	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR FOURTH GRADE STUDENT (BC)			
	COURSE TITLE:	GENETIC ENGENEERING		COURSE CODE: BC4103
DATE:	31-12-2022	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

I) Choose the correct answer (20 marks)

1. Usually, in *E. coli* methylate ..... residue to protect their DNA from digestion
   a. Adenine b. Cytosine c. Guanine d. Uracil
2. T4 DNA ligase requires ..... for ligation process
   a. NAD^+ b. $NADP^+$ c. ATP d. ATP or NAD^+
3. Direct uptake of exogenous DNA via cell membrane
   a. Transformation b. Microsome c. rDNA technology d. sanger sequencing
4. It has two origins of replication
   a. Shuttle vector b. Cosmid c. expression vector d. cloning vector
5. Maxim-Gilbert sequencing method is called .....
   a. Chemical method b. Termination method c. Both d. None of these
6. .....creates new codon for the same amino acid as the native one
   a. Silent mutation b. Nonsense mutation c. Frameshift d. Missense mutation
7. Eukaryotic mRNA is easily to purify from others RNA due to.....
   a. Contains Poly A tail b. its fragile nature c. high stability d. All of these
8. The role of (dideoxyribonucleotides)(ddNTP) in sanger sequencing is .....
   a. Enhances the reaction b. stop the reaction c. regulate the reaction d. Non
9. Recovery media contain yeast extract as ..... for transformed cell
   a. Carbon source b. energy source c. nitrogen source d. electrolyte source
10. ..... is restriction enzyme recognizing a palindromic DNA sequences 4 to 8 base pairs in length and generally cleave within that sequence.
    a. Type IIP b. Type I c. EcoKI d. Type III

II) Write the scientific term for the following items (10 marks)

1. A technique used to move specific gene from parent vector to another destination vector
2. Vectors can replicate in two different hosts
3. Vector used to introduce a gene into host cell to produce the relevant gene product
4. Introduction of the gene inside cells with the viral aiding
5. Short segment of DNA contains several restriction sites allowing for insertion of DNA.
6. Extrachromosomal DNA can integrate with chromosomal DNA
7. A mutation occurs when a stop codon is added instead of an amino acid coding codon
8. The physical or chemical agent that induce the mutation
9. Mutation of single base insertion leading to alter in the reading pattern
10. An engineered construct in which two or more components are linked to form a novel biological agent

باقى الاسئله فى الخلف

III) Put (✓) or (x) for the following sentences (10 marks)

1. λ genome is nonessential and could be replaced with foreign DNA ( )
2. The expression vectors could be plasmid, cosmid and phags ( )
3. Bacteriophage λ genome contains 48,514 bp of linear ssDNA ( )
4. Episome can exist in prokaryotes and eukaryotes ( )
5. PUC plasmid has Cohesive site ( )
6. Type III restriction have two subunit M and R ( )
7. pBR322 selection based on LacZ system ( )
8. hyperchromicity used to track the condition of DNA as temperature changes ( )
9. Cosmid is plasmid cloning vector that can replicate in two different organisms ( )
10. Reciprocal translocation take place between two homologous chromosomes ( )

IV) Answer the following items (60 marks)

1. List the features of the good vector
2. Compare between sanger and Maxam-Gilbert sequences methods
3. Compare between type IIP and IIS restriction enzymes
4. Give a short account on Cystic fibrosis and Sickle cell anemia.
5. Briefly explain the SYBR green and TaqMan qPCR
6. Explain the main steps to produce a purified protein using recombinant DNA technology

Best Wishes	
Examiners	Professor/ Tarek Mostafa Dr/ Hamed Adel

	Tanta UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION for Seniors (Fourth Year) students OF Biochemistry			
	COURSE TITLE:	Immunology		COURSE CODE: BC 4107
DATE: 28-12	JANUARY, 2023	TERM: FIRST	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

I-Choose the correct answer (30 Marks)

1- **Agglutinins are useful in detection of infection caused by Mycoplasma pneuinoniae. They are mainly IgM molecules. Assuming that successful treatment of infection caused abrupt cessation of synthesis of agglutinins, how long would it take for a fourfold drop in the concentration of IgM molecules in serum to take place?**

a) approximately 2 days b) approximately 10 days
c) approximately 2 months d) approximately 2 years

2- **A patient is admitted with multiple bacterial infections and is found to have a complete absence of C3. Which complement-mediated function would remain intact in such a patient:**

a) opsonization of bacteria b) generation of anaphylaioxins
c) generation of neuirophil chemotaclic factors d) none of the above

