

TEST A - CHEMISTRY		
Question:	Answer:	<input checked="" type="checkbox"/>
1. An element with atomic number 1 and mass number 3 represents:	1) only A is valid	
A) Tritium	2) only E is valid	
B) an hydrogen isotope with 1 proton and 2 neutrons	3) only B is valid	
C) and hydrogen isotope with 3 neutrons	4) A, B are valid	
D) an element with 3 protons	5) A, C are valid	
E) Lithium	6) D, E are valid	
2. What is the approximate pH value of a HNO ₃ solution of concentration 0.003 mol/dm ³ ?	1) only A is valid	
A) pH < 1.0	2) only C is valid	
B) pH < 3.0	3) B, C are valid	
C) pH > 2.0	4) B, D are valid	
D) pH = 3.0	5) B, E are valid	
E) pH < 2.0	6) no answer is valid	
3. Consider the following structures: CH ₃ OCH ₃ (methyl ether) and CH ₃ CH ₂ OH (ethanol). Which of the following statements are true?	1) A, E are valid	
A) both compounds have the same properties	2) B, D are valid	
B) both compounds are geometric isomers	3) B, E are valid	
C) both compounds are at liquid state in normal conditions	4) C, D are valid	
D) the molecular formula of both compounds is C ₂ H ₆ O	5) A, B, C are valid	
E) both compounds are structural isomers	6) D, E are valid	
4. What is the concentration of KOH in a solution of volume 1500 cm ³ , which contains 8.4 grams of KOH? (K = 39)	1) A, C are valid	
A) 5.6%	2) A, D are valid	
B) 0.56%	3) B, C are valid	
C) 100 mmol/dm ³	4) B, D are valid	
D) 125 mmol/dm ³	5) only D is valid	
E) 0.84 %	6) no answer is valid	
5. In the periodic table:	1) A, E are valid	
A) elements are listed horizontally in order of their atomic number	2) C, D are valid	
B) electronegativity increases from top to bottom	3) A, B, E are valid	
C) the elements in the centre section are called transition elements	4) B, C, D are valid	
D) nonmetals are mostly listed on the right side of the periodic table	5) all answers are valid	
E) information about the atomic mass may be indicated	6) no answer is valid	

6. The pancreatic juice has the pH value between 7.5 and 8.0. The following statements are true :	1) A, B are valid	
A) It is a neutral solution.	2) B, D are valid	
B) Its pH value is higher than pH in stomach.	3) D, E are valid	
C) It is a strong basic solution.	4) only B is valid	
D) It is a weak basic solution.	5) only D is valid	
E) Its pH is lower than pH in stomach.	6) no answer is valid	
7. An acid can be defined as:	1) all answers are valid	
A) a hydrogen containing substance that produces hydrogen ions in aqueous solution	2) no answer is valid	
B) a hydroxyl group (OH ⁻) donor	3) A, B, C, D are valid	
C) any species that will bond to an unshared pair of electrons	4) only A is valid	
D) an electron pair acceptor	5) A, C, D are valid	
E) a proton (H ⁺) acceptor	6) B, D are valid	
8. Which of the following compounds form covalent bonds?	1) A, C, D, E are valid	
A) O ₂	2) A, C, E are valid	
B) NaCl	3) C, D are valid	
C) CH ₄	4) C, E are valid	
D) HCl	5) only C is valid	
E) N ₂	6) all answers are valid	
9. Given balanced equation $\text{CaCO}_3 + \text{HCl} \rightarrow \text{CaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$. How many liters of gas were formed in normal conditions if 2 moles of H ₂ O were formed? (Ca = 40, Cl = 35.5)	1) no answer is valid	
A) 67.2 l	2) only A is valid	
B) 44.2 l	3) only B is valid	
C) 44.8 l	4) only C is valid	
D) 66.1 l	5) only D is valid	
E) 50.8 l	6) only E is valid	
10. What is the oxidation number of nitrogen in H ₂ N-COONH ₄ ?	1) A, C are valid	
A) +2	2) A, D are valid	
B) +3	3) B, C are valid	
C) +4	4) B, D are valid	
D) +5	5) only D is valid	
E) +6	6) no answer is valid	

