

VU Medical Zone

BIO 204 Final Term Current Fall 2020

Question No : 1 of 37 Marks: 1 (Budgeted Time Min)

Growth phase of an organism include.....

Answer (Please select your correct option)

☐ The balanced phase

☐ The storage phase

☐ The maintenance phase

☒ All

Answer solved by Amaan Khan
Contact: 0305-4716616
Email: maniamaan2@gmail.com

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Activate Windows
Go to Settings to activate Windows.

Effort By Amaan Khan

VU Medical Zone

BIO204 Principles of Biochemical Engineering

Question No : 2 of 37

Marks: 1 (Budgeted Time Min)

Air flow rates are typically reported in terms of.....?

Answer (Please select your correct option)

☒ V_{vm}

Answer solved by Amaan Khan
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☐ V_{mu}

☐ V_{ml}

☐ V_{mv}

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BIO204 Principles of Biochemical Engineering

Question No : 3 of 37 Marks: 1 (Budgeted Time Min)

Stenlization is a

Answer (Please select your correct option)

- ☒ Removal or destruction of all living microorganisms
- ☐ Culture of a certain organism
- ☐ Contaminant may produce compounds
- ☐ Foreign organism may contaminate the final product

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Answer Saved Successfully!

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Navigation icons: Info, Previous, Next, etc.

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Question No : 4 of 37

Marks: 1 (Budgeted Time 10)

The endospores of the genus *Bacillus* are far more heat resistant than the _____?

Answer (Please select your correct option)

☒ Vegetative cells

☐ Non Vegetative cells

☐ Reproductive cells

☐ Non Reproductive cells

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BIO204 Principles of Biochemical Engineering

Question No : 5 of 37 Marks: 1 (Budgeted Time Min)

In N_0/N_t as a design criterion for sterilization, which has been variously called

Answer (Please select your correct option)

<input checked="" type="radio"/>	Del factor
<input type="radio"/>	Sigma factor
<input type="radio"/>	Lambda factor
<input type="radio"/>	Nei factor

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Question No : 6 of 37

Marks: 1 (Budgeted Time Min)

Which one of the following scientist demonstrated the use of a graphical method of integration?

Answer (Please select your correct option)

☒ Richards

☐ Deindoefer

☐ Humphrey

☐ Newton

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6

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Question No : 7 of 37

Marks: 1 (Budgeted Time Min)

From the data of Deindoerfer and Humphrey (1961) the specific death rate of *B. stearothermophilus* spores at _____

Answer (Please select your correct option)

☒ 121°C is 2.54 min-1

☐ 125°C is 3.54 min-1

☐ 120°C is 1.54 min-1

☐ 123°C is 0.54 min-1

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7

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BIO204 Principles of Biochemical Engineering

Question No : 8 of 37 **Marks: 1 (Budgeted Time Min**

If a pilot sterilization were carried out in a 1000 dm³ vessel with a medium containing 10⁶ organisms cm⁻³ requiring a probability of contamination of 1 in 1000, the Del factor would be

Answer (Please select your correct option)

- ☐ 34.9
- ☐ 35.5
- ☐ 30.4
- ☒ 34.5

Answer solved by Amaan Khan
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BIO204 Principles of Biochemical Engineering

Question No : 9 of 37 **Marks: 1** (Budgeted Time Min

An ideal way to sterilization media for animal cell culture is

Answer (Please select your correct option)

☐ Steam sterilization

☒ Filtration

☐ Heating

☐ Boiling for 20 minutes

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BIO204 Principles of Biochemical Engineering

Question No : 10 of 37

Marks: 1 (Budgeted Time M

The most common construction material used for the pleated membranes for air sterilization is _____

Answer (Please select your correct option)

☒ Poly tetrafluoroe thylene (PTFE)

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☐ Poly acryl

☐ Poly ethylene

☐ Polytetrahydrofuran

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Question No : 11 of 37

Marks: 1 (Budgeted Time Min)

Which of the following technique for the in-situ recovery of salicylic acid and antibiotics

Answer (Please select your correct option)

☐ Vacuum and flash fermentations

☐ Extractive fermentation

☐ Adsorption

☒ Ion-exchange

Answer solved by Amaan Khan
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Navigation icons: info, back, forward

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BIO204 Principles of Biochemical Engineering

Question No : 12 of 37

Marks: 1 (Budgeted Time Min)

