IMAT 2025
PROGRAM

TEST DI MEDICINA 2020 EXAM

TRANSLATED BY :
LOCOMOTIVE Group

PREPARED FOR :
IMAT Candidates

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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.
- **Mentor program**: Access to expert guidance and answers to your questions.
- **Review Classes**: Live or recorded classes to revisit and clarify challenging topics.

A PLAN FOR THE 17TH OF SEPTEMBER

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The Italian Ministry of Education administers the TOLC-MED test twice a year. 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, students should practice with the TOLC-MED tests. We recommend that students solve tests from at least the past five years.

01 LOGIC

22 Questions
All types of question

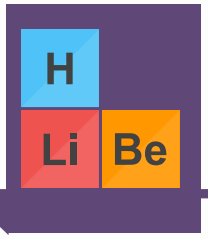
02 GK

22 Questions
All types of questions

03 BIOLOGY

18 Questions
All topics

04 CHEMISTRY

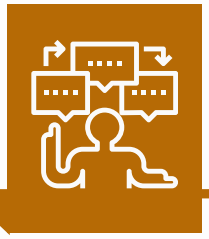


12 Questions
All topics

05 PHYSICS

8 Questions
All topics

06 MATH



8 Questions
All topics

1. Who is the author of the fantasy novel The Lord of the Rings?

A) John R. R. Tolkien
B) Joanne K. Rowling
C) Clive S. Lewis
D) Vladimir D. Nabokov
E) Isaac Asimov

2. Which of the following is not a work by Sigmund Freud?

A) The Interpretation of Dreams
B) Beyond Good and Evil
C) Totem and Taboo
D) The Ego and the Id
E) Introduction to Narcissism

3. Which term matches the following definition: "A soldier who voluntarily practices the profession of arms, offering his services for pay to whoever temporarily recruits him"?

A) Conspirator
B) Assassin
C) Janissary
D) Mercenary
E) Plotter

4. Article 76 of the Constitution of the Italian Republic states:

"The exercise of legislative power may not be delegated to the ..... except with the determination of guiding principles and criteria, and only for a limited time and for defined purposes."
Which of the following correctly completes the article?

A) Government
B) President of the Republic
C) High Council of the Judiciary
D) Prime Minister
E) Minister of Justice

5. Which of the following pairs is not made up of synonyms?

A) Mirage – Fata Morgana
B) Rough – Smooth
C) Clear – Silvery
D) Strait – Channel
E) Strong – Bastion

6. Who is considered the founder of scientific medicine in Greece?

A) Leucippus
B) Epicurus
C) Aesculapius
D) Hippocrates
E) Pericles

7. If it is 19:00 (7 p.m.) on 4 September 2020 in Rome, in which of the following cities is it already 5 September 2020?

A) Seoul
B) Baku
C) Bombay (Mumbai)
D) Lima
E) Cape Town

8. In our hemisphere, summer began on 20 June. On that day, where was the sun at the zenith?

A) Equator
B) South Pole
C) Tropic of Cancer
D) Tropic of Capricorn
E) North Pole

9. Who designed and led the construction of the first nuclear fission reactor, which produced the first controlled chain nuclear reaction?

A) Niels Bohr
B) Julius Robert Oppenheimer
C) Marie Curie
D) Albert Einstein
E) Enrico Fermi

10. Which of the following sequences gives the correct chronological order of the last four Presidents of the Italian Republic?

A) Mattarella – Ciampi – Napolitano – Scalfaro
B) Mattarella – Scalfaro – Ciampi – Napolitano
C) Mattarella – Napolitano – Ciampi – Scalfaro
D) Mattarella – Napolitano – Scalfaro – Ciampi
E) Mattarella – Ciampi – Scalfaro – Napolitano

11. Which author, in his works on robots, stated his “Three Laws of Robotics”?

First Law: A robot may not injure a human being, or, through inaction, allow a human being to come to harm.

Second Law: A robot must obey the orders given it by human beings, except where such orders would conflict with the First Law.

