	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS			
	COURSE TITLE:	Biophysics and cell membrane		CODE: BP4172
DATE:	6, Mars, 2021	TERM: second	TOTAL MARK: 100	PERIOD: 2 HOURS

First question: True or false

- 1-cholesterol it is essential component of animal cell plasma membranes ()
- 2-in the membrane mass the lipids are much larger than proteins ()
- 3-the integral membrane proteins are inserted into the lipid bilayer ()
- 4-the cholesterol is not present in bacteria ()
- 5-sphingolipids and cholesterol form discrete membrane domains known as lipid raft ()
- 6-fatty acids consist of long hydrocarbon chains terminally in a carboxyl group ()
- 7-The fundamental building blocks of all cell membrane are phospholipid ()
- 8-Phospholipid bilayers form a unstable barrier between two aqueous Compartments ()
- 9-The outer membrane of mitochondria contains about 75% of protein ()
- 10-The plasma membrane of E. Coli constitutes 40% of the total membrane lipid ()
- 11-The plasma membrane of animal cells contains glycolipids and cholesterol which is about 80% of the total membrane lipid molecules ()
- 12-fluidity of membrane is determined by temperature only ()
- 13-lipid bilayers behave as two dimensional fluids ()
- 14-macro molecules constitute 80% to 90% of the dry weight of cells ()
- 15-water is 60% of the cell mass() 16-simple sugars such as glucose are the major nutrients of cell ()
- 17-the cell mass is composed of variety of small organic molecules ()
- 18-the basic formula for carbohydrates is $[CH_2O]$ ()
- 19-polymerization is joining of hundreds and thousands of low molecular weight molecules ()
- 20-recognition processes of cell need polysaccharides only to act ()
- 21-cellulose is branched polysaccharides ()
- 22-oligosaccharides serve as a markers target proteins ()
- 23-the linkage of glucose residue by Beta (1-4) rather than alpha (1- 4) glycosidic bonds causes cellulose to form short chains ()
- 24-Glycogen and starch are composed entirely of glucose molecule in B-configuration ()
- 25-Amylose is a form of glycogen appeared as unbranched molecule ()
- 26-Cellulose is the principal structure component of plant cell wall ()
- 27-both glycogen and one form of starch (amylopectin) contain occasional $\alpha(1-6)$ linkages, in which carbon 1 of one glucose is joined to carbon 6 of a second ()
- 28-The long extended chains formed by the linkage between cellulose and glucose residue form fiber of great mechanical strength ()

- 29-Glycogen and starch have similar function and their function is to store glucose ()
- 30-lipids are the minor component of cell membrane ()
- 31-the formula $C_3H_6O_3$ can be cyclized to form rings ()
- 32-Proteins of integral membrane proteins are inserted into lipid bilayer ()
- 33-Integral proteins can be associated only by reagents that disrupt hydrophobic interactions ()
- 34-The detergent proteins complexes are soluble in aqueous solutions ()
- 35-Many integral proteins are transmembrane proteins, which span the lipid bilayer with proteins exposed on both sides of membrane ()
- 36-transmembrane proteins are apparent as particles on the external faces of the membrane ()
- 37-the membrane spanning portions of transmembrane proteins are usually β helices of 20 to 25 hydrophobic amino acids ()
- 38-the membrane spanning portions of transmembrane proteins are usually α helices of 20 to 30 hydrophobic amino acids ()
- 39-The transmembrane proteins are transported in membrane vesicles from endoplasmic vesicles from endoplasmic reticulum to the Golgi apparatus and from there to plasma membrane ()
- 40-The hydrophobic tails bind to the hydrophobic regions of integral membrane proteins forming detergent protein complexes ()
- 41-carrier proteins selectively bind and transport specific small molecules ()
- 42-passive transport means that molecules transported by either channel or carrier proteins cross membranes in favorable direction ()
- 43-carrier proteins act like hormones to facilitate the passage of specific molecules across the membrane ()
- 44-membrane proteins can thus use the free energy stored as ATP to control the internal composition of the cell ()
- 45-active transport means that molecules transported by either channel or carrier proteins cross membranes with a concentration gradient ()
- 46-Lipids of plasma membrane control the interaction between cells and serve as sensors. ()
- 47-red blood cells don't contain nuclei. ()
- 48-The surface area of the lipid monolayer turned out to be half that occupied by the erythrocyte plasma membrane. ()
- 49-the membrane consists of lipid monolayer rather than bilayer. ()
- 50-the plasma membrane appears under high magnification electron micrographs as 2dense lines separated by an intervening space. ()

