


<b>Egypt-Japan University of Science and Technology</b>		
<b>Subject: Chemistry</b>	<b>Academic Year: 2020/2021</b>	 E-JUST Egypt-Japan University of Science and Technology مصر-اليابان جامعة العلوم والتكنولوجيا エジプト日本科学技術大学
<b>Exam Duration: 1 hour</b>	<b>No. of Pages: 4</b>	

## **E-JUST Entrance Exam 2021**

**Subject: Chemistry**

**Time: 1 hour**

**Student Name:**.....

**Application ID No:**.....

### **Undergraduate Entrance Examination Instructions**

1. Examinees will be provided with question booklet and answer sheet.
2. Questions are on both the front and back of the page.
3. Question booklet contains scratch papers for use in solving exams.
4. Answer ALL questions to the best of your abilities. Be sure to write legibly and choose your answers clearly using HB or B pencil, not pen.
5. Question booklet will be collected back.

**Choose the correct answer:**

**Q1. An aqueous solution is prepared by dissolving 80 g NaOH in 2.0 Liter of water. What is the molar concentration of the solution? (Na = 23, O = 16, H = 1)**

- A. 1 mol/L
- B. 2 mol/L
- C. 5 mol/L
- D. 4 mol/L

**Q2. The boiling point of pure water is .....**

- A. 0 K
- B. 273 K
- C. 373 K
- D. 100 K

**Q3. What is the general formula of alkanes?**

- A.  $C_nH_{2n+2}$
- B.  $C_nH_{2n}$
- C.  $C_nH_{2n-2}$
- D.  $C_nH_n$

**Q4. The nucleus of an atom consists of .....**

- A. electrons and neutrons
- B. electrons and protons
- C. protons and neutrons
- D. electrons, neutrons, and protons

**Q5. Which state of matter has the highest kinetic energy?**

- A. Solid state
- B. Liquid state
- C. Gases state
- D. None of the above.

**Q6. The oxidation state of the element (P) in  $Na_3PO_4$  is .....**

- A. 1
- B. 3
- C. 5
- D. 7

**Q7. All the following are strong acids except.....**

- A.  $H_2SO_4$
- B.  $CH_3COOH$
- C. HCl
- D.  $HNO_3$

**Q8. Why do fish die in hot water?**

- A. Because of increasing the solubility of oxygen in hot water.
- B. Because of decreasing the solubility of oxygen in hot water.
- C. Because of increasing the solubility of sodium chloride in hot water.
- D. Because of increasing the solubility of carbon dioxide in hot water.

**Q9. Which is the most acidic solution?**

- A. pH = 11
- B. pOH = 2
- C. pOH = 12
- D. pH = 7

**Q10. Gases have ..... shapes and volumes, while the solids have ..... shapes and volumes.**

- A. fixed - fixed
- B. fixed - flexible
- C. flexible - fixed
- D. flexible - flexible

**Q11. All of the following compounds are unsaturated except .....**

- A. benzene
- B. propane
- C. propene
- D. propyne

**Q12. Which of the following molecules contain double bonds?**

- A. N<sub>2</sub>F<sub>2</sub>
- B. N<sub>2</sub>F<sub>4</sub>
- C. CH<sub>3</sub>CH<sub>2</sub>OH
- D. C<sub>2</sub>H<sub>6</sub>

**Q13. What is the order of increasing energy of the orbitals within a single energy level?**

- A. d < s < f < p
- B. s < p < d < f
- C. p < s < f < d
- D. f < d < p < s

**Q14. What is the molecular formula of sodium sulphate?**

- A. Na<sub>2</sub>SO<sub>4</sub>
- B. NaSO<sub>4</sub>
- C. Na<sub>2</sub>CO<sub>3</sub>
- D. NaHCO<sub>3</sub>

**Q15. Which of the following compound has the shortest triple carbon-carbon bond?**

- A. C<sub>2</sub>H<sub>5</sub>OH
- B. C<sub>2</sub>H<sub>6</sub>
- C. C<sub>2</sub>H<sub>4</sub>
- D. C<sub>2</sub>H<sub>2</sub>