Third Law: A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

A) Isaac Asimov
B) John R. R. Tolkien
C) Joanne K. Rowling
D) Clive S. Lewis
E) Vladimir D. Nabokov

12. The severe acute respiratory syndrome due to coronavirus was first recorded in China in 2002. What is the common name for the infection caused by this coronavirus?

A) MERS
B) HIV
C) SARS
D) EBOLA
E) Spanish flu

13. Which of the following words has a semantic link with both “prompt” and “police”?

A) Swift/ Rapid (celere in italian)
B) Caring
C) Sirens
D) Fast
E) Unit

14. Unlike the other swimming pools in Nice, in 2019 the Thalasso pool increased registrations compared to 2018. The reason for this increase was the introduction of hydrospinning courses. Which of the following conclusions cannot be deduced from this statement?

A) In 2018, Thalasso did not offer hydrospinning courses
B) The introduction of hydrospinning courses was decisive in increasing registrations at Thalasso
C) All other pools in Nice recorded a decrease in registrations in 2019 compared to 2018
D) In 2019, no pool in Nice, except Thalasso, saw an increase in registrations
E) In 2019, at least one pool in Nice saw an increase in registrations compared to the previous year

15. In how many ways can Enea modify the Japanese flag (white background with a red circle in the center) by using an additive primary color (Red, Green, or Blue) for the circle and white or black for the background?

A) 6
B) 5
C) 11
D) 12
E) 8

16. Let m = (n + 1)(n + 2)(n + 3) be a three-digit number and n a natural number. For how many values of n is m divisible by 7?

A) 2
B) 5
C) 3
D) 4
E) 6

17. Nicolò, Giorgio, and Enea are three friends; two of them were born in Rome. Knowing that: if Nicolò was born in Rome, then Giorgio was also born in Rome; if Enea was born in Rome, then Nicolò was born in Rome; and that one of Enea and Giorgio was born in Milan, it can be deduced that:

A) Giorgio and Nicolò were born in Rome
B) Enea was born in Rome, Giorgio in Milan
C) All three friends were born in Rome
D) Nicolò was born in Milan, Enea in Rome
E) Giorgio was born in Rome, Nicolò in Milan

18. Enea and his friends, fewer than ten people in total, go to a restaurant with a fixed-price menu: a meat main course costs €11, a fish main course costs €13. If Enea and his friends spent €107 on main courses, how many fish dishes did they order?

A) 9
B) 5
C) 2
D) 4
E) 7

19. Processed gold contains 75% gold, with the remainder being metals that increase its rigidity and vary its color. Tommaso's jewelry shop is famous for green gold rings made with 12.5% copper and 12.5% silver. If Tommaso has in stock 12 g of silver, 28 g of copper, and 60 g of gold, how many grams of green gold can he produce at most?

A) 96
B) 74
C) 80
D) 72
E) 88

20. In the "Friends of Opera" club, where Alice is the new president, each member has the right to vote. Alice received three times as many votes as the other candidate and was elected with exactly 66% of the votes of eligible members. Knowing that 18 members did not vote and that there were no blank or invalid ballots, what is the number of club members?

A) 114
B) 132
C) 150
D) 166
E) 128

21. Paper size indicates the dimensions (length and width) of a sheet. The international standard, ISO 216, provides for a ratio of $\sqrt{2}$ between length and width. The initial size is called A0; subsequent sizes (A1, A2, A3, ...) are obtained by halving the previous format along the longer side. Referring to the initial length LU and width LA of the A0 format, which of the following fractions corresponds to the length of the A4 format?

A) LA/4
B) LU/4
C) LA/2
D) LU/8
E) LA/8

22. Defined on the set of real numbers, the operator ◊ is given by the relation: a ◊ b = ab − a − b, What is the value of: (a ◊ b) ◊ c − (a ◊ c) ◊ b?