Second question: Chose the correct answer:

1-Biological membranes consist of inserted into lipid bilayer

- a- Proteins b- amino acid c- Carbohydrates d- none of them

2-Integral membrane proteins are embedded in membrane via of 20 to 25 hydrophobic amino acids.

- a- α helical region b- β sheets region c-glucose d-none of them

3- are not inserted in the cell membrane but are attached via interactions with integral membrane proteins.

a-Secondary proteins b- peripheral proteins c-lipids d-none of them

4-most transmembrane proteins of eukaryotic plasma membrane have been modified by the addition of

a-lipids b-ATP c- carbohydrates d-a&b

5-proteins can be anchored in membrane by that are covalently attached to polypeptide chain.

a- lipids b-glucose c-plasma dnone of them

6- Lipids constitute approximately of the mass of most cell membranes.

a)60%. b)30%. c)50%. d)70%.

7- Plasma membranes are approximately lipids and protein.

a)50% , 50%. b)70% , 30%. c)80% , 20%. d)40% , 60%.

8- The plasma membrane of E.Coli consists predominantly of

a)phosphatidylcholine. b)phosphatidylserine. c)phosphatidylethanolamine. d)sphingomyelin.

9- Mammalian plasma membrane are containing

a)phosphatidylcholine. b)phosphatidylserine. c)phosphatidylethanolamine. d)all of them.

10- Fluidity of membranes is determined by

a)temperature. b)lipid composition. c)a&b. d)none of them.

11- If only a few sugars are joined together , the resulting polymer called

a- Oligosaccharides b-Polysaccharides c-Monosaccharides d-Disaccharides

12-both glycogen and one form of starch (amylopectin) contain occasional linkages

a-1-6 b-3-5 c-2-4 d-6-12

13-Cellulose is

a-Unbranched b-Branched c-Equivalent d-None of the above

14-The linkage between cellulose and glucose residue by Beta 1-4 cause the cellulose to form

a-Long chains b-Short chains c- Long extended chain d-Segments

15-Steroid hormones are considered

a-Lipids b-Proteins c-CHO d- Vitamins

16-Amylopectin and amylose are forms of.....

a-Glucose b-Starch c-Glycogen d-All of them

17-Unsaturated fatty acid contain one or more

a-Double bond b-Single bond c-Multi bond d-All of them

18-Glucose is Sugar

a-Pentose b-Hexose c-Triose d-Mono

19-Which one of the following formula can be cyclized to form rings

a. $C_3H_6O_3$ b. $C_5H_{10}O_5$ c. CO_2 d. H_2CO_3

20-Oligosaccharides and Polysaccharides are important to interaction between cells in tissue of

a. Multicellular organisms b. Unicellular organisms c. DNA d. RNA

21-..... are responsible for carrying out specific membrane functions

a- protein b-lipid c-phosphate group

22-channel proteins form small pores through which ions can cross the membrane by.....

