IMAT 2025
PROGRAM

TOLC-MED 2024 (MAY) EXAM

EXAM DATE :
2024/05/28

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IMAT 2025 REVIEW COURSE

- **Multiple Choice Exams for Each Topic:** One exam per topic is required to test your understanding thoroughly.
- **8 Mock Tests** in **IMAT Style**: Full-length practice tests to simulate the actual exam experience.
- **Study Planner**: A detailed schedule to help you review and stay on track with your studies.
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A PLAN FOR THE 17TH OF SEPTEMBER

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The TOLC-MED test is administered twice a year by the Italian Ministry of Education. While these exams are generally easier than the IMAT tests, they share the same syllabus and number of questions. To prepare effectively for the IMAT exams, it is advisable for students to practice with the TOLC-MED tests. We recommend that students solve tests from at least the past five years.

01 LOGIC

5 Questions
All types of question

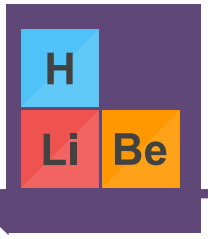
02 GK

4 Questions
All types of questions

03 BIOLOGY

23 Questions
All topics

04 CHEMISTRY

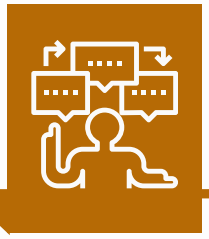


15Questions
All topics

05 PHYSICS

7 Questions
All topics

06 MATH



6 Questions
All topics

1. The phrase “Don Abbondio was not born with the heart of a lion” is:
   A) a litotes
   B) an antiphrasis
   C) a metaphor
   D) a metonymy
   E) an oxymoron

2. The discovery of vitamins was a real revolution. In fact, the era of vitamin research began at the end of the 19th century, at a time when Pasteur’s work highlighted that the presence of exogenous agents (microbes or microbial toxins) is responsible for certain diseases. For vitamins, researchers had to follow a reverse procedure, as it is the absence of a nutritional factor that causes major deficiency diseases: beriberi, scurvy, rickets, and pellagra. [...] Vitamins are organic substances, with no intrinsic energy value, necessary for the body and which humans cannot synthesize in sufficient quantities; therefore, they must be provided by the diet. Vitamins constitute a group of chemically very heterogeneous molecules; some of them have structures similar to those of other organic compounds: vitamin C and sugars, vitamin D and steroid hormones, vitamin B12 and porphyrins.

(J. Le Grusse, B. Waitier - The Vitamins - Roche Study Center)

Which of the following statements is not deducible from the text?

A) The presence of vitamins is the cause of some deficiency diseases.
B) Vitamins are organic substances.
C) Humans can synthesize vitamins.
D) Some vitamins have different chemical structures from each other.
E) Not all vitamins have a chemical structure similar to that of sugars.

3. “A phenomenon consisting in the reduction of the general level of prices and the consequent increase in the purchasing power of money, generally determined by a reduction in the amount of money in circulation relative to the income produced: it is an undesirable phenomenon generally associated with a reduction in economic activity.”

(Encyclopedia Treccani)

To which of the following terms does the above definition refer?
A) inflation
B) deflation
C) stagnation
D) recession
E) none of the other proposals is correct

4. Next to each reflection on biblical texts, a reference to a historical, contemporary, or near our time event was inserted. [...] Even in our time, many other figures could be recognized as capable of prophecy: they are men and women, even decidedly outside the ecclesial community, who know how to listen to the words of hope of the Scriptures, even without calling them "sacred"; who know how to recognize the Way that leads to the good of humanity without calling it "salvation"; who spend their lives to accompany others to the fullness of themselves and the gift sown in them, even without appealing to the ethics that springs from the Christian experience; who embody with conviction and dedication the richness we know from the Good News of Jesus, perhaps even without referring to it or knowing it.

(Orazio Antoniazzi - The Spirit Blows Where It Wants - Centro Ambrosiano)

Which of the following deductions derived from reading the text is correct?