A) a + bc
B) a - 2ac
C) 2b - 2c
D) 2c + ab
E) b + 2c

23. Eosinophil granulocytes are:

A) Platelets
B) Lymphocytes
C) Leukocytes
D) Produced by the nervous system
E) Produced by bone tissue

24. The nephron is:

A) An exocrine gland
B) The functional unit of the nervous system
C) The functional unit of the kidney
D) An endocrine gland
E) A gland associated with the male reproductive system

25. The capsid is:

A) The protein coat of viruses
B) The envelope of bacteria
C) The protein part of the plasma membrane of eukaryotic cells
D) Present only in eukaryotic cells
E) The protein part of the nuclear membrane

26. Which of the following structures belongs to the heart's conduction system?

A) The ascending aorta
B) The sinoatrial node
C) The superior vena cava
D) The tricuspid valve
E) The left coronary artery

27. Identify the incorrect statement:

A) The product of pancreatic secretion is released into the stomach
B) The pancreas has an exocrine function
C) The pancreas has an endocrine function
D) The secretion of pancreatic islet cells is released into the blood
E) The pancreas produces digestive enzymes

28. It is correct to say that in the spinal cord:

A) There are no meningeal coverings
B) Schwann cells wrap around the neuronal cell body
C) White matter consists mostly of motor neuron cell bodies
D) The dorsal horns of grey matter contain motor neuron cell bodies
E) Oligodendrocytes form the myelin sheath of axons

29. In their famous experiment, Hershey and Chase used radioactive isotopes ^{35}S and ^{32}P to determine whether genetic material was made of proteins or nucleic acids because:

A) ^{35}S is incorporated into viral capsid proteins and ^{32}P into viral nucleic acids
B) ^{35}S is incorporated into viral nucleic acids
C) ^{35}S is incorporated into viral nucleic acids and ^{32}P into viral capsids
D) Both isotopes are incorporated into viral nucleic acids
E) Both isotopes are incorporated into viral capsids

30. A woman with blood group O Rh− marries a man with blood group AB Rh+, heterozygous for the Rh factor. Which of the following could be their child's blood group?

A) O Rh−
B) AB Rh−
C) B Rh−
D) AB Rh+
E) O Rh+

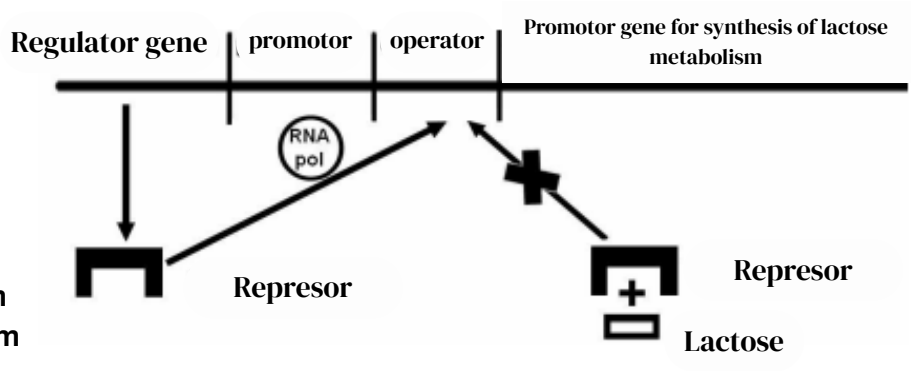
31. Anthocyanin pigments make vacuoles in certain flower petal cells visible in fresh samples. If two slides are prepared, one with a hypotonic solution and one with a hypertonic solution, the vacuole swells in the first and shrinks in the second. This phenomenon is due to:

A) Osmosis
B) Active transport
C) Simple diffusion
D) Facilitated diffusion
E) Movement against a concentration gradient

32. The nucleotide sequence AUG CCA UGG AAG AGA encodes the amino acids Met−Pro−Trp−Lys−Arg. A mutation replacing the ninth nucleotide guanine with adenine (G → A) would cause:

