



Biomedical Engineering

Biopharmaceutical measures
Course Code : BME 492
Level : 400
Allowed Time : 2 hours
Second Semester 2016 /2017
Final term exam
50 marks



Faculty Of Engineering
08-06-2017

Part (1) (25 marks, 1 hour)

Question (1): Give the name for each of the following:

(14 marks, 1 mark/each)

	Sentence	Answer
1	The simplest and most economical device to provide aseptic conditions in cell culture lab.	Laminar flow cabinet
2	The type of WBCs that releases histamine to remove foreign bodies from the body	Basophils
3	A glycoprotein hormone produced by the kidney to regulate erythrocyte production.	erythropoietin(EPO)
4	A condition of haemoglobin change due to exposure to sulphonamides.	Methaemoglobinaemia
5	The part of antigen binding to the antibody.	epitope
6	The type of WBCs stained by acidic dye.	Eosinophils
7	The antibody that is present in the blood of person with B blood group.	A antibody
8	The type of immunity triggered by T lymphocytes.	cell mediated immunity
9	The blood group of the universal blood recipient.	AB ⁺
10	The type of cells that grow floating in the culture medium.	Suspension cells
11	The type of air flow in cabinet that is characterized by increased turbulent effect of air striking.	Vertical laminar flow
12	The best type of incubator required in cell culture.	CO2 incubator
13	The step of ELISA including addition of irrelevant protein or other molecule to cover all unsaturated surface-binding sites.	Plate blocking
14	The first antibody required for sandwich ELISA that is bound to plate.	Capture (coating) antibody



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Question (2): Complete all the following sentences:

(6 marks, 0,5 mark/each)

- 1- Polycythaemia is characterized by an increase in RBCs and HB leading to an increase in blood viscosity
- 2- Safety laboratory recommendations include changing gloves after use and decontaminate all work surfaces before and after your experiments.
- 3- The cabinet in cell culture is usually supported with UV lamp for sterilization before and after work.
- 4- Cryopreservation requires a special cryoprotective agent such as DMSO
- 5- To obtain whole blood, blood sample should be mixed immediately with anticoagulant and the supernatant is known as plasma
- 6- During sample processing, repeated freezing-thawing cycle should be avoided.
- 7- The two commonly used enzymes for detection in ELISA method are alkaline phosphatase and HRP

Question (3): Answer all the following questions:

(5 marks)

1- Mention in brief why blood PH remains at 7.4.

(2 marks)

7.4 and it is constant due to the buffering action of:

1-in plasma: acidic and basic phosphate

2-in red blood cells: 1-oxygenated HB

2-carbonates

2- Mention in brief the function of submembrane cytoskeleton of RBCs.

(1 mark)

It gives the red cell its shape and its ability of deformation while passing through the narrow blood capillaries.



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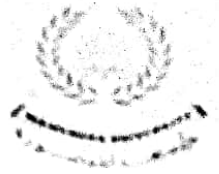
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3- Mention in brief the effect of agglutinated blood due to incompatible blood transfusion. (2 marks)

- 1- clog blood vessels and stop the circulation of the blood to various parts of the body.
- 2- The agglutinated red blood cells also crack and its contents leak out in the body.