11. In the isotope of carbon ^{14}C the number of protons, neutrons and electrons is:	1) only A is valid	
A) 12p, 2n, 14e	2) only B is valid	
B) 6p, 8n, 14e	3) only C is valid	
C) 14p, 2n, 14e	4) only D is valid	
D) 14p, 2n, 6e	5) only E is valid	
E) 6p, 8n, 6e	6) no answer is valid	
12. Ten ml of NaOH ($c = 0.6 \text{ mol/dm}^3$) was neutralized by 20 ml of H_3PO_4 . What was the concentration of acid in mol/dm^3 ? (Na = 23; P = 31)	1) only A is valid	
A) 0.3 mol/dm^3	2) only B is valid	
B) 0.1 mol/dm^3	3) only C is valid	
C) 0.6 mol/dm^3	4) only D is valid	
D) 0.4 mol/dm^3	5) only E is valid	
E) 0.7 mol/dm^3	6) no answer is valid	
13. How many milliliters of 6% (w/v) NaCl do you need to prepare 750 ml of 4% (w/v) NaCl? (Na = 23; Cl = 35.5)	1) only A is valid	
A) 750 ml	2) only B is valid	
B) 700 ml	3) only C is valid	
C) 650 ml	4) only D is valid	
D) 600 ml	5) only E is valid	
E) 500 ml	6) no answer is valid	
14. Catalysts:	1) A, C are valid	
A) decrease the activation energy	2) B, C are valid	
B) increase the activation energy	3) B, C, D are valid	
C) are present in living organisms, and are called enzymes	4) only A is valid	
D) interact with reactants	5) only E is valid	
E) change the equilibrium constant	6) no answer is valid	
15. Which of the following statements about lipids are true?	1) no answer is valid	
A) Lipids include substances like: fats, phospholipids and steroids.	2) B, C are valid	
B) Lipids are insoluble in water.	3) B, D are valid	
C) Lipids are insoluble in organic solvents.	4) A, B, C are valid	
D) Lipids are soluble in organic solvents.	5) A, B, D are valid	
E) Lipids are compounds containing elements: carbon, hydrogen, nitrogen.	6) A, B, C, E are valid	

16. 300 ml of 0.5 mol/dm ³ KNO ₃ solution was diluted with water to a final volume of 1.5 dm ³ . What is the molar concentration of the new solution? How many grams of KNO ₃ is in the solution? (K=39; N=14)		
A) molar conc. = 100 mmol/dm ³ ; KNO ₃ = 15.15 g	1) A, B are valid	
B) molar conc. = 0.1 mol/dm ³ ; KNO ₃ = 15.15 g	2) B, C are valid	
C) molar conc. = 1000 mmol/dm ³ ; KNO ₃ = 15.15 g	3) C, D are valid	
D) molar conc. = 0.1 mol/dm ³ ; KNO ₃ = 1.515 g	4) D, E are valid	
E) molar conc. = 0.1 mmol/dm ³ ; KNO ₃ = 1.515 g	5) only B is valid	
	6) no answer is valid	
17. What is the molar and percentage concentration of 400 ml solution containing 7.5 g of NaCl? (Na=23; Cl=35.5)	1) only A is valid	
A) molar conc. = 32 mmol/dm ³ ; % conc. = 1.88%	2) only B is valid	
B) molar conc. = 3.2 mol/dm ³ ; % conc. = 18.8 %	3) only C is valid	
C) molar conc. = 3.2 mol/dm ³ ; % conc. = 1.88%	4) only D is valid	
D) molar conc. = 0.32 mol/dm ³ ; % conc. = 1.88%	5) A, D are valid	
E) molar conc. = 320 mmol/dm ³ ; % conc. = 0.188 %	6) no answer is valid	
18. Which of the following amino acids do not contain sulfur ?	1) all answers are valid	
A) Tyrosine	2) A, B, C are valid	
B) Serine	3) A, B, E are valid	
C) Methionine	4) B, D are valid	
D) Cysteine	5) only C is valid	
E) Tryptophan	6) only D is valid	
19. ATP can be defined as:	1) only D is not valid	
A) a nucleotide formed by a ribose, adenine base and 3 molecules of phosphoric acid	2) A, D are valid	
B) a molecule providing chemical energy for many anabolic reactions in living organisms	3) B, C are valid	
C) a coenzyme in many biochemical reactions	4) C, D are valid	
D) a nucleotide containing 2 high-energy phosphate bonds	5) A, B, C are valid	
E) a nucleoside formed by a ribose and adenine base	6) A, B, D are valid	
20. In RNA molecule forming a double stranded structure	1) A, D are valid	
A) Adenine bonds with Guanine	2) B, E are valid	
B) Adenine bonds with Thymine	3) C, E are valid	
C) Adenine bonds with Uracil	4) C, D are valid	
D) Cytosine bond with Thymine	5) B, C, E are valid	
E) Cytosine bonds with Guanine	6) only C is valid	