A) The men and women recognized as capable of prophecy believe that the only salvation is the Way that leads to the good of humanity.
B) The men and women recognized as capable of prophecy are exclusively people outside the ecclesial community.
C) The men and women recognized as capable of prophecy consider the words of hope of the Scriptures to be "sacred".
D) The men and women recognized as capable of prophecy appeal solely to the Christian experience.
E) The men and women recognized as capable of prophecy accompany others to the fullness of themselves.

5. Let A, B, and C be three statements. The proposition $((A \wedge B) \wedge \neg C)$ is true if:

A) A is true, and B and C are false
B) A, B, and C are true
C) A and B are true, and C is false
D) A and C are true, and B is false
E) A is false, and B and C are true

6. All lovers are happy—those who are happy smile. Roberto is happy. If the previous statements are true, which of the following deductions is certainly not correct?

A) Those who are happy are in love.
B) Roberto smiles.
C) Those who are in love smile.
D) It is not said that Roberto is in love.
E) Roberto is happy.

7. Andrea's house exceeds by 42 square meters the half of the total area of Benedetto's and Cesare's houses. Indicating with A, B, and C the area in square meters of Andrea's, Benedetto's, and Cesare's houses respectively, which of the following equations is correct?

A) $A = (42 + B + C)/2$
B) $A + 42 = (B + C)/2$
C) $A = 42 + 2(B + C)$
D) $A - 42 = (B + C)/2$
E) $A + 42 = 2(B + C)$

8. After school, Andrea is always very hungry and stops at a bakery. When he buys two filled focaccias and a pastry, he spends €8, when he buys one filled focaccia and two pastries, he spends €7. Today he bought only one filled focaccia and one pastry, how much did he spend?

A) €5.50
B) €6
C) €4
D) €4.50
E) €5

9. A commuter takes the train northbound to work. In the morning, he sits facing the same direction as the train's movement with the window directly to his left. In the evening, he sits facing the opposite direction of the train's movement with the window directly to his right. Which of the following statements is correct?

A) In the evening, the commuter sits next to a window facing east.
B) The windows next to which the commuter sits always face the same cardinal point both on the outward and return journeys.
C) On the outward and return journeys, the commuter faces different cardinal points.
D) In the morning, the commuter sits next to a window facing east.
E) In the evening, the commuter sits facing south.

10. An organism that is heterozygous for a given trait:

A) is a gamete carrying the Y chromosome
B) has different alleles for a given gene on homologous chromosomes
C) has identical alleles for a given gene on homologous chromosomes
D) is the male zygote
E) has multiple forms of the same zygote

11. Which of the following statements about the electron transport chain in mitochondria is NOT correct?

A) Electrons increase their free energy at each step of the transport chain.
B) The final electron acceptor is oxygen.
C) The electron carriers alternate between a reduced and oxidized state as they accept and donate electrons.
D) The electron carriers are associated with the inner mitochondrial membrane.
E) The electrons transported along the chain come from NADH and FADH2 molecules.

12. To which class do the enzymes responsible for linking two molecules belong?

A) Lyases
B) Hydrolases
C) Transferases
D) Oxidoreductases
E) Ligases

13. The secretion of glucagon is regulated by:

A) Blood glucose levels
B) Hypothalamus
C) Thyroid
D) Variations in blood pH
E) Adrenaline levels

14. Lactose is:

A) A disaccharide whose hydrolysis produces galactose and glucose
B) A monosaccharide
C) A disaccharide whose hydrolysis produces fructose and glucose
D) A polysaccharide
E) A glycoprotein

15. What is cholesterol?

A) A triglyceride
B) A glycolipid with a linear structure
C) A lipid with a tetracyclic structure
D) A saturated fatty acid
E) A lipoprotein

16. An anomaly where there is an extra or missing chromosome compared to normal is called:

A) Aneuploidy
B) Trisomy
C) Monosomy
D) Karyotype
E) Translocation

17. What is the process called whereby molecules flow from an area of higher concentration to an area of lower concentration?