A) Substitution of Trp in the protein chain
B) Chain termination with Trp due to a stop codon
C) No change due to redundancy of the genetic code
D) Chain termination with Pro due to a stop codon
E) Loss of Lys in the chain

33. The lac operon in prokaryotes regulates lactase production. It produces lactase:



A) When lactose synthesis is needed
B) When lactose is absent in the medium
C) When lactose is present in the medium
D) Independently of lactose presence
E) When lactose is in excess

34. Restriction enzymes from bacteria are used in recombinant DNA technology. BamHI cuts DNA at:

G↓G—A—T—C—C
C—C—T—A—G↑G

5'...GGATCC...3'
3'...CCTAGG...5'
When used to cut the sequence:
5'...ATGGATCCGGACTAA...3'
3'...TACCTAGGCCGGATT...5'

How many DNA fragments are formed?

A) 2 with sticky ends
B) 2 with blunt ends
C) 3 with sticky ends
D) None
E) 3 with blunt ends

35. In which phase of the cell cycle are adult human heart muscle cells found?

A) G1
B) M
C) G0
D) S
E) G2

36. At the end of the first meiotic division:

A) Homologous chromosomes separate
B) Sister chromatids separate
C) Four haploid cells are formed
D) DNA replication occurs
E) Chromatids are identical to each other

37. Which pairing of cell structure and function is correct?

A) Cytoskeleton – Intracellular digestion
B) Smooth ER – Protein synthesis
C) Nucleolus – Synthesis of rRNA
D) Golgi apparatus – Cell movement
E) Lysosomes – Cellular respiration

38. Which of the following organelles is not a part of the endomembrane system?

A) Mitochondrion
B) Rough ER
C) Smooth ER
D) Golgi apparatus
E) Lysosomes

39. Which molecules produced during the light phase of photosynthesis are used in the Calvin cycle?

A) CO_2 and ADP
B) Sugars and H_2O
C) ATP and NADPH
D) NADPH and O_2
E) H_2O and O_2

40. In terrestrial plants, root cells do not contain:

A) Chloroplasts
B) Mitochondria
C) Cell membrane
D) Vacuole
E) Nucleus

41. Hausmannite ($MnO•Mn_2O_3$) is a mineral from which it is possible to obtain manganese in metallic form according to the following reaction:

$aMnO•Mn_2O_3 + bAl \rightarrow cAl_2O_3 + dMn$

Which of the following combinations of stoichiometric coefficients – a, b, c, d – should be used to balance the reaction?

A) a = 3; b = 4; c = 8; d = 9
B) a = 1; b = 4; c = 2; d = 3
C) a = 2; b = 4; c = 2; d = 6
D) a = 3; b = 8; c = 4; d = 9
E) a = 3; b = 6; c = 3; d = 6

42. What will be the molar concentration (M) of a $Sr(OH)_2$ solution that has a pH equal to 12?

A) 5×10^{-2} M
B) 5×10^{-3} M
C) 5×10^{-12} M
D) 2 M
E) 0.1 M

43. Which of the following pairs of molecules is such that at least one member of the pair can establish permanent dipole–permanent dipole interactions with the other member?

A) H_2Se, F_2
B) O_2, H_2
C) H_2, H_2O
D) HCl, $CHCl_3$
E) F_2, Cl_2

44. A balloon containing 1.0 mole of helium gas at 25 °C is added with 3.0 more moles of helium. If the temperature remains constant and the balloon's volume doubles, how will the pressure change compared to the original pressure inside the same balloon?