a-active transport b- free diffusion c-osmotic pressure d-cell transport

- 23-carrier proteins selectively bind and transport small molecules such as
- a-water b- glucose c-hemoglobin d-ankyrin
- 24-..... act like enzymes to facilitate the passage of specific molecules
- a- carrier proteins b-channel proteins c-coupled proteins
- 25-..... Means that molecules transported by channel proteins across membranes in favorable direction
- a-active transport b- passive transport c-free diffusion d-osmotic pressure
- 26-..... Means transporting molecules across membranes in unfavorable direction
- a- active transport b-passive transport c-free diffusion d-osmotic pressure
- 27- The fundamental structure of the membrane is
- a. Protein b. Lipid c. The phospholipid bilayer d. A&b
- 28- Embedded within the phospholipid bilayer carry out the specific functions of the plasma membrane.
- a. Proteins b. Lipids c. Nucleic acids d. Simple sugars
- 29-Represent a form of pure plasma membrane.
- a. Mammalian RBCs b. Animal cell c. Plant cell d. None of the above
- 30- The surface area occupied by a monolayer of extracted lipid spread out at an
- a. Air-protein interface b. Air-lipid interface c. Air-water interface d. None of the above
- 31- The dark lines in the plasma membrane represent
- a. Polar head groups of phospholipids b. Hydrophobic fatty acid chains c. Proteins d. A&b
- 32- The lightly stained interior portion of the membrane contains
- a. Proteins b. Carbohydrates c. Hydrophobic fatty acid chains d. None of the above
- 33- The outer leaflet consists mainly of
- a. Sphingomyelin b. Phatidylethanolamine c. Phosphatidylserine d. B&C
- 34- Are predominant phospholipids.
- a. Phosphatidylcholine b. Phatidylethanolamine c. Phosphatidyleserine d. B&C
- 35- Phosphatidylcholine is found in the
- a. Outer leaflet b. Inner leaflet
- 36- Phosphatidyleserine is
- a. Inner leaflet phospholipid b. Predominant phospholipid
- 37-proteins constituting of the mass of the various membrane .
- a-25 to 75 % b-25 to 50 % c-30 to 50 % d- 40 to 80 %
- 38- Plays a distinct role in determining membrane fluidity
- a-protein b-lipid bilayer c- fatty acid d- cholesterol
- 39-some proteins are unchained in the membrane by that are covalently attached to the polypeptide chain .
- a- lipid b- protein c- simple sugar d- none of them
- 40- with their protein exposed to the aqueous environment on both sides of the membrane
- a- hydrophilic b- hydrophobic c- a and b d- none of them
- 41- most transmembrane proteins of eukaryotic plasma membrane have been modified by the addition of
- a- protein b- carbohydrate c- lipid d- none of them

42- the proteins can be anchored to the face of the plasmamembrane

a- extracellular b- intracellular c- both of them d- none of them

43- biological membranes consist of inserted into a lipid bilayer

a- protein b- lipid c- carbohydrate d- none of them

44- proteins can be anchored to cytosolic of the membrane by addition of To the side chains of cysteine

a- palmitic acid b-14 carbonfatty acid c- 25 carbon fatty acid d- all of them

45-many such molecules cross cell membrane by action of specific transmembrane protein such as

a-H⁺ b-H₂O c- O₂ d- glucose

46- the general classes of membrane transport proteins

a- channel proteins b- channel and carrier proteins c- permeability d- a and b

47- channel proteins form Through which ions can cross the membrane by free diffusion .

a- large pores b- moderate pores c- small pores d- all of Proteins

48)Experiments of Christian Anfinsen in which the disrupted the three- dimensional structure of protein by treatment such as heating that break non- covalent bond this process called -----?

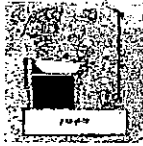
a) denaturation B) conformation C)a,b

49-)----- is directed of crystals of the protein to analyzed and the pattern of X- ray the pass through the protein crystal is detected an X- ray film?

a)Beam of X- ray B) beam of Gama – ray c) non above

50)----- structure of protein it is the sequence of amino acids in it polypeptide chain ?

a) primary b) secondary C) tertiary

	FACULTY OF SCIENCE DEPARTMENT OF PHYSICS		
	EXAMINATION FOR SENIORS ((FOURTH YEAR) STUDENTS OF <u>BIOPHYSICS</u>		
TANTA UNIVERSITY	COURSE TITLE:	ENVIRONMENTAL BIOPHYSICS I	
		COURSE CODE: BP4178	
DATE:	18\01\2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100
			TIME ALLOWED: 2 H

