

SAMPLE QUESTIONS - MSc Biotechnology

- This is only a sample paper and only meant to be indicative of the type of questions that will be asked.

Section-A

1. Which one of the following column chromatography techniques can be used for the purification of a Poly-Arginine tagged protein?
 - a. Affinity chromatography
 - b. Cation-exchange chromatography
 - c. Anion-exchange chromatography
 - d. Size-exclusion chromatography
2. How many ATPs are synthesized during the complete oxidation of a single acetyl-CoA?
 - a. 2
 - b. 10
 - c. 20
 - d. 30
3. Which one of the following groups of amino acids is synthesized from pyruvate?
 - a. Valine, Leucine and Isoleucine

- b. Glutamine, Proline and Arginine
 - b. Methionine, Threonine and Lysine
 - d. Tryptophan, Phenylalanine and Tyrosine
4. How much energy is produced by the complete oxidation of one gram of fatty acid?
- a. ~0.38 KJ
 - b. ~3.8 KJ
 - c. ~38 KJ
 - d. ~380 KJ
5. Which one of the following glucose transporters has the highest K_m value?
- a. GLUT1 of all mammalian tissues
 - b. GLUT2 of Liver
 - c. GLUT3 of all mammalian tissues
 - d. GLUT4 of muscle and fat cells
6. Glucose-6-phosphate (6C) is converted to ribose-5-phosphate (5C) by Pentose phosphate pathway. Which carbon from glucose-6-phosphate is removed in the form of CO_2 in this process?
- a. C6
 - b. C1
 - c. Either C1 or C6
 - d. Any carbon can be removed
7. Which one of the following inheritable metabolic defects in humans was discovered first?
- a. Diabetes
 - b. Phenylketonuria
 - c. Obesity
 - d. Lesch Nyhan syndrome

8. Which one of the following citric acid cycle intermediates is a precursor of porphyrins?
- a. Oxaloacetate
 - b. Malate
 - c. Succinyl CoA
 - d. α -ketoglutarate
9. Which one of the following leukocytes are present in blood in highest numbers?
- a. B cells
 - b. NK Cells
 - c. Eosiniphils
 - d. Neutrophils
10. How many protein chains are there in a fully assembled IgM antibody molecule?
- a. 5
 - b. 20
 - c. 21
 - d. 25

Section-B

11. Which one of the following statements about the antibody molecule is not true?
- a. Immunoglobulin unit has two heavy and two light chains
 - b. Heavy and light chains are bound by the disulfide bond
 - c. Each immunoglobulin unit has two different antigen binding sites
 - d. Constant domains do not participate in antigen binding
12. Virus infected cells are generally eliminated by which kind of immune cells?

- a. A class of T cells
 - b. A class of B cells
 - c. Macrophages
 - d. Neutrophils
13. Which one of the following properties is not associated with natural killer cells?
- a. Killing of tumor cells
 - b. Phagocytosis of virus
 - c. Killing of virus infected cells
 - d. Activation by interferon
14. Graft rejection reaction is mediated by
- a. T cells
 - b. Macrophages
 - c. B cells
 - d. Mast cells
15. Which one of the followings is not required for anti-pollen allergies?
- a. IgE
 - b. IgA
 - c. Mast cells
 - d. Basophils
16. Which one of the following is a central tendency?
- a. Standard deviation
 - b. Median
 - c. Range
 - d. Median deviation

17. Interquartile range is

- a. Q1
- b. Q3
- c. $Q3-Q1$
- d. $(Q3-Q1)/2$

18. A paired t-test is done to identify the difference between

- a. two groups
- b. three groups
- c. one group, before and after a treatment
- d. three groups, before and after a treatment