A) The pressure will be half
B) The pressure will be doubled
C) The pressure will be four times greater
D) The pressure will be three times greater
E) The pressure will not change

45. Which statement about organic molecules is correct?

A) Amides contain the carbonyl group
B) Amides contain no nitrogen
C) Aldehydes lack a carbonyl group
D) Alcohols always have double covalent bonds
E) Alkenes always have triple carbon–carbon bonds

46. The electron configuration of the Li^+ ion is represented as:

A) $1s^1$
B) $1s^2\ 2s^1$
C) $1s^1\ 2s^2$
D) $1s^2$
E) $1s^1\ 2s^1\ 2p^1$

47. In which of the following compounds is the octet rule satisfied?

A) NF_3
B) BF_3
C) PF_5
D) NO
E) BrO_2

48. For which of these molecules can we predict an octahedral geometry?

A) PF_5
B) BrF_3
C) SeF_6
D) SF_4
E) BF_3

49. A combustion chamber contains 10 moles of H_2 and 7 moles of O_2. How many moles will be present in total after the explosion of this mixture?

A) 10
B) 12
C) 3
D) 17
E) 7

50. The most suitable flask for dissolving 10 g of NaOH (Molar mass = 40 g/mol) to obtain a 5.0 M solution will have a volume of:

A) 10 mL
B) 50 mL
C) 100 mL
D) 1 L
E) 5 L

51. Under appropriate conditions, the solubility product of $Zn(OH)_2$ is 1.2×10^{-17}. Which of the following statements is correct?

A) The solubility product of $Zn(OH)_2$ does not depend on temperature
B) The solubility product of $Zn(OH)_2$ does not depend on pH
C) The solubility of $Zn(OH)_2$ does not change if NaOH is added to the solution
D) The solubility product of $Zn(OH)_2$ changes if $ZnCl_2$ is added to the solution
E) The solubility of $Zn(OH)_2$ does not change if $ZnCl_2$ is added to the solution

52. The pH of a solution containing 0.4 M formic acid and 1.0 M sodium formate is 4.15. What will be the pH of the same solution if it is diluted 10-fold?

A) 4.15
B) 5.15
C) 3.15
D) 0.415
E) 4.05

53. In the isosceles triangle ABC, the median AM measures 5 cm and the tangent of angle ACB is 5/13. What is the length, in cm, of the base BC?

A) 10
B) 3
C) 13
D) 26
E) 18

54. To represent the graph of the equation $4x^2 - y^2 = 0$, what should be drawn?

A) A circle
B) A parabola
C) A pair of straight lines
D) A hyperbola
E) An ellipse

55. What are the solutions of the equation $4^x + 2^{3x} + 16 = 0$?

A) x = 0
B) All real numbers
C) x = 0 and x = 1
D) x = 2 and x = 1
E) The equation has no real solutions

56. What are the real solutions of the inequality |x - 1| < |x|?

A) $x > \frac{1}{2}$

B) $x < 0$ o $x > \frac{1}{2}$

C) $x > 0$

D) $x \neq 0$

E) $x < \frac{1}{2}$

57. A point moves in the xy-plane, and its projections on the Cartesian axes follow the laws: $\begin{cases} x = 3t^2 \\ y = 4t^2 \end{cases}$ Which of the following statements about the motion of the point is true?

A) The motion is parabolic with a = 12 m/s^2
B) The motion is uniformly accelerated in a straight line with a = 5 m/s^2
C) The motion is uniform in a straight line with v = 10 m/s^2
D) The motion is uniform in a straight line with v = 5 m/s^2
E) The motion is uniformly accelerated in a straight line with a = 10 m/s^2

58. A spring has a spring constant of 8 N/m. What mass should be suspended from the spring so that it oscillates with a period T = 1s?

A) 0.6 kg
B) 0.2 kg
C) 2 kg
D) 1 kg
E) 5 kg

59. A gas has a volume of 3 m^3 and a pressure of 5 atm. If the temperature is kept constant, what will be the volume of the gas if a pressure of 15 atm is applied?

A) 3 m^3
B) 0.5 m^3
C) 1 m^3
D) 2 m^3
E) 5 m^3

60. Four capacitors C_1, C_2 of 8μF and 12μF respectively, are connected in series with each other, and in parallel with C_3 of 20μF and C_4 of 5 μF. What is the equivalent capacitance of the system?

A) 29.8 μF
B) 45 μF
C) 29.8 mF
D) 45 mF
E) 24.8 μF

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