TEST A Ę BIOLOGY		
Question:	Answer:	<input checked="" type="checkbox"/>
1. Cell membrane:	1) A, B are valid	
A) is made of cellulose	2) C, D are valid	
B) consist of lipid bilayer and proteins	3) C, E are valid	
C) consist of glycolipids and protein bilayer	4) D, E are valid	
D) is permeable to water	5) C, D, E are valid	
E) may contain pores	6) only C is valid	
2. Oocyte development includes:	1) A, B are valid	
A) degeneration of follicle	2) A, B, C, D are valid	
B) arrest in meiotic prophase I	3) B, D are valid	
C) stage of primordial follicle	4) C, D are valid	
D) arrest in meiotic metaphase II	5) B, C, D, E are valid	
E) stage of secondary follicle	6) all answers are valid	
3. Erythrocytes with nuclei are present in:	1) only A is valid	
A) reptiles	2) B, D are valid	
B) fish	3) C, D are valid	
C) bird	4) only D is valid	
D) mammals	5) A, D are valid	
E) amphibian	6) all answers are valid except D	
4. Oocyte development includes:	1) A, B, E are valid	
A) degeneration of follicle	2) A, B, C, D are valid	
B) arrest in meiotic prophase I	3) C, D are valid	
C) stage of primordial follicle	4) A, B, D are valid	
D) arrest in meiotic metaphase II	5) B, C, D, E are valid	
E) stage of secondary follicle	6) all answers are valid	
5. Among leukocytes we can distinguish:	1) B, D, E are valid	
A) NK cells	2) A, B, C are valid	
B) monocytes	3) B, C, D, E are valid	
C) neutrophils	4) A, D, E are valid	
D) eosinophils	5) D, E are valid	
E) lymphocytes	6) all answers are valid	

6. The best definition of ruminants from the following is:	1) only A is valid	
A) animals with horns	2) only B is valid	
B) animals with hornets	3) A, C are valid	
C) animals having two main hooves on each foot	4) only D is valid	
D) animals having prestomachs (rumen, reticulum, omasum)	5) B, E are valid	
E) animals eating feed of plant origin	6) no answer is valid	
7. Which of the statements are true:	1) A, B, E are valid	
A) blood is a suspension of various types of cells	2) A, B, C, D are valid	
B) basophiles are the cellular elements of blood containing histamine	3) A, B, C, E are valid	
C) neutrophils provide a major defense against infection by bacteria	4) A, B, D, E are valid	
D) platelets provide a major defense against the viral infection	5) A, C, D, E are valid	
E) maturation of blood cells requires the presence of cyanocobalamin (B ₁₂)	6) all answers are valid	
8. Haemoglobin is:	1) only C is valid	
A) a hormone	2) C, E are valid	
B) an enzyme	3) A, B, D are valid	
C) a metalloprotein	4) B, C, E are valid	
D) present in all leukocytes	5) A, B, D, E are valid	
E) present in red blood cells	6) all answers are valid	
9. The most common polysaccharide storage material is:	1) A, B are valid	
A) glucose in animals and fructose in plants	2) B, C are valid	
B) glycogen in animals and plants	3) C, D are valid	
C) starch in plants	4) D, E are valid	
D) glycogen in animals	5) A, B, C are valid	
E) glucose in all living organisms	6) no answer is valid	
10. DNA sentence GCAT is complementary with mRNA:	1) only A is valid	
A) UCAT	2) only B is valid	
B) CGTA	3) only C is valid	
C) CUTA	4) only D is valid	
D) CGUA	5) only E is valid	
E) CGAU	6) no answer is valid	