In sludges containing solid matter, 80% of the degradable matter may be digested, which will reduce the solids content by-----

Answer (Please select your correct option)

☐ 20%

☐ 30%

☐ 40%

☒ 50%

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BIO204 Principles of Biochemical Engineering

Question No : 13 of 37

Marks: 1 (Budgeted Time Min)

The main objective of the first stage for the recovery of an extracellular product is the removal of large solid particles and microbial cells usually by _____

Answer (Please select your correct option)

☒ Centrifugation or filtration

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☐ Ultrafiltration

☐ Reverse osmosis

☐ Ion-exchange

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Question No : 14 of 37

Marks: 1 (Budgeted Time 1M)

In filtration system, _____ is 0.5 μ m absolute rated pre-filter for bulk bioburden removal.

Answer (Please select your correct option)

Filter 1.
☐

Filter 2.
☒

Filter 3.
☐

Filter 4.
☐

Answer solved by Amaan Khan
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14

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Question No : 15 of 37 Marks: 1 (Budgeted Time M

_____ is the most common method used for killing microbes, including the most resistant forms, such as endospores

Answer (Please select your correct option)

☒ Heating

☐ Filtration

☐ Radiations

☐ Use of chemical

Answer solved by Amaan Khan
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Principles of Biochemical Engineering

Question No : 16 of 37

Marks: 1 (Budgeted Time Min)

Excessive foam formation can lead to _____

Answer (Please select your correct option)

- ☐ blocked air exit filters
- ☐ pressure build up in the reactor
- ☐ damage to the reactor
- ☒ All of these

Answer solved by Amaan Khan
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Info, Previous, Next icons

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BIO204 Principles of Biochemical Engineering

Question No : 17 of 37

Marks: 1 (Budgeted Time Min)

Which of the following is an advantage of batch sterilization over continuous sterilization?

Answer (Please select your correct option)

☒ Ease of scale-up

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☐ The reduction of surge capacity for steam

☐ The reduction of sterilization cycle time

☐ Easier manual control

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BIO204 Principles of Biochemical Engineering

Question No : 18 of 37

Marks: 1 (Budgeted Time Min)

Foam is typically detected by using conductivity or level probe in fermenter.

Answer (Please select your correct option)

☒ two

☐ one

☐ three

☐ single

Answer solved by Amaan Khan
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18

18

18

18

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Types of Biochemical Engineering

Question No : 19 of 37 BC1704

Marks: 1 (Budgeted Time Min)

The _____ are not subject to removal from the vessel but will consume substrate resulting in the suspended biomass concentration being lower than predicted

Answer (Please select your correct option)

☐ Product

☐ Biomass

☐ All

☒ Immobilised cells

Answer solved by Amaan Khan
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Email: maniamaan2@gmail.com

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Answer Saved Successfully!

19

Question Summary : (Attempted Question)

19 20 21 22 23 24 25 26 27 28 29 30 31 32 3

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BIO204 Principles of Biochemical Engineering

Question No : 20 of 37

Marks: 1 (Budgeted Time Min)

Most microbial fermentations use

Answer (Please select your correct option)

☐ Open impeller

☐ Closed impeller

☐ Semi-open impeller

☒ Rushton turbine impeller

Answer solved by Amaan Khan
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Email: maniamaan2@gmail.com

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Answer Saved Successfully!

20

Question Summary : (Attempted Question)

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

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BIO204 Principles of Biochemical Engineering

Question No : 21 of 37

Marks: 1 (Budgeted Time Min)

The activation energy for the thermal destruction of *B. stearothermophilus* spores has been cited as

Answer (Please select your correct option)

☐ 10 kcal mole⁻¹

☒ 67.7 kcal mole⁻¹

☐ 50 kcal mole⁻¹

☐ 100 kcal mole⁻¹

Answer solved by Amaan Khan
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21

21 22 23 24 25 26 27 28 29 30

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BIO204 Principles of Biochemical Engineering

Question No : 22 of 37

Marks: 1 (Budgeted Time Min)

Extra plate can be added in indirect plate heat exchanger to increase its

Answer (Please select your correct option)

☐ size

☒ capacity

☐ cooling

☐ pressure

Start Time: 10:01 AM

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Navigation icons: Previous, Next, Active, Go to 30