A) Dialysis
B) Transfusion
C) Respiration
D) Diffusion
E) Primary active transport

18. The part of the metaphase chromosome that holds the sister chromatids together is:

A) The sarcomere
B) The centromere
C) The chiasma
D) The centriole
E) The telomere

19. Which of the following statements about the inactivation of one X chromosome in female mammalian cells is correct?

A) Generally, for X-linked genes, in female tissues, 1/2 of the cells express the paternal alleles and 1/2 the maternal ones.
B) Female cells express double the amount of X-linked gene products as male cells.
C) The Barr body present in interphase nuclei represents the inactive X chromosome and is present in both male and female somatic cells.
D) The number of Barr bodies present in female somatic cells is equal to the number of X chromosomes in the cell.
E) Female somatic cells have only one X chromosome per cell.

20. What are the coronary arteries?
A) Cells that surround the axons of motor neurons
B) Arteries that carry oxygenated blood to the brain
C) Arteries that supply and nourish the heart
D) Nervous system cells that provide support and protection to neurons
E) Fibers of the heart's conduction system

21. What is bradycardia?
A) A heart rate below normal
B) An alteration of the myocardium that makes it smaller than normal
C) A diastolic blood pressure value below 60 mmHg
D) An anomaly of the atrioventricular valves
E) A cardiac output below 5L/min

22. The production of which substance can be compromised by a pathology affecting the endocrine pancreas?

A) Insulin
B) Gastrin
C) Histamine
D) Adrenaline
E) Oxytocin

23. In which tissue are the cellular elements called chondrocytes found?

A) Cardiac muscle
B) Dense connective
C) Cartilaginous
D) Spongy bone
E) Glandular epithelial

24. What is meant by the "secondary structure" of a protein?

A) The conformation of the polypeptide chain in regions as alpha-helix or beta-sheet
B) The shape it assumes immediately after synthesis
C) Its nucleotide sequence
D) Its amino acid sequence
E) The number of subunits of which the active protein is composed

25. The genetic code:

A) Consists of 64 codons coding for amino acids
B) Consists of 64 codons, three of which are STOP codons
C) Consists of 64 codons, each coding for a different amino acid
D) Is different from one organism to another
E) In eukaryotes consists of DNA, while in viruses it consists of RNA

26. The promoter:

A) Is an RNA sequence necessary to activate translation
B) Is an RNA sequence necessary to activate the transcription of a gene
C) Is a DNA sequence necessary to regulate the transcription of a gene
D) Is the site of the beginning of transcription of a gene
E) Is a protein factor necessary to activate the transcription of a gene

27. Viruses:

A) Can have DNA or RNA genomes
B) Can replicate outside host cells
C) Are the smallest living organisms
D) Do not infect plant cells
E) Always kill the cells they infect

28. Which of the following statements is NOT correct?

A) Glycolipids are the main constituents of cell membranes
B) Glycerol is an organic compound containing three hydroxyl groups
C) Glycogen is a polysaccharide with an energy storage function
D) Glyceraldehyde is a three-carbon carbohydrate
E) Glyphosate is a substance with herbicidal action

29. Which of the following molecules is NOT a polymer?

A) insulin
B) tRNA
C) Deoxyribose
D) Starch
E) Chitin

30. Which of the following statements about amino acids is correct?

A) The amino acids cysteine and methionine contain a sulfur atom
B) The essential amino acids for humans are 20
C) The amino acid with which protein synthesis always starts is arginine
D) All amino acids have polar side chains
E) All amino acids have an asymmetric carbon atom

31. Which of the following statements about carbohydrates is correct?

A) All carbohydrates contain carbon, oxygen, hydrogen, and nitrogen
B) Glyceraldehyde is a monosaccharide containing three carbon atoms
C) The carbohydrates present in plant organisms have only a structural function
D) Ribose and deoxyribose are six-carbon sugars
E) Galactose is a disaccharide formed by the union of one molecule of glucose and one of lactose

32. What is collagen, the most abundant molecule in the extracellular matrix of most animal cells?
A) A protein
B) A steroid
C) A triglyceride
D) A polysaccharide
E) A glycolipid

