

## Ph.D. Competative examination ( Analytical Chemistry )

Answer the following questions according to the request quoted with each .

- Q1:** Atomic Absorption relies on the formation of ..... in the ground state, otherwise interferences will occur; which could be,  
a)..... interferences. Or b) ..... interferences, c) .....interferences.
- Q2:** Tick the correct phrase;  
a) GC work under high vacuum while mass spectrometry require high pressure  
b) GC work under high pressure while mass spectrometry work under vacuum.
- Q3 :** Three explanation is regarded as best to describe the mechanisim of Microwave and how it works, they are as follows; a)..... b)..... C)..... .
- Q4:** When an electron strike a solid material it releases different kinds of effects , numerate four of them; a)..... B)..... c)..... d)..... .
- Q5:** Soft X-Ray (white X-Ray) can be generated by .....of released X-Ray photon to a ..... target .
- Q6:** Numerate three factors that will affect precipitation from homogenous solution,  
a)..... b)..... c)..... .
- Q7: A)** solution has  $1 \times 10^{-7} \text{M-HCl}$ ; The PH of the solution will be (pick one of the following);  
a)  $< 7$  b)  $> 7$  c)  $= 7$  .  
**B)** Arrange the following in the order of increasing acidity;  
HBr , HCl , HI .
- Q8:** In chromatography the number of theoretical plates at 50%peak height is expressed as N which is Equal to .....
- Q9: A)** In gas chromatography the detectors that are used ; a)..... b)..... C)..... .  
**B)** CHN- analyser is used to determine the ..... formula .
- Q10:** Electrophoresis deals with ..... Compound.
- Q11:** Silver ion is usually determined indirectly by Volhard method by titration with ..... using ..... indicator.
- Q12:** Laser spectroscopy is based on FOUR steps and they are; a)..... b)..... c)..... d)..... .
- Q13:** There are many kinds of reference electrodes. Numerate three; a)..... b)..... c)..... .
- Q14: A)** Give with simple examples the meaning of Von Weimarn relation.  
**B)** Give two differences between Turbidimetry & Nephelometry .
- Q15:** Polarography relies on the use of ..... as an indicator electrode to measure ..... and the use of ..... Solution to eliminate the migration current.

Time:-30 minutes.

Competition Examination [For Ph.D candidate]

**Q1) Write down the chemical structure & the names of:-**

- a- The final product (s) of the complete oxidation of glucose in the presence of oxygen,
  - b- The product(s) of beta -oxidation of saturated fatty acid.
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**Q2) what is the main difference between the following terms:-**

- a- Nucleotide & Nucleoside.?
  - b- Catabolism & Anabolism.
  - c- Hormone & Enzyme.
  - d- Allosteric enzyme & enzyme that follow Michalis-Menton kinetics.
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**Q3) Choose the correct answer:-**

1) All the 20 a.a.s are optically active except:-

- a-lysine.      b-the aromatic a.a.s .      c-glycine.      d-serine.      e-cysteine.

2) A codon consists of:-

- a-one molecule of aminoacyl-tRNA.      b- Two complementary base pairs.
- c- three consecutive base pairs.      d-an individual ribosome      e- four individual nucleotides.

3)All the following contain glucose as a structural unit except:-

- a-maltose.      b-glycogen.      c-mannose.      d-lactose.      e-sucrose.

4) Hydrolysis of a mixture of phosphoglycerides may yield all the following except:-

- a-serine.      b-choline.      c-galactose.      d-glycerol.      e-phosphate.

5)The major source of extracellular cholesterol for human tissue is :-

- a-VLDL .      b-LDL.      c-HDL.      d- albumin .      e- gama globulin.

6) Which one of the following is characteristic of low insulin levels:-

- a- increase glycogen synthesis.      b- decrease gluconeogenesis from lactate;
- c-increase formation of hydroxybutyrate      d-decrease glycogenolysis.

7)A peptide bond:-

- a- is ionized at the physiological pH.      b- is cleaved by agents that denature proteins
- c- occur most commonly in the cis configuration.      c-has a partial double bond character.

8) The rate of DNA synthesis in a culture of cells could be most accurately determined by  
Measuring the incorporation of which of the following

- a- phosphate.      b-adenine.      c-gaunine.      d-thymidine.      e-uridine.