

SAMPLE TEST

English TOLC-F

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BIOLOGY

1. The RNA is composed by:
 - A. amino acids
 - B. fatty acids
 - C. nucleotides
 - D. vitamins and carboxylic acids
 - E. carbohydrates

2. Fatty acids are made up by:
 - A. hexoses and pentoses
 - B. hydrocarbon chains
 - C. long amino acid chains
 - D. triglycerides
 - E. acetic acid and uric acid

3. Bacteria are:
- A. filamentous only
 - B. algae
 - C. eukaryotes
 - D. unicellular
 - E. multicellular
4. Two subsequent cycles of cell division not separated by a phase of DNA synthesis are termed:
- A. interphase
 - B. anaphase
 - C. meiosis
 - D. mitosis
 - E. double mitosis

5. The male reproductive organs in the flower are termed:

- A. sepals
- B. stomata
- C. pistils
- D. stamens
- E. petals

6. Mitochondria are important:

- A. in cellular respiration
- B. in protein synthesis
- C. in fagocytosis
- D. in cellular secretion
- E. in cellular digestion

7. If in a cell the ribosome function is selectively blocked, what is immediately stopped?
- A. Translation
 - B. Transcription
 - C. Glycolysis
 - D. DNA replication
 - E. Respiration
8. Consider a phospholipid made up by a head and two tails. Which of the following statements is not correct?
- A. The head contains a phosphate group
 - B. The head contains a molecule of glycerol
 - C. The head is always positively charged
 - D. Tails are hydrophobic
 - E. The head is hydrophilic

9. The advantage of sexual reproduction:
- A. is due to the fact that it has allowed the diffusion of plants on dry lands
 - B. is due to the fact that it happens more frequently than asexual reproduction
 - C. does not exist
 - D. is due to the fact that it increases the genetic variability of organisms
 - E. is less than that given by asexual reproduction
10. The process by which an inheritable change is made in a gene is termed:
- A. splicing
 - B. mutation
 - C. transduction
 - D. alternative splicing
 - E. nick translation

11. Which is the product of anaerobic glycolysis from a glucose molecule?
- A. 3 molecules of lactic acid
 - B. 2 molecules of glycerol
 - C. 2 molecules of piruvic acid
 - D. One molecule of citric acid
 - E. 3 molecules of acetyl coenzyme A
12. The terminal section of the large intestine is:
- A. descending colon
 - B. duodenum
 - C. rectum
 - D. cecum
 - E. pylorus

13. In the circulatory system there are, in order:
- A. heart, vessels for distribution, exchange, and collection
 - B. heart, vessels for distribution, collection, and exchange
 - C. heart, vessels for exchange, distribution, and collection
 - D. vessels for distribution, heart, and vessels for collection
 - E. heart, vessels for collection, distribution, and exchange
14. Blood reaches the left atrium:
- A. from aorta
 - B. with low oxygen
 - C. very rich in oxygen
 - D. from the inferior vena cava
 - E. rich in carbon dioxide

15. Steroid hormones:

- A. are produced in the medulla of the adrenal gland and in the thyroid
- B. are exclusively testosterone and progesterone
- C. are produced in the pancreas
- D. are produced exclusively in the gonads
- E. are produced in the cortex of the adrenal gland, in the gonads and in the placenta

CHEMISTRY

16. Two electrons that share the same orbital have
- A. different speeds
 - B. different principal quantum numbers
 - C. different masses
 - D. different angular quantum numbers
 - E. different spin quantum numbers
17. Which of the following solutions has the lowest value of pH?
- A. HCl 0,01 M
 - B. NaOH 0,1 M
 - C. HCl 0,2 M
 - D. HCl 0,8 M
 - E. HCl 0,1 M

18. The ideal gas law is valid for
- A. gases dissolved in water
 - B. small molecules
 - C. one mole of a gas
 - D. non-interacting point-like molecules
 - E. inert gases
19. In which of the following substances bonds are mainly due to electrostatic forces?
- A. Sodium chloride
 - B. Hydrochloric acid
 - C. Sodium
 - D. Diamond
 - E. Br_2

20. The chemical properties of an atom are determined by

- A. its atomic mass
- B. its atomic number
- C. its mass number
- D. the number of its neutrons
- E. its metallic properties

21. The molecular formula of hydrogen sulphide is

- A. H_2S
- B. HNO_3
- C. H_2SO_3
- D. H_2SO_4
- E. HNO_2

22. What is meant by the term orbital?
- A. The area (around the nucleus) where it is most likely to find an electron
 - B. The maximum distance from the nucleus of an electron in the highest energy orbit
 - C. A circle around the atom
 - D. The position of an electron
 - E. The orbit of the electron around the nucleus
23. The compound KH is called
- A. krypton hydroxide
 - B. potassium hydrate
 - C. potassium hydride
 - D. potassium hydroxide
 - E. potassium hydronium