3- **The class-specific antigenic determinants (epitopes) of immunoglobulins are associated with**

a) L chains b) J chains c) disulfide bonds d) H chains

4- **Macrophages**

a) are derived from blood monocytes b) have a great diversity of form
c) are able to ingest and degrade microorganisms d) all the above

5- **The immune cells that are responsible for detecting and destroying parasites are:**

a) Natural killer cells b) Mast cells c) Eosinophils d) Neutrophils

6- **. Converting a toxin to a toxoid**

a) makes the toxin more immunogenic b) enhances binding with antitoxin
c) reduces the pharmacologic activity of the toxin d)increases phagocytosis

7- **In vitro the precipitation occur when proportion of antigen to antibody is in:**

a) The zone of antibody excess b) The equivalence zone
c) The zone of antigen excess d) The prozone

8- **Complement activation by an immune complex may result in**

a) precipitation b) release of anaphylatoxins
c) release of macrophage-inhibiting factor d) non of the above

9- **Zeta potential forced RBCs to .....**

a) difficulty in agglutinating b) Rapidly agglutinating
c) Prevent precipitation d) Rapidly precipitation

10- **The first immunoglobulin synthesized by the fetus is**

a) IgA b) IgE c) IgG d) IgM

11 - **In the complement fixation test, the hemolysin-sheep erythrocyte complex**

a) is the test system b) is used to detect any noncomplexed complement
c) fixes complement in a positive test d) is the indicator system

12- **Human T cells can be distinguished from B cells and other cells by**

a) morphologic appearance b) the presence of Fc receptors
c) the formation of rosettes with sheep red cells d) the presence of Ig surface markers

13-**The class specific antigenic determinants (epitopes) of immunoglobulins are associated with**

a) L chains b) H chains c) disulfide bonds d) variable regions

14- **Immature B lymphocytes**

a) produce only p-chains
b) are at a stage in development where contact with antigen may lead to unresponsiveness
c) are progenitors of T lymphocytes as well as B lymphocytes
d) express both IgM and IgD on their surface

15- Allergy to penicillin is an example of

a) Type I hypersensitivity b) Type II hypersensitivity
c) Type III hypersensitivity d) Type IV hypersensitivity

II- Put (√) in front of correct statement and (X) in front of incorrect ones: **(15 Marks)**

1- Innate Immunity is present from birth
2- Heterologous antigen denotes that antigen and immunogen are the same
3- Microorganisms secreat substance that that attract lymphatic cells
4- The binding between Ag and Ab by electrostatic bond only
5- Long lived immune cells are granulocyte
6- Penicillin called hapten because its molecular weight is lower than 1000 dalton
7- The ability to respond to previous unseen molecule is called discrimination between self and no self
8- Cellular mediated immunity is mediated by serum Ab
9- Many tissues synthesis substance that harm to microorganisms and inhibitor growth only
10- The molecule of toxin and toxoid are similar in many physicochemical and biological respect
11- The elimination of microorganisms from respiratory tract is aid by olevor macrophage
12- Appearance of DNA antibody in patient with rubella
13- Active immunity referred to immunization through transfer of specific antibody from immunized individual to non-immunized individual
14- Cooperative T cell with B-cell enhance the production of Ab
15- Granulocyte referred to polymorphic leukocyte

III- Explain the following: **(20marks)**

a. Complement classical pathway
b. B-cell markers
c. Separation of free antigen from that bound to antibody in radio-immuno assay
d. Determination of molecular weight of specific antigen

IV- Illustrate with a diagram of the following **(20 marks)**

a. Ag processing by APC
b. Kinetic of immune response
c. The thymus structure
d. Immunoglobulin that secret in tears

V- Give account of each the following: **(15 marks)**

a. Manose receptor
b. Detection of unknown antigen by using Immunofluorescence
c. Detection of anti-Rh IgG antibodies in the blood of an Rh negative.

أطيب التمنيات بالنجاح و التوفيق

Prof. Tarek M Mohamed

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL FOUR BIOCHEMISTRY STUDENTS			
	COURSE TITLE:	NEUROCHEMISTRY		COURSE CODE: BC4111
DATE:	21-1-2023	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer all of the following questions: (الأسئلة في ورقتين أنظر خلف الورقة)

I. Choose the correct answer to each of the following: (20 Marks)

1. **…….. nervous system is associated with voluntary movement.**

A) Somatic B) Autonomic C) Sympathetic D) Parasympathetic

2. **Which acetylcholine receptors result in a faster transmission?**

A) Nicotinic receptors B) Muscarinic receptors C) Both of them D) none of them

3. **Motor neurons are …… neurons.**

A) unipolar B) bipolar C) pseudounipolar D) multipolar

4. **Excess …… leads to hypersomnia.**

A) acetylcholine B) glutamate C) GABA D) none of them

5. **…….. acts as the primary immune defense of the CNS.**

A) Oligodendrocytes B) Astrocytes C) Microglia D) Ependymal cells

6. …….. is a measure of the receptors' density per unit of tissue.