Question list: 22, 23, 24, 25, 26, 27, 28, 29, 30

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Principles of Biochemical Engineering

Question No : 23 of 37 Marks: 1 (Budgeted Time)

Growth kinetics refers to the change in number or size of organisms with respect to _____

Answer (Please select your correct option)

☐ Death rate

☐ Growth rate

☒ Time

☐ Size

Answer solved by Amaan Khan
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23

Question Summary : (Attempted Question)

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BIO204 Principles of Biochemical Engineering

Question No : 24 of 37 Marks: 1 (Budgeted Time M

A viable cell is defined as a cell which is able to divide and increase _____

Answer (Please select your correct option)

☐ Cell Growth

☒ Cell numbers

☐ cell size

☐ Cell Cycle

Answer solved by Amaan Khan
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24

Question Summary : (Attempted Question)

20 21 22 23 24 25 26 27 28 29 30

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Principles of Biochemical Engineering

Question No : 25 of 37

Marks: 1 (Budgeted Time Min)

Specific rate of substrate uptake for cellular growth is denoted by _____

Answer (Please select your correct option)

☒ m

☐ M

☐ Nc

☐ Mc

Answer solved by Amaan Khan
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Start Time: 10:01 AM

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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BIO204 Principles of Biochemical Engineering

Question No : 26 of 37

Marks: 1 (Budgeted Time M)

Which fermenter is used in academic lab commonly?

Answer (Please select your correct option)

☐ Tower

☒ Koji

☐ Tray

☐ Stirred

Start Time: 10:01 AM

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Answer Saved Successfully!

26

Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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BIO204 Principles of Biochemical Engineering

Question No : 27 of 37

The diameter of the Rushton turbine should be _____ of the tank diameter.

Marks: 1 (Budgeted Time Min)

a. b. c. d.

Answer (Please select your correct option)

☐ 1/2

☐ 1/5

☒ 1/3

☐ 1/4

Answer solved by Amaan Khan
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36:00 Time Left

Answer Saved Successfully!

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Question Summary : (Attempted Question)

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Impeller is an axial flow impeller which is used for microbial fermentation. Marks: 1 (Budgeted Time 10:01 AM)

Answer (Please select your correct option)

☐ Vertical

☐ Horizontal

☒ Axial

☐ Intermix

Answer solved by Amaan Khan
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Answer Saved Successfully!

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Attempted Question

16 17 18 19 20 21 22 23 24 25 26 27

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Question No : 29 of 37

Marks: 1 (Budgeted Time)

Fermentation waste can be treated by how many methods?

Answer (Please select your correct option)

☐ Six

☐ Five

☐ Four

☒ Three

Answer solved by Amaan Khan
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Email: maniamaan2@gmail.com

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Question Summary : (Attempted Question)

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

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BIO204 Principles of Biochemical Engineering

Question No : 30 of 37

Biological oxygen demand is abbreviated as _____

Marks: 1 (Budgeted Time 1 min)

Answer (Please select your correct option)

☐ "BoD"

☐ {Bod}

☐ bod

☒ BOD

Start Time: 10:01 AM

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Summary : (Attempted Question)

13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

Answer solved by Amaan Khan
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BIO204 Principles of Biochemical Engineering

Question No : 31 of 37 **Marks: 2 (Budgeted Time)**

How can sterilized the fermenter exhaust air?

Answer (Please click here to Edit Answer)

Normal Arial 12 B I U

In many traditional fermentation the axhaust air from the fermentation was vented without sterilization or ve depth filter.

Start Time: 10:01 AM

27:00

31

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BIO204 Principles of Biochemical Engineering

Question No : 32 of 37

Marks: 2 (Budgeted Time Min)

Write down the advantages of continuous sterilization?

Answer ([Please click here to Edit Answer](#))

Advantages:

1. Ease scale-up discussed later.
2. Easier automatic control.
3. The reduction of surge capacity for steam.

Start Time: 10:01 AM

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Answer Saved Successfully!

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24 25 26 27 28 29

BIO204 Principles of Biochemical Engineering

Question No : 33 of 37

Marks: 3 (Budgeted Time 10:00)

Write down the effects of increased sterilization time on product yield and nutrient quality of medium?