24. A millimole
- A. a unit of measurement for mass
 - B. 1000 moles
 - C. is equivalent to 10^3 moles
 - D. is equivalent to 10^{-3} moles
 - E. 0,01 moles
25. Which of the following particles are transferred during redox reactions?
- A. Neutrons
 - B. Electrons
 - C. Protons
 - D. Nucleons
 - E. Neutrinos

26. In the semi-reaction $\text{Cu}^{2+} + 2\text{e}^{-} \rightarrow \text{Cu}$, the copper
- A. undergoes oxidation
 - B. undergoes reduction, because it gains two electrons
 - C. does not undergo reduction nor oxidation
 - D. loses two electrons
 - E. undergoes both oxidation and reduction at the same time
27. What does organic chemistry deal with?
- A. Carbon compounds
 - B. The processes going on in animal organs
 - C. The relations between chemistry, animals and vegetals
 - D. The relations between chemistry and minerals
 - E. Nitrogen compounds

28. Which of the following substances is a strong acid?
- A. Carbonic acid
 - B. Acetic acid
 - C. Oleic acid
 - D. Hydrochloric acid
 - E. Sodium hydroxide
29. Water molecules are
- A. non-polar
 - B. none of the answers above is correct
 - C. polar
 - D. completely dissociated into ions
 - E. acid
30. In alkanes, the chemical bonds between carbon atoms are
- A. some π -bonds, some other σ -bonds
 - B. all π -bonds
 - C. all σ -bonds
 - D. not enough information to answer
 - E. dative bonds

MATHEMATICS

31. The expression $4 \times 10^0 + 5 \times 10^1 + 3 \times 10^2 + 7 \times 10^3$ is equal to
- A. 4.735
 - B. 7.354
 - C. 4.537
 - D. 4.530
 - E. 7.350
32. For which values of x is the inequality $x^2 > 36$ satisfied?
- A. $x > -6$
 - B. $x < -6$ or $x > 6$
 - C. $x > 6$
 - D. $x > 36$
 - E. $-6 < x < 6$

33. The cosine of a 110° angle is
- A. negative
 - B. greater than $1/2$
 - C. greater than the sine of a 110° angle
 - D. positive
 - E. equal to the cosine of a 290° angle
34. Can the logarithm in base 10 of a real number be negative?
- A. Yes, if the number is negative
 - B. No, never
 - C. Yes, if the number is smaller than $1/10$
 - D. Yes, if the number is smaller than the base (10)
 - E. Yes, if the number is positive and smaller than 1

35. A quadrilateral can be inscribed in a circumference if and only if
- A. its adjacent angles are complementary
 - B. the sum of its opposite angles is 120°
 - C. its opposite angles are complementary
 - D. its adjacent angles are supplementary
 - E. its opposite angles are supplementary
36. A curve has equation $y^2 = x + 24$. Find the coordinates of the points of intersection between this curve and the straight line $x = 1$.
- A. $(1, 5/2)$ and $(1, -5/2)$
 - B. $(1, 5/4)$ and $(1, -5/4)$
 - C. $(1, 25)$ and $(1, -25)$
 - D. $(1, 5)$ and $(1, -5)$
 - E. $(5, 1)$ and $(-5, 1)$

37. The arithmetic mean of the numbers 3, 4, 5, 6, 7 is

A. 3

B. 1

C. 5

D. 0

E. 2

PHYSICS

38. The prefix mega denotes a factor of
- A. 10^9
 - B. 10^{-3}
 - C. 10^6
 - D. 10^{-6}
 - E. 10^{-9}
39. Stevin's law allows us to find
- A. the bend radius in a uniform circular motion
 - B. the attractive force between two liquid bodies
 - C. the centripetal acceleration in a parabolic motion
 - D. the pressure exerted by a fluid column at a given depth
 - E. the relative distance between two bodies in uniform accelerated motion

40. Newton's third law of motion states that
- A. if one body exerts a force on a second body, the second body simultaneously exerts a force equal in magnitude and opposite in direction on the first body.
 - B. the vector sum of forces on a body moving at constant velocity is zero
 - C. a body subject to a force gains an acceleration proportional to such force
 - D. weight is a conservative force
 - E. a body either remains at rest or continues to move at a constant velocity, unless acted upon by a force

41. 2 kg of water at 80°C are put into a calorimeter that contains 1 kg of water at 20°C . After some time, what equilibrium temperature is reached in the calorimeter?