33. Which of the following sequences correctly orders the cited organic compounds by increasing oxidation state?

A) Aldehyde, carboxylic acid, alcohol
B) Alcohol, carboxylic acid, aldehyde
C) Aldehyde, alcohol, carboxylic acid
D) Alcohol, aldehyde, carboxylic acid
E) Carboxylic acid, alcohol, aldehyde

34. What is the molecular formula of an alkane with n carbon atoms?

A) C_nH_{2n+2}
B) C_nH_{2n}
C) C_nH_{2n-2}
D) C_nH_{n+2}
E) C_nH_n

35. Benzene is:

A) An aromatic hydrocarbon with 5 carbon atoms
B) A saturated hydrocarbon with 6 carbon atoms
C) An aromatic hydrocarbon with 6 carbon atoms
D) A non-aromatic hydrocarbon with 6 carbon atoms
E) An aromatic compound that is not a hydrocarbon with 6 carbon atoms

36. According to Lewis theory, a base is a substance that can:

A) Donate a lone pair of electrons
B) Accept a lone pair of electrons
C) Donate an electron
D) Accept an electron
E) Form an ionic bond

37. The triple point of a substance is a particular thermodynamic state determined by values of pressure and temperature at which:

A) Sublimation occurs
B) The solid, liquid, and vapor phases coexist in equilibrium
C) It is impossible to liquefy the gaseous state by simple compression
D) In the presence of vapor, the solid floats on the liquid
E) The substance has maximum density

38. Which of the following chemical elements is an alkaline earth metal?

A) Barium
B) Boron
C) Potassium
D) Lithium
E) Sulfur

39. A strong acid dissolved in water:

A) Dissociates completely
B) Dissociates only partially
C) Is completely undissociated
D) Has a very small acid dissociation constant (Ka)
E) Produces a solution with pH > 7

40. CH3-CH2-NH-CH2-CH3

A) Is a primary amine
B) Is a secondary amine
C) Is a tertiary amine
D) Is an amide
E) Is an azide

41. Phenol:

A) Is a weak acid
B) Is a weak base
C) Is an aromatic hydrocarbon and therefore neutral
D) Is an aromatic hydrocarbon with 5 carbon atoms
E) Is an aromatic hydrocarbon that contains an aldehyde group

42. Balance the following reaction:

$$SiO_2 + HF \Rightarrow H_2O + SiF_4$$

A) 1, 4, 2, 1
B) 2, 4, 2, 1
C) 1, 8, 4, 2
D) 2, 4, 2, 4
E) None of the other answers is correct

43. ZnO in aqueous solution:

A) Acts as a base in acidic pH and as an acid in basic pH
B) Acts as an acid in acidic pH and as a base in basic pH
C) Acts as a base in both acidic and basic pH
D) Acts as an acid in both acidic and basic pH
E) Does not undergo acid-base reactions

44. An example of an acid is:

A) NaCl
B) KOH
C) HClO
D) NaOH
E) $Ca(OH)_2$

45. How many structural isomers of the molecule C_4H_9Br exist?
A) 6
B) 2
C) 3
D) 5
E) 4

46. If an aqueous solution of H_2SO_4 has a molarity of 2 M, what is its normality?

A) 4 N
B) 2 N
C) 1 N
D) 3 N
E) 6 N

47. Which of the following compounds is traditionally named chloric anhydride?

A) Cl_2O_5
B) Cl_2O_7
C) Cl_2O
D) Cl_2O_3
E) ClO_3

48. The solutions of the inequality are the real numbers x such that:

$$\frac{(x^2+4)(x-3)^2}{(x-1)} \geq 0$$

A) $x > 1$
B) $1 < x \leq 3$
C) $x \geq 3$
D) $x \leq -2$ o $2 < x \leq 3$
E) None of the other answers is correct