**Q16. The chemical formula of ethanol is .....**

- A. CH<sub>3</sub>OH
- B. C<sub>2</sub>H<sub>5</sub>OH
- C. C<sub>3</sub>H<sub>7</sub>OH
- D. C<sub>4</sub>H<sub>9</sub>OH

**Q17. All of the following molecules are polar except .....**

- A. C<sub>6</sub>H<sub>6</sub>
- B. H<sub>2</sub>S
- C. CH<sub>3</sub>OH
- D. H<sub>2</sub>O

**Q18. What is IUPAC name for the compound CH<sub>3</sub>-CH=CH-CH<sub>2</sub>-CH<sub>2</sub>?**

- A. 3-Pentene
- B. 2-Pentene
- C. 1-Pentene
- D. 2-Pentane

**Q19. In a galvanic cell, .....**

- A. chemical energy is converted into electricity
- B. chemical energy is converted into heat
- C. electricity energy is converted into chemical energy
- D. electrical energy is converted into heat

**Q20. A neutral atom of an element has 2 electrons in the first energy level, 8 in the second energy level and 8 in the third energy level. This information does not necessarily tell us .....**

- A. the atomic number of the element.
- B. the total number of electrons in the first energy level.
- C. the total number of electrons in the second energy level.
- D. the number of neutrons in the nucleus of an atom of the element.

**PERIODIC TABLE OF THE ELEMENTS**  
*http://www.periodni.com*

GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1.0079 <b>H</b> HYDROGEN																	4.0026 <b>He</b> HELIUM
2	6.941 <b>Li</b> LITHIUM	9.0122 <b>Be</b> BERYLLIUM											10.811 <b>B</b> BORON	12.011 <b>C</b> CARBON	14.007 <b>N</b> NITROGEN	15.999 <b>O</b> OXYGEN	18.998 <b>F</b> FLUORINE	20.180 <b>Ne</b> NEON
3	22.990 <b>Na</b> SODIUM	24.305 <b>Mg</b> MAGNESIUM											26.982 <b>Al</b> ALUMINIUM	28.086 <b>Si</b> SILICON	30.974 <b>P</b> PHOSPHORUS	32.065 <b>S</b> SULPHUR	35.453 <b>Cl</b> CHLORINE	39.948 <b>Ar</b> ARGON
4	39.098 <b>K</b> POTASSIUM	40.078 <b>Ca</b> CALCIUM	44.956 <b>Sc</b> SCANDIUM	47.867 <b>Ti</b> TITANIUM	50.942 <b>V</b> VANADIUM	51.996 <b>Cr</b> CHROMIUM	54.938 <b>Mn</b> MANGANESE	55.845 <b>Fe</b> IRON	58.933 <b>Co</b> COBALT	58.693 <b>Ni</b> NICKEL	63.546 <b>Cu</b> COPPER	65.38 <b>Zn</b> ZINC	69.723 <b>Ga</b> GALLIUM	72.64 <b>Ge</b> GERMANIUM	74.922 <b>As</b> ARSENIC	78.96 <b>Se</b> SELENIUM	79.904 <b>Br</b> BROMINE	83.798 <b>Kr</b> KRYPTON
5	85.468 <b>Rb</b> RUBIDIUM	87.62 <b>Sr</b> STRONTIUM	88.906 <b>Y</b> YTRITIUM	91.224 <b>Zr</b> ZIRCONIUM	92.906 <b>Nb</b> NIOBIUM	95.96 <b>Mo</b> MOLYBDENUM	(98) <b>Tc</b> TECHNETIUM	101.07 <b>Ru</b> RUTHENIUM	102.91 <b>Rh</b> RHODIUM	106.42 <b>Pd</b> PALLADIUM	107.87 <b>Ag</b> SILVER	112.41 <b>Cd</b> CADMIUM	114.82 <b>In</b> INDIUM	118.71 <b>Sn</b> TIN	121.76 <b>Sb</b> ANTIMONY	127.60 <b>Te</b> TELLURIUM	126.90 <b>I</b> IODINE	131.29 <b>Xe</b> XENON
6	132.91 <b>Cs</b> CAESIUM	137.33 <b>Ba</b> BARIUM	138.91 <b>La-Lu</b> Lanthanide	178.49 <b>Hf</b> HAFNIUM	180.95 <b>Ta</b> TANTALUM	183.84 <b>W</b> TUNGSTEN	186.21 <b>Re</b> RHENIUM	188.23 <b>Os</b> OSMIUM	192.22 <b>Ir</b> IRIDIUM	195.08 <b>Pt</b> PLATINUM	196.97 <b>Au</b> GOLD	200.59 <b>Hg</b> MERCURY	204.38 <b>Tl</b> THALLIUM	207.2 <b>Pb</b> LEAD	208.98 <b>Bi</b> BISMUTH	(209) <b>Po</b> POLONIUM	(210) <b>At</b> ASTATINE	(222) <b>Rn</b> RADON
7	(223) <b>Fr</b> FRANCIUM	(226) <b>Ra</b> RADIUM	(287) <b>Ac-Lr</b> Actinide	(267) <b>Rf</b> RUTHERFORDIUM	(268) <b>Db</b> DUBNIUM	(271) <b>Sg</b> SEABORGIUM	(272) <b>Bh</b> BOHRIUM	(277) <b>Hs</b> HASSIUM	(276) <b>Mt</b> MEITNERIUM	(281) <b>Ds</b> DARMSTADTIUM	(280) <b>Rg</b> ROENTGENIUM	(285) <b>Cn</b> COPERNICIUM	(287) <b>Uut</b> UNUNTRIUM	(287) <b>Fl</b> FLEROVIUM	(285) <b>Uup</b> UNUNPENTIUM	(291) <b>Lv</b> LIVERMORIUM	(289) <b>Uus</b> UNUNSEPTIUM	(289) <b>Uuo</b> UNUNOCTIUM