11. In a hypotonic solution red blood cells (RBC):	1) A, C are valid	
A) collapse due to the movement of water towards the higher concentration of salt in the environment (plasma)	2) B, D are valid	
B) swell due to the movement of water towards the higher concentration of salt in the cell	3) only A is valid	
C) collapse in a process defined as osmosis	4) only B is valid	
D) swell in a process defined as osmosis	5) only E is valid	
E) change the pH of its cytoplasm	6) B, D, E are valid	
12. Among cells belonging to connective tissue there are:	1) A, B, C are valid	
A) fibrocytes	2) B, C, D are valid	
B) adipocytes	3) B, D, E are valid	
C) red blood cells	4) A, B, C, E are valid	
D) glial cells	5) A, B, D, E are valid	
E) hepatocytes	6) only B is valid	
13. Plasmid:	1) only E is valid	
A) can be present in both eukaryotic and prokaryotic cells	2) only C is valid	
B) is a circular molecule of DNA	3) A, B, C, D are valid	
C) is situated in cytoplasm	4) A, C, D, E are valid	
D) may cause bacterial resistance against antibiotics	5) B, C, D are valid	
E) is a molecule of RNA	6) A, D, E are valid	
14. DNA is present in eukaryotic cell in:	1) A, E is valid	
A) nucleolus	2) A, B, D, E are valid	
B) chloroplasts	3) A, B, E are valid	
C) Golgi apparatus	4) D, E are valid	
D) mitochondria	5) A, D are valid	
E) ribosomes	6) A, B, D are valid	
15. The anterior lobe of the pituitary gland (hypophysis):	1) only A is valid	
A) produces growth hormone	2) B, C are valid	
B) produces insulin	3) B, C, E are valid	
C) produces glucagon	4) A, D are valid	
D) produces oxytocin	5) A, E are valid	
E) is mainly regulated by hormones produced in the hypothalamus	6) all answers are valid	

16. DNA is present in eukaryotic cell in:	1) A, E is valid	
A) nucleolus	2) A, B, D are valid	
B) chloroplasts	3) A, B, E are valid	
C) Golgi apparatus	4) B, C, D are valid	
D) mitochondria	5) B, C, E are valid	
E) ribosomes	6) C, D, E are valid	
17. Which part of neuron transmit the nerve impulse:	1) A, C, D are valid	
A) axon	2) B, C, D are valid	
B) neurosis	3) A, B, D are valid	
C) dendrite	4) A, B, C, D are valid	
D) perikaryon (soma)	5) A, C are valid	
E) nucleus	6) all answer are valid	
18. Both mitochondrial oxidative phoshorylation and photosynthesis include:	1) only A is valid	
A) consumption of oxygen	2) A, B are valid	
B) formation of proton gradient	3) A, C are valid	
C) transfer of electrons	4) B, C are valid	
D) formation of carbohydrates	5) A, B, D are valid	
E) protein formation	6) all answer are valid	
19. The sensory components of breathing are:	1) A, B, E are valid	
A) central chemoreceptors	2) A, B, C are valid	
B) peripheral chemoreceptors	3) C, D are valid	
C) diaphragm	4) A, B, D are valid	
D) intercostal muscles	5) C, D, E are valid	
E) lung proprioreceptors	6) all answers are valid	
20. The left atrium of the heart:	1) A, B, C, D are valid	
A) receives oxygenated blood	2) A, B, C are valid	
B) receives blood from left and right pulmonary veins	3) A, C, E are valid	
C) pumps blood to the left ventricle	4) A, D, E are valid	
D) its contraction is immediately followed by left ventricular systole	5) A, C, D are valid	
E) pumps blood through mitral (bicuspid) valve	6) all answers are valid	