ANSWER THE FOLLOWING QUESTIONS

Q1) (25 Marks)

- A) What is meant by sustainability? Write briefly about the natural capital as a critical component of sustainability. *(10 Marks)*
- B) What are the possible causes of environmental problems? *(10 Marks)*
- C) Mention some possible ways that can be followed to reduce outdoor air pollution. *(5 Marks)*

Q2) (25 Marks)

- A) India's Ganges River is an example of highly polluted rivers. Explain how poverty, religious believes, and high population growth have contributed to the pollution of this river. *(10 Marks)*
- B) What are the effects of water thermal pollution? *(10 Marks)*
- C) What is Eutrophication? How does it affect water quality? *(5 Marks)*

Q3) (25 Marks)

- A) Define the radioactive pollution? What are the possible sources of radioactive contamination? *(10 Marks)*
- B) Write briefly about the role of oceans in controlling climate change. *(10 Marks)*
- C) What are the effects of global warming? *(5 Marks)*

Q4) (25 Marks, 2.5 Marks each)

- 1) Which has a higher albedo, an asphalt parking lot or a snow-covered field?
 - A) Asphalt parking lot
 - B) Snow-covered field
 - C) They have the same albedo
 - D) None of the above

- 2) The order of the atmospheric layers, starting from closest to the surface to the top of the atmosphere, is
 - A) Mesosphere, Troposphere, Thermosphere, Stratosphere
 - B) Troposphere, Stratosphere, Mesosphere, Thermosphere
 - C) Thermosphere, Mesosphere, Troposphere, Stratosphere
 - D) Troposphere, Stratosphere, Thermosphere, Mesosphere



انظر باقى الاسئلة خلف الصفحة



- 3) On average, how do high altitude thin and discontinuous cirrus clouds affect the surface temperature (compared to a clear sky)?
- A) High clouds warm the surface by increasing the greenhouse effect
 - B) High clouds cool the surface by increasing the energy emitted to space
 - C) High clouds cool the surface by increasing the albedo
 - D) It depends on whether they are comprised of ice or liquid water
- 4) At constant pressure, hot airthan cold air
- A) Is more dense
 - B) Is less dense
 - C) Has more vapor
 - D) has less vapor
- 5) In the stratosphere, why does temperature increase with increasing height?
- A) Conduction.
 - B) Convection.
 - C) Greater absorption of ultraviolet radiation at the top of the stratosphere.
 - D) The pressure and density rapidly decrease as you go up through the stratosphere.
- 6) Which one of the following layers of the atmosphere is responsible for the deflection of radio waves?
- A) Troposphere
 - B) Stratosphere
 - C) Mesosphere
 - D) Ionosphere
- 7) Which of the following statements is true?
- A) Troposphere is equally thick across different parts of the world
 - B) Troposphere contains the ozone layer
 - C) Troposphere is thinner at the equator than at the poles
 - D) Troposphere is thicker at the equator than at the pole
- 8) The temperature decreases with altitude in the stratosphere layer.
- A) True
 - B) False
- 9) what are the causes behind increasing the density of CO₂
- A) Burning of fossil fuels
 - B) Killing animals
 - C) Exploitation of minerals
 - D) Ozone layer depletion
- 10) The atmospheric layer important for human beings is
- A) Stratosphere
 - B) Troposphere
 - C) Thermosphere
 - D) Mesosphere

EXAMINER	ASSOC. PROF. MOHAMED SHAHEEN
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أطيب التمنيات بالتوفيق و النجاح



TANTA UNIVERSITY- Faculty of Science -Department of physics

Resit EXAMINATION FOR SENIORS STUDENTS OF BIOPHYSICS (4TH LEVEL)

COURSE TITLE:

Radiation Treatment Planning
تخطيط العلاج الاشعاعي

COURSE CODE:BP4171

DATE:

13/3/2021

TERM: FIRST

TOTAL ASSESSMENT MARKS:100

TIME ALLOWED: 2 HOURS

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ANSWER THE FOLLOWING QUESTIONS:

1- Discuss:

(25 Deg.)