A. 30°C

B. 33°C

C. 50°C

D. 20°C

E. 60°C

42. The voltage across the terminals of a 150 ohm resistor is 15 V. Thus the current flowing through the resistor is

A. 1 mA

B. 0,1 mA

C. 0,1 A

D. 10 A

E. 1 A

43. The Avogadro number is the number of molecules contained in
- A. 1 mole
 - B. 1 mm³
 - C. 1 m³
 - D. 1 cm³
 - E. 1 dm³
44. Consider a body in uniform rectilinear motion. Then we can state that
- A. its velocity is constant
 - B. the force applied to the body is constant
 - C. its acceleration is variable
 - D. its acceleration is constant and non-zero
 - E. its speed is zero

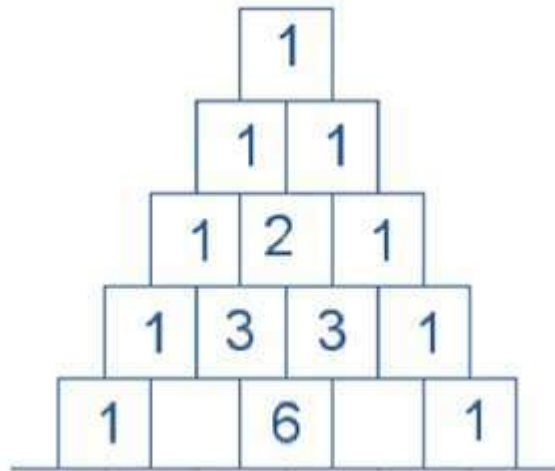
LOGIC

45. Find the next number in the following numerical sequence:

22 – 29 – 25 – 32 – 28 – ?

- A. 32
- B. 35
- C. 39
- D. 38
- E. 29

46. Which pair of numbers completes the following figure?



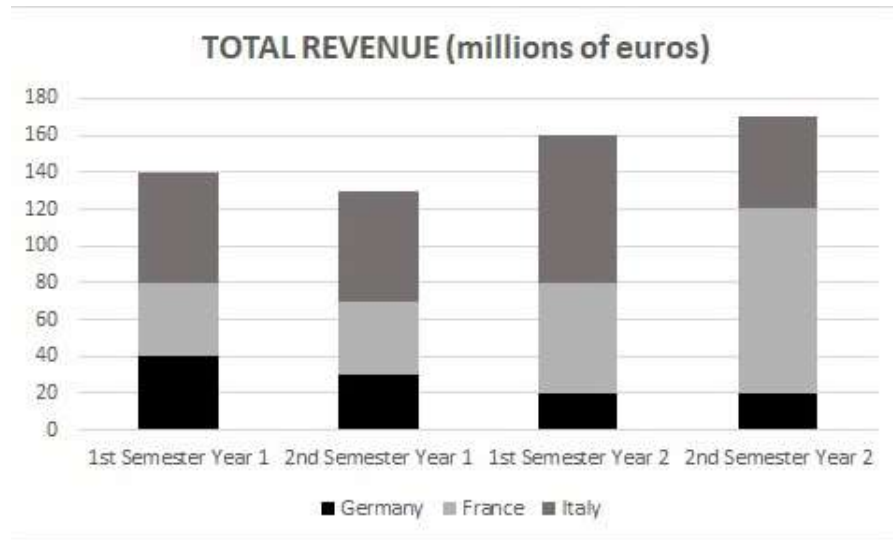
- A. 4 and 4
- B. 5 and 4
- C. 4 and 6
- D. 4 and 3
- E. 5 and 5

47. Complete the following sequence using the English alphabet (i.e. J, K, W, X, Y are included):

V; Q; M; J; E; A; ?

- A. V
- B. I
- C. X
- D. N
- E. P

48. How much has been the total revenue in Italy and Germany (France excluded) in the second semester of the first year?



- A. Around 130 million euros
- B. Around 70 million euros
- C. Around 40 million euros
- D. Around 90 million euros
- E. Around 60 million euros

49. Which of the following is a correct deductive reasoning?
- A. If Anne went to the gym, and if all the other girls in the gym had brown hair, then Anne would also have brown hair.
 - B. Anne is 6 years old. Girls who are older than 6 are brown-haired. Therefore Anne does not have brown hair.
 - C. Anne is 6 years old. All 6-years-old girls are brown-haired. Therefore Anne has brown hair.
 - D. Anne is 6 years old. Girls who are older than 6 are not brown-haired. Therefore Anne has brown hair.
 - E. Anne goes to the gym. The majority of girls who go to the gym are brown-haired. Therefore Anne has brown hair.
50. Three chefs can peel one potato sack in 1, 2, and 4 hours respectively. How many hours will it take to peel 21 potato sacks, if they work together?
- A. 12 hours
 - B. 10 hours
 - C. 7 hours
 - D. 3 hours
 - E. 6 hours

Question	Correct Answer
1	C
2	B
3	D
4	C
5	D
6	A
7	A
8	C
9	D
10	B
11	C
12	C
13	A
14	C
15	E
16	E
17	D
18	D
19	A
20	B
21	A
22	A
23	C
24	D
25	B
26	B
27	A
28	D

29	C
30	C
31	B
32	B
33	A
34	E
35	E
36	D
37	C
38	C
39	D
40	A
41	E
42	C
43	A
44	A
45	B
46	A
47	C
48	D
49	C
50	A