49. The equation has among its solutions:

$$x^3 - 2x^2 - x - 6 = 0$$

A) -3
B) −1
C) 1
D) 3
E) None of the other answers is correct

50. The number $(2)^{3/4}$ is equal to:

$$1 < x \leq 3$$

A) $\sqrt[4]{2^3}$
B) $\sqrt[3]{2^4}$
C) 16^3
D) $2\sqrt[3]{2}$
E) 8^3

51. The conic of the equation is: $2x^2 + 2y^2 - 3x - 4y - 6 = 0$
A) A parabola
B) A circle
C) An ellipse, which is not a circle
D) A hyperbola
E) A pair of lines

52. The repeating decimal number $2,\overline{95}$ is equal to:

A) 295/99
B) 293/99
C) 293/90
D) 295/90
E) 293/9

53. Rolling a six-sided die twice, what is the probability of getting a 5 or a 6 at least once?

A) 22/36
B) 24/36
C) 20/36
D) 11/36
E) 12/36

54. What is the term for the direct transition of a substance from solid to gas?

A) Fusion
B) Evaporation
C) Condensation
D) Sublimation
E) Deposition

55. Which of the following is NOT a characteristic of an ideal gas?

A) It consists of distinguishable molecules from one another
B) It consists of point-like molecules, i.e., of negligible volume
C) Collisions between gas molecules and container walls are elastic
D) There are no interaction forces at a distance between gas molecules
E) The motion of molecules is disordered, and their velocities are randomly distributed in all directions

56. Given a current-carrying copper wire, what happens to a magnetic needle placed near it?

A) It aligns along the wire
B) It aligns perpendicular to the magnetic field generated by the wire
C) It remains stationary
D) It aligns in the direction of the Earth's magnetic field
E) It aligns in the direction of the magnetic field generated by the wire

57. Which physical law is the principle of voltage transformers based on?

A) Faraday's Law
B) Gauss's Theorem
C) Coulomb's Law
D) Kirchhoff's Laws
E) Ohm's Laws

58. The trajectory of a material point is defined as:

A) The law that provides the position of the material point as a function of time
B) The locus of points occupied by the material point during its motion
C) The segment joining the initial and final positions of the material point
D) The curve describing the velocity over time
E) The slope of the time graph

59. What is the average acceleration of a Ferrari SF90 that accelerates from 0 to 100 km/h in 2.5 seconds?

A) Approximately 40 m/s^2
B) Approximately 11 m/s^2
C) Approximately 16 m/s^2
D) Approximately 9.8 m/s^2
E) Approximately -40 m/s^2

60. A body of volume V is immersed in a liquid. If the body sinks, which of the following relationships between the specific weight of the body (PC) and the specific weight of the liquid (PL) is correct?

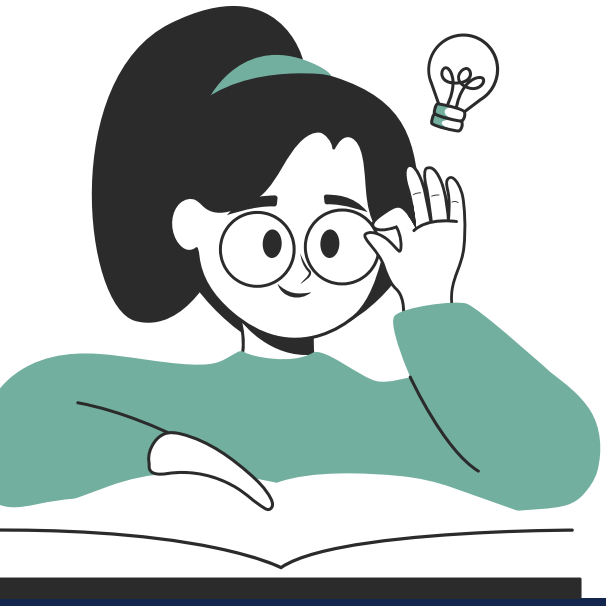
A) $P_c > P_L$
B) $P_c < P_L$.
C) $P_c = P_L$
D) $9.81 \cdot P_c = P_L$
E) $V \cdot P_c = P_L$

• Answer

Total Points: ...../90

Correct answer:...../60
Wrong answer:...../60
Unanswered:...../60

Correct answer: +1.5 points
Wrong answer: -0.4
Unanswered: 0 points



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