This results in:

A) a decrease in oxygenated haemoglobin molecules
B) an increase in oxygenated haemoglobin molecules
C) an increase in the total number of red blood cells
D) the denaturation of haemoglobin
E) an increase in protein synthesis

19. Which of the following compounds corresponds to the statement "a substance that increases the speed of a reaction and is found unchanged at the end of it"?

A) Catalyst
B) Effector
C) Cofactor
D) Modulator
E) Cholesterol

20. In competitive inhibition:

A) the inhibitor and the substrate compete for the active site of the enzyme
B) the inhibitor binds to the substrate, preventing a reaction with the enzyme
C) the inhibitor binds to the allosteric site and prevents the substrate from binding to the enzyme
D) the inhibitor prevents the release of products from the active site
E) the inhibitor binds to the enzyme-cholesterol complex

21. Which of the following classes of digestive enzymes is involved in the digestion of proteins?

A) Peptidase
B) Amylase
C) Lipase
D) Isomerase
E) Transaminase

22. Oxidative phosphorylation involves:

A) both membrane proteins and mobile molecules
B) exclusively mitochondrial matrix proteins
C) exclusively integral membrane proteins
D) exclusively peripheral proteins
E) only nuclear proteins

23. How are the reduced coenzymes that are formed during biological oxidation reoxidized?

A) Through the respiratory chain
B) Through the process of beta oxidation
C) By direct action of oxygen
D) Through the passage of electrons in ATP synthase
E) With the synthesis of hormones

24. Which high-energy reserve compound contains phosphate groups and is present in muscles?

A) Creatine phosphate
B) Carnitine phosphate
C) Creatinine phosphate
D) Glucose 1-phosphate
E) Phosphofructokinase

25. Which of the following metabolic processes occurs mainly in the liver?

A) Urea cycle
B) Glycolysis
C) β-oxidation of fatty acids
D) The Krebs Cycle
E) Transamination

26. It is more advantageous for humans to store energy as triglycerides in adipose tissue rather than as proteins in muscles because triglycerides in adipose tissue contain:

A) more calories and less water
B) fewer calories and less water
C) fewer calories and more water
D) more calories and more water
E) more oxygen and less nitrogen

27. Lysosomes are organelles:

A) that form by budding from the Golgi apparatus
B) equipped with enzymes that function optimally at a pH above 7
C) that form by budding from the smooth endoplasmic reticulum
D) whose malfunction is currently not believed to be associated with diseases
E) responsible for the synthesis of proteins destined for secretion

28. Which of the following statements is correct?

A) The nucleus, mitochondria and chloroplasts all contain DNA.
B) Only the nucleus contains DNA while mitochondria and chloroplasts contain RNA.
C) All cellular organelles possess a small amount of DNA.
D) The rough endoplasmic reticulum contains the DNA necessary for protein synthesis.
E) Prokaryotes have a well-defined nucleus containing DNA.

29. What is the main function of the plasma membrane in cells?

A) Regulating exchanges between the inside and outside of the cell
B) Providing energy to the cell
C) Synthesizing proteins
D) Containing the cell's genetic material
E) Facilitating cell movement

30. Which reactions are defined as exergonic?

A) Reactions that release energy and occur spontaneously
B) Reactions that require heat to proceed
C) Reactions that occur only in the presence of light
D) Reactions that produce chemical energy without the consumption of reactants
E) Reactions that always involve the synthesis of new compounds

31. What is the main role of osteoblasts?

A) Producing collagen and minerals for the bone matrix
B) Resorbing minerals from the bone
C) Regulating blood pH
D) Breaking down damaged bone tissue
E) Transporting nutrients in the bone marrow

32. Insulin:

A) stimulates glucose uptake in muscle
B) stimulates the breakdown of glycogen
C) is a steroid hormone
D) inhibits fatty acid synthesis
E) is secreted by the adrenal gland

Chemistry

33. The equation of state for ideal gases is:

A) $PV = nRT$
B) $nV = PRT$
C) $V = RT/(Pn)$
D) $V = Pn/(RT)$
E) $Pn = VRT$

34. In which of these compounds does Cl have an oxidation number of +3:

A) $HClO_2$
B) Cl_2
C) HCl
D) $HClO$
E) $HClO_3$

35. An oxidation number cannot be:

A) an irrational number
B) a negative number
C) a positive number
D) a number with a decimal point
E) zero

36. What kind of solid is NaCl?

A) Ionic
B) Molecular
C) Metallic
D) Covalent network
E) Amorphous

37. In the periodic table, the atomic radius increases going:

A) from right to left and from top to bottom
B) from left to right and from top to bottom
C) from right to left and from bottom to top
D) from left to right and from bottom to top
E) from top to bottom but horizontally in a very irregularly way

38. A pure covalent bond is a bond that forms between:

A) two atoms of the same element
B) two atoms with quite similar electronegativity
C) two atoms with very different electronegativity
D) two atoms with no electronegativity
E) two identical ions

39. The pH of an aqueous solution of a monoprotic weak acid with the constant $K_a = 1.0 \times 10^{-5}$ and concentration 0.001 M is:

A) 4
B) 3
C) 10^{-8}
D) 8
E) 5.5

40. What is the pH of a 0.7 M aqueous solution of KBr?

A) 7
B) 0.7
C) 13.3
D) 10^{-7}
E) $10^{-0.7}$

41. Given the equilibrium Heat + $2FeCl_3$ (s) ⇆ $2FeCl_2$ (s) + Cl_2 (g)
Which of the following options is correct:

A) to shift the equilibrium to the left, it is necessary to increase the concentration of Cl_2.
B) to shift the equilibrium to the left, it is necessary to increase the concentration of $FeCl_2$ (s).
C) to shift the equilibrium to the left, it is necessary to remove $FeCl_3$ (s).
D) to shift the equilibrium to the right, it is necessary to cool the reaction.
E) to shift the equilibrium to the right, it is necessary to increase the concentration of $FeCl_3$ (s).