LANTHANIDE														
57 138.91 <b>La</b> LANTHANUM	58 140.12 <b>Ce</b> CERIUM	59 140.91 <b>Pr</b> PRASEODYMIUM	60 144.24 <b>Nd</b> NEODYMIUM	61 (145) <b>Pm</b> PROMETHIUM	62 150.36 <b>Sm</b> SAMARIUM	63 151.96 <b>Eu</b> EUROPIUM	64 157.25 <b>Gd</b> GADOLINIUM	65 158.93 <b>Tb</b> TERBIUM	66 162.50 <b>Dy</b> DYSPROSIUM	67 164.93 <b>Ho</b> HOLMIUM	68 167.26 <b>Er</b> ERBIUM	69 168.93 <b>Tm</b> THULIUM	70 173.05 <b>Yb</b> YTTERIUM	71 174.97 <b>Lu</b> LUTETIUM

ACTINIDE														
89 (227) <b>Ac</b> ACTINIUM	90 232.04 <b>Th</b> THORIUM	91 231.04 <b>Pa</b> PROTACTINIUM	92 238.03 <b>U</b> URANIUM	93 (237) <b>Np</b> NEPTUNIUM	94 (244) <b>Pu</b> PLUTONIUM	95 (243) <b>Am</b> AMERICIUM	96 (247) <b>Cm</b> CURIUM	97 (247) <b>Bk</b> BERKELIUM	98 (251) <b>Cf</b> CALIFORNIUM	99 (252) <b>Es</b> EINSTEINIUM	100 (257) <b>Fm</b> FERMIUM	101 (258) <b>Md</b> MEDELEVIUM	102 (259) <b>No</b> NOBELIUM	103 (262) <b>Lr</b> LAWRENCIUM

(1) Pure Appl. Chem., 81, No. 11, 2131-2156 (2009)  
Relative atomic masses are expressed with five significant figures. For elements that have no stable nuclides, the value enclosed in brackets indicates the mass number of the longest-lived isotope of the element. However, three such elements (Tl, Fr and U) do have a characteristic terrestrial isotopic composition, and for these an atomic weight is tabulated.

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**Good Luck**