A) B_{min} B) B_{mix} C) B_{max} D) B_{mid}

7. **One of the following can be classified as biogenic amine neurotransmitter……**

A) Glutamate B) Acetylcholine C) No-adrenaline D) DOPA

8. **20% of tyramine is metabolized by……in ……..**

A) MAOA B) MAOB C) Liver D) Intestine E) CNS

9. **……is a type of serotonin receptor that causes inhibitory responses**

A) 5HT-3 B) 5HT-4 C) 5HT-5 D) 5HT-7 E) 5HT-6

10. **Tyrosine hydroxylase inhibitor that regulate catecholamine biosynthesis is……**

A) AMDT B) AMTP C) MAPT D) AMPT E) APMT

II. Complete the following sentences: (20 Marks)

1. …….. is involved in a fight or flight response.
2. The action of acetylcholine in the synapse is terminated by an enzyme called ……..

3. Alzheimer's disease and Parkinson's disease are both linked to changes in the neurotransmitter .....
4. The precursor of GABA is .....
5. The membrane potential is maintained through .....
6. Monoamine oxidase inhibitors includes..... and .....
7. Factors that decrease acetylcholine release and affecting anions channels....., ..., ..., and.....
8. The false neurotransmitters are packaged in the synapse leads to.....
9. Neuromodulators are.....
10. Auto-receptors are.....

III. Explain each of the following: (60 Marks)

1. Methods of neurotransmitters clearance.
2. Medical uses of Botulinum toxin.
3. Alcohol target glutamate and GABA receptors.
4. The importance of myelin sheath in myelinated neurons.
5. Glial cells are involved in glutamate synthesis.
6. Neuromuscular junction and Myasthenia gravis
7. Serotonin receptors and its pathways in the brain.
8. Biogenic amine hypothesis and MAO inhibitors.
9. Tabulate fast, moderate, and slow neurotransmitters, receptors, effectors.
10. Acetylcholine receptors and cellular effects.

Good luck

Examiners: Prof. Dr. Karim Samy El-Said

Dr. Marian Nabil Gerges

	TANTA UNIVERSITY *FACULTY OF SCIENCE* *DEPARTMENT OF CHEMISTRY*			
	Examination for 4th Year Biochemistry Students			
	COURSE TITLE:	**Biological Oxidation**		
DATE: 25 - 1- 2023	COURSE CODE: BC4117	TERM: FIRST TERM	MARKS: 50	TIME ALLOWED: 2 HOURS

I. Show by diagram: (20 Marks)

1. Some electrons from cytosolic NADH transported into the mitochondria to enter the electron transport pathway by two different shuttles, explain.
2. Cyclic and Z-scheme phosphorylation in green plants.
3. Nitric oxide synthetase and role of NO as a vasodilator in response to neurotransmitters.
4. Calvin cycle.
5. Enzymatic antioxidant defense mechanism.

II. Discuss the following questions: (20 Marks)

1. Biosynthesis of nitric oxide and its protective and cytotoxic effects.
2. ATP synthase complex and its molecular mechanism of action.
3. Oxidative stress causes damage to three main biological components, explain. And mention the disorders that could be associated with it.
4. Chemiosmosis and uncouplers.
5. Mechanism of oxidative phosphorylation and the order of the respiratory chain.

III. Complete the following sentences: (10 Marks)

1. Factors affecting oxidative phosphorylation are……..and……
2. The three levels of antioxidant defense mechanisms .....,……., and.....
3. Cyanobacteria carry out photosynthesis to produce their own energy using.....
4. Chlorophyll (a) has .....group, while chlorophyll (b) has .....group.
5. Non-enzymatic antioxidants may be……., ……..and……
6. Complex IV contain……,……..,……..…,……...and……
7. Detergent treatment of respiratory chain complexes could cause ……..……and……..…
8. Proton-motive force is……..
9. The movement of ions across the membrane depends on a combination of two factors……and……..
10. The main sources of free radicals……,……...,……...,and ……

Best Wishes
Prof. Dr. Karim Samy