42. The activation energy of a reaction represents:

A) the energy barrier that the reactants must overcome to transform into products
B) the difference between the energy of the products and that of the reactants
C) the difference between the kinetic energy and the potential energy of the reactants
D) the energy released during the progress of a reaction
E) the energy that is released only in the initial phase of any reaction in solution

43. In benzene:

A) all the carbon atoms are sp^2 hybridized and the molecule has a planar structure
B) all the carbon atoms are sp^3 hybridized and the molecule has a planar structure
C) all the carbon atoms are sp^2 hybridized and the molecule has a chair or boat structure
D) all the carbon atoms are sp hybridized
E) three carbon atoms are sp^3 hybridized and three atoms are sp^2 hybridized

44. Glycogen:

A) is a homopolysaccharide
B) is a heteropolysaccharide
C) is a disaccharide
D) is a storage molecule present in both animal and plant cells
E) is a polypeptide

45. The compound $FeCO_3$ is:

A) ferrous carbonate
B) ferric carbonate
C) iron oxide
D) iron pentacarbonyl
E) none of the other answers is correct

46. How many electrons can occupy an orbital?

A) Two with antiparallel spins
B) Two with parallel spins
C) Three
D) Just one
E) Four

47. Which of the following statements about amino acids is true?

A) They contain an amine group and a carboxyl group
B) They are normally poorly soluble in water
C) They dissolve well in hexane
D) They are one of the main constituents of carbohydrates
E) They have no acid/base activity

Physics and Mathematics

48. What is the solution to the inequality $\sqrt{2x} < 1 + x$?

A) $\forall x \geq 0$
B) R
C) $\forall x > 0$
D) $\varnothing$
E) $\forall x \neq 0$

49. Which of the following inequalities is satisfied for every real value of x ?

A) $\sin^2 x + \sin x - 2 \leq 0$
B) $\cos^2 x - \cos x - 2 \geq 0$
C) $\tan^2 x - 2\tan x + 1 > 0$
D) $2\sin^2 x - \sin x - 1 > 0$
E) $2\cos^2 x + \cos x - 1 < 0$

50. What does the Cartesian product of a set A and a set B correspond to?

A) The set of all possible ordered pairs having as the first component an element of A and as the second component an element of B
B) The representation of the intersection set of A and B
C) The representation of the union set of A and B
D) The set consisting of the products of corresponding numerical elements of A and B
E) The representation of the difference set of A and B

51. The trinomial $a^2 - 4ab + 4b^2$ is equal to:

A) $(a - 2b)^2$
B) $a^2 + b^2$
C) $a^2 - b^2$
D) $2(a + b)^2$
E) $a^2 + b^2$

52. In a rectangle ABCD the base AB is 5/4 of the height BC and the perimeter is 72 cm. What are the dimensions of the rectangle?

A) AB = 20 m; BC = 16 m
B) AB = 10 m; BC = 8 m
C) AB = 12 m; BC = 10 m
D) AB = 18 m; BC = 16 m
E) AB = 20 m; BC = 18 m

53. For which values of a is the equation $3x + a = 3$ determined?

A) For any value of a
B) For no value of a
C) For $a \neq -3$
D) For $a \neq 3$
E) For $a \neq 0$

54. Given the equation $(a + 3)x = 5$, which of the following values of a is impossible?

A) $a = -3$
B) $a = 3$
C) $a = 5$
D) $a = -5$
E) $a = 0$

55. Two cars, A and B, are moving in uniform rectilinear motion with speeds of 120 km/h and 80 km/h, respectively. If at the initial moment A is 500 meters behind B, after one minute:

A) A has overtaken B
B) A has not yet overtaken B
C) A has exactly reached B
D) A will never overtake B
E) A will overtake B after a much longer time than one minute

56. An electric circuit consists of 100 branches connected in parallel. Each branch has 10 resistors in series, each with a value of R. What is the equivalent resistance?

A) R/10
B) 10R
C) 100R
D) R/100
E) R

57. Which of these particles move in a straight horizontal metal wire carrying a current from left to right?

A) Only the electrons moving from right to left
B) Only the protons moving from right to left
C) Only the electrons moving from left to right
D) Only protons moving from left to right
E) The electrons moving from left to right and the protons from right to left

58. An astronaut takes a spacewalk at a distance from the Earth's surface equal to three times the Earth's radius. What fraction of g corresponds to the acceleration experienced by the astronaut?

A) 1/16
B) 1/9
C) 1/3
D) 1/4
E) 1/6

59. A car with a mass of 2.0×10^3 kg travels in a straight line at a constant speed on a flat road. Its speed is 15 m/s. At a certain moment (t = 0) it accelerates with a constant acceleration of 2.0 m/s^2, in the same direction as the velocity. The constant friction force is 2000 N. The forces F1 e F2 exerted by the engine in the first and second segments, respectively, are:

A) F1 = 2000 N, F2 = 6000 N
B) F1 = 0, F2 = 4000 N
C) F1 = 0, F2 = 6000 N
D) $F1 = 30 \times 10^3$ N, F2 = 4000 N
E) F1 = F2 = 2000 N

60. A stationary liquid exerts on the walls of the container that holds it:

A) forces always perpendicular to the walls at every point
B) forces in any direction relative to the walls
C) forces always parallel to the walls at every point
D) no forces on the walls, only pressure
E) forces equal to zero

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