(a) The methods to implement a code for the irradiation system.

(b) Calculate a treatment DOSE.

2- Explain the Physical basis of: -

(25 Deg.)

(a) Dual model [for electron, and Hard x-ray] irradiation systems, and

(b) The benefits for treating cancer, using them.

3- Show how you can make a qualified treatment plan, for :-

(25 Deg.)

(a) Surface tumors, and

(b) Deep seated tumors.

4- Write a short note for :-

(25 Deg.)

(a) The component of irradiation room.

(b) Correction for oblique incident and wedge filters.

استاذ لاده
د. د. هلال زينة
ميدان

والله ولي التوفيق

EXAMINERS

PROF. DR. KH. OMAR

PROF. DR. G. Z. FARAG



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

EXAMINATION FOR JUNIORS (FORTH YEAR) STUDENTS OF BIOPHYSICS

1969	COURSE TITLE:	BIOMATERIALS		COURSE CODE: BP417
DATE:	3 MARCH 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions

First question (25 marks)

A- Complete (10 marks)

- 1- The main types of natural polymers are , and..... .
- 2- Choose: Ductile material is exposed to plastic deformation (less – more) than brittle materials.
- 3- Choose: Calcium phosphate degradation (decreases – increases) with decreasing Calcium to phosphorous ratio.
- 4- A form of failure that occurs in materials when subjected to dynamic stress is called
- 5- The function of Cr ions in stainless steel alloys is

B- What is "wear" and which have higher wear resistance: stainless steel or Cobalt alloys? (5 marks)

C- What is the importance of biodegradation of polymers? (10 marks)

Second question (25 marks)

A- The movement of nearly inert bio-ceramics causes deterioration. Explain. (10 marks)

B- What are the applications of: collagen and poly-methyl methacrylate? (10 marks)

C- What are the disadvantages of the process of alloy casting? (5 marks)

Third question (25 marks)

A- What are the factors affecting the polymer degradation process? (10 marks)

B- Give some applications of stainless steel alloys and their disadvantages. (10 marks)

C- How carbides ($Cr_{23}C_6$) are formed and what is their bad effect? (5 marks)

Forth question (25 marks)


A- What are the disadvantages of natural polymers? (10 marks)

B- Explain the pitting corrosion of metallic biomaterials. (10 marks)

C- A tensile stress 10^5 N/m^2 applied to a copper rod of length 75 cm and its length changes to 75.03 cm by the action of stress. Find Young modulus of the copper. (5 marks)

Examiners Dr. Enas Hassan El-Ghazzawy

انتهت الأستاذة

	جامعة طنطا كلية العلوم قسم الفيزياء	
	امتحان لطلبة كلية العلوم الشعبة : فيزياء حيوى	
	الفرقة الرابعة	كود المقرر Bp4180
	Date: Feb. 2021	الزمن : ساعتان

Answer the following questions:

First question (12.5 deg.)

a- Write down about the future of radiation applications in all fields of life.

b- Define the following:

Free radicals, plating efficiency; cell surviving curve, and oxygen enhancement ratio (OER)

Second question (12.5 deg.)

a- There is an effect of oxygen presence on the radiated cells, discuss.

b- Write down about linear energy transfer and relative biological effectiveness

Third question (12.5 deg.)

a- Write down about the interaction of radiation with matter

b- True or false:

- 1- Extrapolation number n , measures the shoulder of surviving curve.
- 2- Rontgen is the unit of exposure and is related to the ability of x-rays to ionize air.
- 3- Oxygen has a positive and negative effect on radiated cells.

Fourth question (12.5 deg.)

a- Discuss in details cell surviving curve.

b- How can you classify the radiation depending on different aspects?

WITH MY BEST WISHES