MANSOURA UNIVERSITY
FACULTY OF PHARMACY
GENERAL MICROBIOLOGY AND IMMUNOLOGY EXAM (BME392)
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

4TH JANUARY, 2016
TIME ALLOWED: 2 HOURS

تعليمات

1. الامتحان يتكون من 9 صفحات أسئلة مختلفة وصفحة تعليمات وصفحة مسودة.
2. أسئلة الامتحان مقسمة على 4 اجزاء: Question 1, 2, 3 and 4.
3. يجب التأكد من عدد الصفحات وعدد الأسئلة قبل البدء فى الإجابة.
4. يجب الإجابة على كل سؤال فى مكان الاجابة المخصصة له.
5. يجب الإجابة باللون الأزرق فقط ويمنع استخدام أى أقلام ملونة.

Instructions

1. The Exam consists of 9 Pages of Different Questions, Instructions Page and Draft Page.
2. The questions are divided into three parts: Question 1, 2, 3 and 4.
3. Be sure of numbers of papers and numbers of questions.
4. Answer each question in its positions.
5. Use the blue pen only for your writing and do not use any colored pens.

With my best wishes

Question one

Choose the best correct answer for the following statements:

18 Marks

No.	Statement	Answer
1	Which of the following is not true about the Prokaryotic cells: a- Small cells (1 -10) µm. b- Contain sterols in their cytoplasmic membranes. c- Do not contain mitochondria. d- Contain 70 s ribosomes.	b
2	Which term is not used to describe the bacterial cell shapes: a- Coccus. b- Tetrads. c- Vibrio. d- Bacillus.	b
3	Bacterial pili are involved in: a- Motility. b- Adherence to host cells. c- Resistance to heat. d- Resistance to phagocytosis.	b
4	The 70 S prokaryotic ribosomes consists of: a- Two 40S subunit. b- A 50S and a 30S subunit. c- A 40S and a 30S subunit. d- A 50S and a 20S subunit.	b
5	Which of the following properties is shared by the prokaryotes and eukaryotes: a- Ribosome size. b- Presence of the cell membrane. c- Mitochondria structure and function. d- Nuclear envelope.	b
6	The bacterial cell membrane composed of all the following except: a- Phospholipids. b- Steroids. c- Carbohydrates. d- Protein.	b

7	Which of the following is true about the simple diffusion: a- Transfer charged molecules across the cell membrane. b- As temperature decrease the rate of diffusion decrease. c- Transfer large molecules across the cell membrane. d- Transfer molecules against concentration gradient.	b
8	Which of the following is not true about the facilitated diffusion: a- Transfer charged molecules across the cell membrane. b- Transfer molecules against concentration gradient. c- Molecules are transferred through protein channels or carriers. d- Transfer large molecules across the cell membrane.	b
9	Which of the following is not true about the bacterial capsules: a- They are consisting of secreted material lying outside of the bacterial cell wall. b- They are required for bacteria to grow normally in culture. c- They can prevent desiccation of bacterial cells. d- They help the bacteria to resist phagocytosis by macrophages.	b
10	4- Carrier proteins are required for: a- Osmosis. b- Facilitated transport. c- Active transport. d- Both B and C.	d
11	An organism is capable of oxidizing fatty acids to obtain energy, hydrogen, electrons and carbon. Which type of metabolism does this organism: a- Chemolithotrophic / autotroph. b- Photolithotrophic / autotroph. c- Photoorganotrophic / heterotroph. d- Chemoorganotrophic / heterotroph.	d
12	An organism is capable of photosynthesis but use organic matter as carbon source. Which type of metabolism does this organism: a- Photolithotrophic / autotroph. b- Chemoorganotrophic / heterotroph. c- Chemolithotrophic / autotroph. d- Photoorganotrophic / heterotroph.	d

13	**Osmophiles and Xerophiles are organisms that can grow in ..... and ..... respectively:** **a- Low sugar concentration … Dehydrated environments.** **b- Moderate temperatures … Alkaline pH.** **c- Low temperatures … Alkaline pH.** **d- High sugar concentration … Dehydrated environments.**	d
14	**Psychrophiles is a term referring to organism that best grow at:** a- Moderate temperatures. b- High temperatures. c- Neutral pH. d- Low temperatures.	d
15	**The endospore layer containing calcium and dipicolinic acid is the:** a- Core. b- Exosporium. c- Spore coat. d- Cortex.	d
16	**Starvation proteins are produced by a culture during which of the following parts of the growth curve:** a- Lag phase. b- Log phase. c- Decline phase. d- Stationary phase.	d
17	**A culture of bacteria produces 5 generations in 2 hours. What is the generation time for this bacterium under those conditions:** **a- 15 minutes.** **b- 80 minutes** **c- 30 minutes.** **d- 24 minutes.**	d
18	***Bacillus cereus* was inoculated in a culture medium with exactly 100 bacterial cells. After 3 hours, the bacterial cells became 6400 cells. What is the generation time:** **a- 20 minutes.** **b- 50 minutes.** **c- 2 hours.** **d- 30 minutes.**	d

Question two

Complete the following statements:

15 Marks

No.	Statement	Answer
A	.....(1)..... is an example of fungi that exist in a polymorphic shapes. It mainly infects ...(2)....., could be diagnosed by .....(3).....	1- Candida albicans 2- Mucous membranes 3- Morphological test
B	Athlete's foot is caused by .....(4)..... fungus	4- T. rubrum
C	Aflatoxins are examples of mycotoxins that are produced by the .....(5)..... species	5- Aspergillus
D	Antifungals usually targets .....(6)..... and... (7)..... in the cell wall or membrane of fungi.	6- Sterols 7- Glucans
E	The outer lipoprotein membrane possessed by many viruses is called .....(8).....	8- Envelope
F	The protective protein coat of a virus particle is called .....(9).....	9- Capside
G	.....(10).... and .....(11)..... are examples of enzymes present in the envelope of some viruses helping them in the penetration of host cells.	10- Neuramidinase 11- Haemagglutinin
H	Plaque is .....(12).....	12- Cells killed by viruses in tissue culture.
I	Prion is .....(13).....	13- Viral like infectious particles
J	After penetration of the virus particle tom the host cell, the event of removal of viral capsid followed by exposure of viral genome is called .....(14).....	14- Uncoating
K	The immune system is composed of two major subdivisions ...(15)..... and ...(16).....	15- Innate 16- Adaptive
L	The adaptive immune response is divided into two	17- Celluar

	systems ...(17)..... and .....(18).....	18- Humoral
M	Helper T cells detect infection and secretes signals called ...(19)..... that trigger the proliferation of both T cells and B cells.	19- Cytokines
N	The part of immunoglobulin that binds to the antigenic is named .....(20).....	20- Paratope
O	The heavy and light chains and the two heavy chains of antibodies are held together by .....(21).....	21- Disulphide bonds
P	The region at which the arms of the antibody molecule forms a Y is called .....(22).....	22- Hinge region
Q	Examples of antibodies having J-chain are .....(23).... and .....(24).....	23- IgA 24- IgM
R	.....(25)..... antibody plays a role in parasitic helminth diseases.	25- IgE
S	In the primary response the major class of Ab produced is ...(26)....., whereas in the secondary response it is .....(27).....	26- IgM 27- IgG
T	IgA found in secretions has protein associated with it called .....(28).....	28- Secretory protein piece
U	The part of antigen that binds to the antibody is named .....(29).....	29- Epitope
V	α-IFN and β-IFN induce uninfected cells to produce .....(30)..... that inhibit viral replication	30- Antiviral proteins (AVPs)

Question three

Mark the following statements true or false:

10 Marks

No.	Statement	Answer
1	During the lag phase of bacterial growth the bacterial cells are dividing regularly by binary fission.	F
2	Endospore formation is common among Gram-negative bacteria.	F
3	During the stationary phase of bacterial growth dead bacterial count is more than viable count.	F
4	Viruses can reproduce outside the host cells.	F
5	Reverse ranscriptase catalyzes the transcription of DNA to DNA.	F
6	Antigens are specific proteins formed in the body in response to antigenic stimulation.	F
7	Viruses are treated efficiently using antibiotics.	F
8	The cellular immune response involves antibodies and other proteins found in body fluid.	F
9	Humoral immune response involves the activation of phagocytes, antigen-specific cytotoxic T-lymphocytes.	F
10	Haptens are substances that react with the products of a specific immune response.	F
11	Viruses do not have nucleus, cytoplasm, mitochondria, or ribosomes.	T

12	The adaptive immunity is specific.	T
13	Memory T-cells secrete granules containing chemicals that destroy a targeted cell.	T
14	All immunoglobulins have a four chain structure as their basic unit, two identical light chains and two identical heavy chains.	T
15	IgA found in secretions is a dimer.	T
16	IgM has an extra domain on the μ chain (CH4) and it has another protein covalently bound called the J chain.	T
17	Proteins are good immunogenic agents.	T
19	Affinity refers to the strength of binding between a single antigenic determinant and an individual antibody combining site.	T
20	Avidity refers to the overall strength of binding between multivalent Ag's and Ab's.	T

Question four

Give the scientific name of following statements:

7 Marks

No.	Statement	Answer
1	Thread-like structures used to adhere bacteria to one another during mating.	Pili
2	Invaginations of the plasma membrane of Gram-positive bacterial cells.	Mesosomes
3	An apparatus used for the continuous cultivation of microorganisms.	Chemostate
4	The process by which the bacterial cell releases its waste products.	Exocytosis
5	Viruses which can infect the bacteria leading to bacterial death.	Bacteriophage
6	Proteins produced by some bacteria, which are lethal for other bacterial members.	Bacteriocin
7	Diffusion of water through a selectively permeable membrane from high to low concentration.	Osmosis
8	Bacteria that lose their cell wall under antibiotic therapy pressure & regain their cell wall after antibiotic withdrawal.	Spheroplast
9	The most common technique used to isolate bacterial	Streaking for

	mixtures.	isolation
10	Bacteria which are highly resistant to acids, staining and treatment.	Acid fast bacteria
11	The ingestion of dissolved materials by endocytosis.	Pinocytosis
12	Substances that can enhance the immune response to an immunogen.	Additives
13	Antigens which can directly stimulate the B cells to produce antibody without the requirement for T cell help.	T-independent
14	The number of antigenic determinants that an individual antibody molecule can bind.	Valency

Best of Luck