

15<sup>th</sup> May, 2018

Time allowed: 2 hours



MANSOURA UNIVERSITY  
FACULTY OF PHARMACY  
PHARMACEUTICAL AND BIOPROCEDURES EXAM (MPE492)  
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

15<sup>TH</sup> MAY, 2018  
TIME ALLOWED: 2 HOURS

### تعليمات

1. الامتحان يتكون من 9 صفحات تشمل على أسئلة مختلفة وصفحة تعليمات وصفحة مسودة.
2. أسئلة الامتحان مقسمة على 3 اجزاء.
3. يجب التأكد من عدد الصفحات وعدد الأسئلة قبل البدء في الإجابة.
4. يجب الإجابة على كل سؤال في مكان الإجابة المخصصة له.
5. يجب الإجابة باللون الأزرق فقط ويمنع استخدام أى أقلام ملونة.
6. لن يلتفت الى أى اجابات فى صفحة المسودة "Draft paper"

With my best wishes

Dr. Mohammed Asaad

15<sup>th</sup> May, 2018

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Question	A (15 Marks)	B (15 Marks)	C (20 Marks)	Total (50 Marks)
Marks				

Table for answers of Question B and C.					
Answers of Question B					
Question	Answer	Question	Answer	Question	Answer
1		6		11	
2		7		12	
3		8		13	
4		9		14	
5		10		15	
Answers of Question C					
Question	Answer	Question	Answer		
1		9			
2		10			
3		11			
4		12			
5		13			
6		14			
7		15			
8		16			
17					

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Question	A (15 Marks)	B (15 Marks)	C (20 Marks)	Total (50 Marks)
Marks				

**Table for answers of Question B and C.**

Answers of Question B					
Question	Answer	Question	Answer	Question	Answer
1	a	6	b	11	a
2	a	7	d	12	a
3	a	8	e	13	a
4	a	9	b	14	a
5	a	10	b	15	d
Answers of Question C					
Question	Answer	Question	Answer		
1	Autoclave	9	Cell culture techniques (cultivation of cell lines or viruses)		
2	Syringe filter	10	50 ml standing falcon tube		
3	Vacuum sterilization of liquids	11	Cell culture flask		
4	Preparation of solid media for bacteria	12	Incubator		
5	Laminar flow hood	13	Shaker incubator		
6	HEPA filter	14	1.5 ml eppendorf tube rotor		
7	50 ml falcon tube	15	Centrifuge		
8	Petri dish plate	16	Unbalanced rotor		
17	1- Mechanical sterilization (HEPA filter) 2- Physical: Radiation (UV lamp) 3- Physical : Dry heat (Bensen flame)				

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**A) Answer the following questions: (15 Marks)**

**1- You are a biomedical Engineer who have sold an autoclave to a microbiology lab.**

**a) What are the precautions you should tell the staff in the lab? (6 Marks)**

- Utilize containers and autoclave bags appropriate for autoclaving.
- Do not overfill containers unless porous separators are used.
- Autoclave clean items and waste separately.
- Always fill the autoclave with distilled water.
- Get rid of water used in sterilization after each time.
- Don't open the lid unless you are sure that the pressure in the gauge pressure is at 0 psi !!!

**b) What would be your answer? If one of the staff in the lab asked you about the function of:**

**- Discharge valve(2 Marks)**

Discharge valve is present to permit the escape of air from the chamber.

**- Safety valve (2 Marks)**

Safety valve calibrated to prevent exceeding of the pressure more than maximum allowable pressure in the autoclave.

**2- Classify the blood collecting tubes according the color and mention the component in each tube (5 Marks).**

Red color: No additive

Light blue: Contains citrate anticoagulant

Green: Contains Heparin anticoagulant

Violet: Contains EDTA anticoagulant


Orange: Contains coagulant

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**B) Choose the best answer from the following (15 Marks) and please transfer the answers to the table in Page 2 :**



