

CHEMISTRY

I GENERAL CHEMISTRY

Which of the following compounds has ionic bond?

- a) C_2H_6
- b) Cl_2
- c) NH_3
- d) $MgCl_2$

The correct answer is d): $MgCl_2$

In which of the following series all elements are nonmetals?

- a) H, Li, P, I, He
- b) Br, C, P, S, I
- c) I, Mn, Fe, As, O
- d) Si, Cu, I, Ne, Bi

The correct answer is b): Br, C, P, S, I

II INORGANIC CHEMISTRY

Anhydride of nitric acid is:

- a) N_2O_3
- b) NO_2
- c) N_2O_5
- d) N_2O

The correct answer is c): N_2O_5

Which of the following mixtures of solutions has buffer properties?

- a) $NH_3 + NH_4NO_3$
- b) $H_2SO_4 + NaHSO_4$
- c) $HCl + NaCl$
- d) $NH_3 + NaCl$

The correct answer is a): $NH_3 + NH_4NO_3$

III ORGANIC CHEMISTRY

The main product obtained in addition reaction of water to 2-methylpropene is:

- a) 2-methyl-1-propanol
- b) 1,2-propanediol
- c) 2-methyl-2-propanol
- d) 1,3-propanediol

The correct answer is c): 2-methyl-2-propanol

Common name of propanedioic acid is:

- a) succinic acid
- b) malic acid
- c) tartaric acid
- d) malonic acid

The correct answer is d): malonic acid

IV CHEMISTRY OF NATURAL PRODUCTS

Which of the following series contains ONLY amino acids with –OH group in their side chains?

- a) Tyr, His, Thr
- b) Thr, Ser, Tyr
- c) Ser, Thr, Met
- d) Phe, Tyr, Trp

The correct answer is b): Thr, Ser, Tyr

D-Glucose and L-Glucose are:

- a) C2-epimers
- b) enantiomers
- c) anomers
- d) tautomers

The correct answer is b): enantiomers

BIOLOGY

I CITOLOGY

Double-membraned organelle of eucaryotes is:

- a) nucleus
- b) endoplasmic reticulum
- c) Golgi complex
- d) lysosome

The correct answer is a): nucleus

Hydrolysis is the primary kind of chemical reaction in:

- a) rough endoplasmic reticulum
- b) Golgi complex
- c) lysosome
- d) nucleus

The correct answer is c): lysosome

II DEVELOPMENTAL BIOLOGY

During spermatogenesis, first meiotic division occurs at the level of:

- a) spermatogonia
- b) primary spermatocytes
- c) secondary spermatocytes
- d) spermatids

The correct answer is b): primary spermatocytes

Which process during development converts the blastocyst into the trilaminar structure?

- a) Placentation
- b) Gastrulation
- c) Neurulation
- d) Cleavage

The correct answer is b): Gastrulation

III MOLECULAR BIOLOGY

Percentage of guanine-cytosine pairs (G-C) in one DNA molecule is 58%. Calculate the percentage of thymine in this DNA molecule.

- a) 21%
- b) 42%
- c) 29%
- d) 12%

The correct answer is a): 21%

Human ribosomes, mouse mRNA and tRNA from tobacco are in one test tube. Which/whose proteins will be synthesized during *in vitro* translation?

- a) Human proteins
- b) Mouse proteins
- c) Tobacco proteins
- d) Both human and mouse proteins

The correct answer is b): Mouse proteins

IV INHERITANCE AND HUMAN GENETICS

Inheritance of ABO blood types system is:

- a) monogenic
- b) polygenic
- c) polymorphic
- d) pleiotropic

The correct answer is a): monogenic

What is the probability that son will be affected (ill) if his mother is a carrier of hemophilia and father has normal blood coagulation?

- a) 0%
- b) 25%
- c) 50%
- d) 75%

The correct answer is c): 50%