- 1- The following symbol "  " on food means that:
  - a) It is sterilized by radiation.
  - b) It is a Bioproduct.
  - c) A and B.
  - d) None of the above.
- 2- You are a biomedical engineer in a hospital, and a lamp of device that is used for sterilization of rooms in hospitals is broken, then you would replace the broken one with :
  - a) Mercury vapor lamp.
  - b) Laser lamp
  - c) A source of radioactive radiation Cobalt 60.
- 3- The speed of shaking in shakers is measured in:
  - a) RPM
  - b) TBM
  - c) TAC
- 4- Fish could be preserved by addition of:
  - a) Sodium chloride
  - b) Boric acid
  - c) Chlorine
  - d) None of the above
- 5- Plastic syringes could be sterilized by:
  - a) Ethylene oxide
  - b) Tyndallization
  - c) Betadine
  - d) None of the above
- 6- Pyrogen test is carried out for the following pharmaceutical products:
  - A) Tablets
  - B) Injections
  - C) Creams
  - D) All of the above
- 7- Indicators of sterilization include:
  - a) Brownes tube
  - b) Paper tapes
  - c) Pyrogen
  - d) A and B
  - e) A, B, and C.
- 8- CO<sub>2</sub> incubators are used for cultivation of:
  - a) Anaerobic bacteria

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- b) Cell lines
  - c) Fungi
  - d) All of the above
  - e) A and B
- 9- Control of humidity in incubators is important for the growth of:
- a) Anaerobic bacteria
  - b) Cell lines
  - c) Fungi
  - d) All of the above
  - e) A and B
- 10- The -80 freezer is used for
- a) Long term cultivation of bacteria, fungi.
  - b) Long term storage of bacteria, fungi.
  - c) Intermediate cultivation of bacteria, fungi.
  - d) None of the above
- 11- The most efficient method for storage of cell lines is :
- a) Liquid nitrogen
  - b) -80 Freezer
  - c) -20 Freezer
  - d) None of the above
- 12- The cells responsible for immunity are called:
- a) White blood cells
  - b) Red blood cells
  - c) Platelets
- 13- Which of the following is correct regarding centrifugation:
- a) The lower the centrifugation time the greater the size of the pellet.
  - b) The greater the centrifugation force the lower the size of the pellet.
  - c) None of the above
  - d) Both A and B.
- 14- What is the most common method of sterilization applied to material implanted in human body ?
- a) Irradiation.
  - b) Dry heat.
  - c) Mechanical sterilization.
  - d) Ethylene oxide.
- 15- What is the method of sterilization applied to Pacemakers?
- a) Irradiation.
  - b) Cold chemicals.
  - c) Ethylene oxide.
  - d) All of the above.

**C) The following figures (A-O) are examples for devices, part of devices or consumables that you should be aware of as a biomedical Engineer. Please only answer the following questions in the table in Page 2. (20 Marks)**

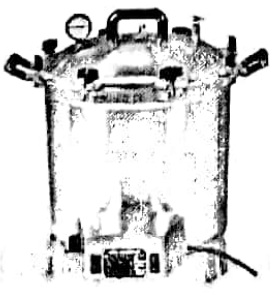
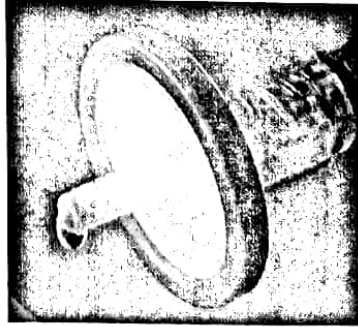
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➤ Questions:


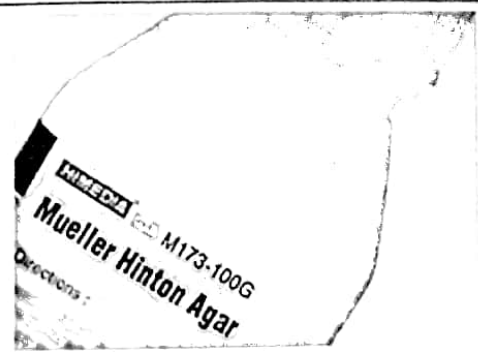
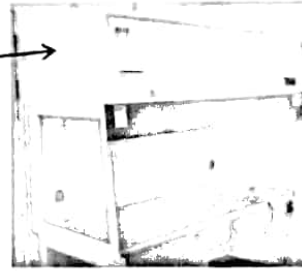
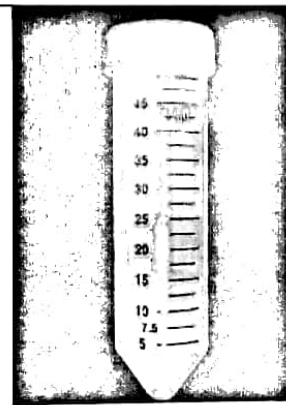
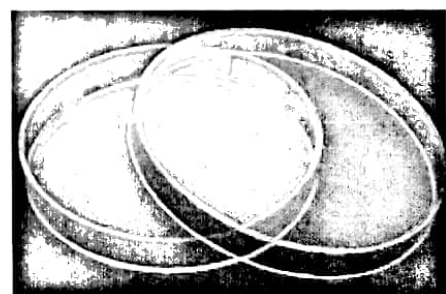
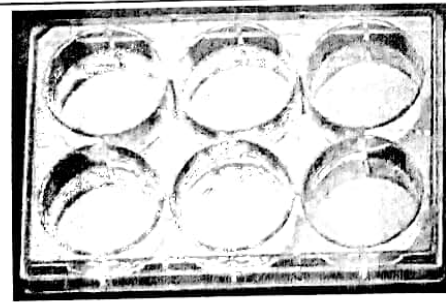
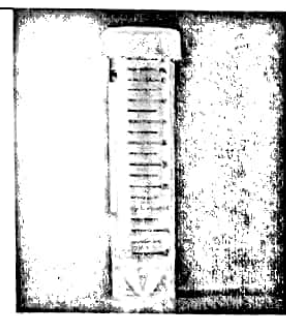
- 1- What is the name of device in figure A?
- 2- What is the name of consumable in figure B?
- 3- What is the use of consumable in figure C?
- 4- What is the use of consumable in figure D?
- 5- What is the name of device in figure E?
- 6- What is the name of part X inside the device in figure E?
- 7- What is the name of consumable in figure F?
- 8- What is the name of consumable in figure G?
- 9- What is the use of consumable in figure H?
- 10- What is the name of consumable in figure I?
- 11- What is the name of consumable in figure J?
- 12- What is the name of device in figure K?
- 13- What is the name of device in figure L?
- 14- What is the name of part of device in figure M?
- 15- What is the name of device in figure N?
- 16- What is the problem in device in figure O?
- 17- Mention three mechanisms of sterilization that could be found in the device of figure E?

➤ Figures:

Symbol	Figure	Symbol	Figure
A		B	

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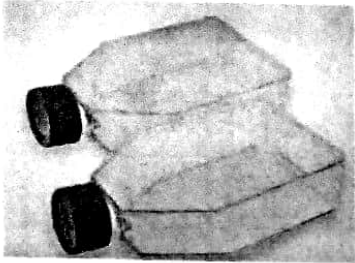
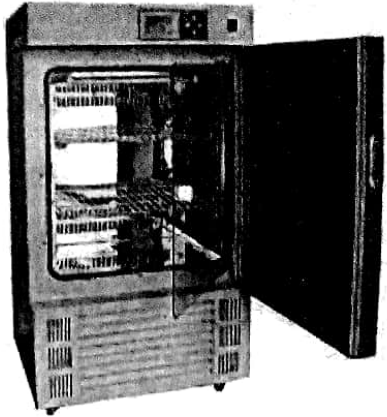
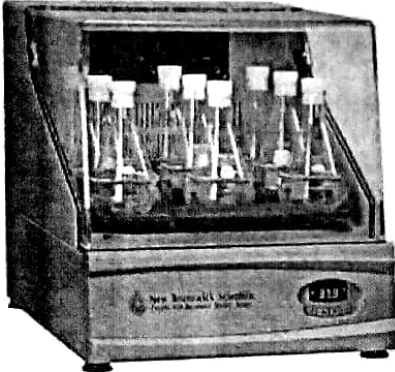
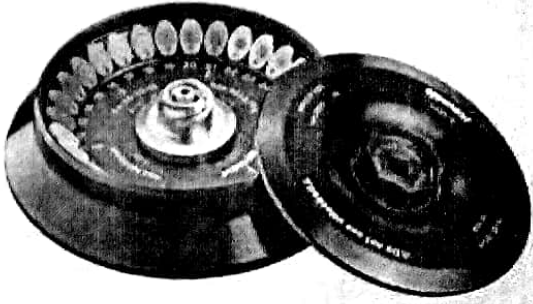

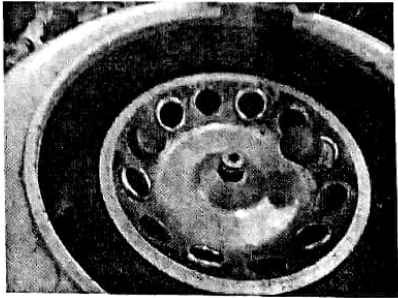
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C		D	
E			
F		G	
H		I	



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J		K	
L		M	
N		O	

Good Luck

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