Answer ([Please click here to Edit Answer](#))

Normal Arial 12 B I U

Maintaining the same nutrient quality on a small and large scale can be achieved in batch sterilization only because the volume of the vessel, which is totally unacceptable.
Thus, the decrease in the yield of fermentation when it is scaled up is often due to problems of nutrient degradation during sterilization.

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Answer Saved Successfully!

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BIO204 Principles of Biochemical Engineering

Question No : 34 of 37

Marks: 3 (Budgeted Time M)

Write down the advantages of anaerobic treatment of organic waste materials.

Answer (Please Add Answer) (Use ctrl+C and ctrl+V to copy & paste)

100%

Normal Arial 12 B I U

1. Higher loading rates can be achieved than are possible for aerobic treatment of organic waste materials.
2. Lower power requirement may be needed for unit of BOD treated.
3. Organic matter is metabolized to a stable form.

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22 23 24 25 26 27 28

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BIO204 Principles of Biochemical Engineering

Question No : 35 of 37

Marks: 5 (Budgeted Time)

Briefly discuss the batch culture and continuous culture.

Answer ([Please click here to Edit Answer](#))

Normal Arial 12 B I U

Batch culture:
In batch processing, a batch of culture medium in a fermentor is inoculated with a microorganism. Fermentation duration. It is closed system which contain initial limited amount of nutrient.

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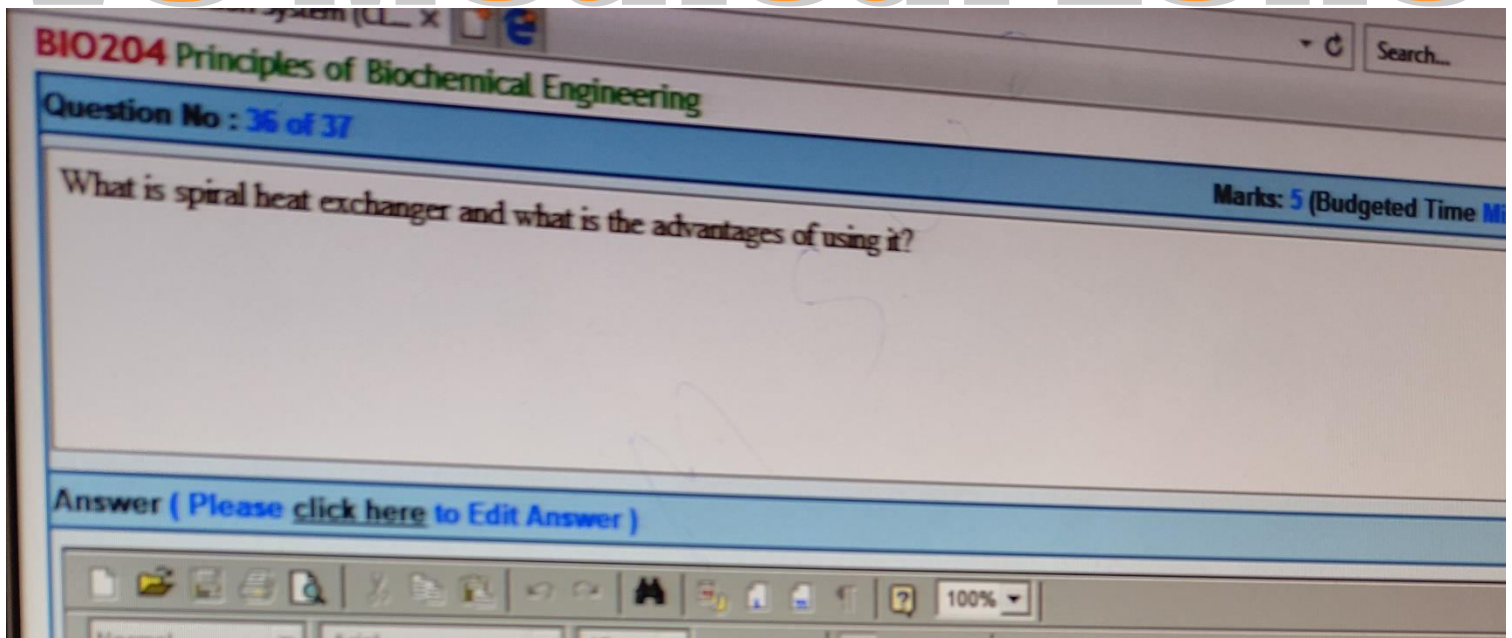
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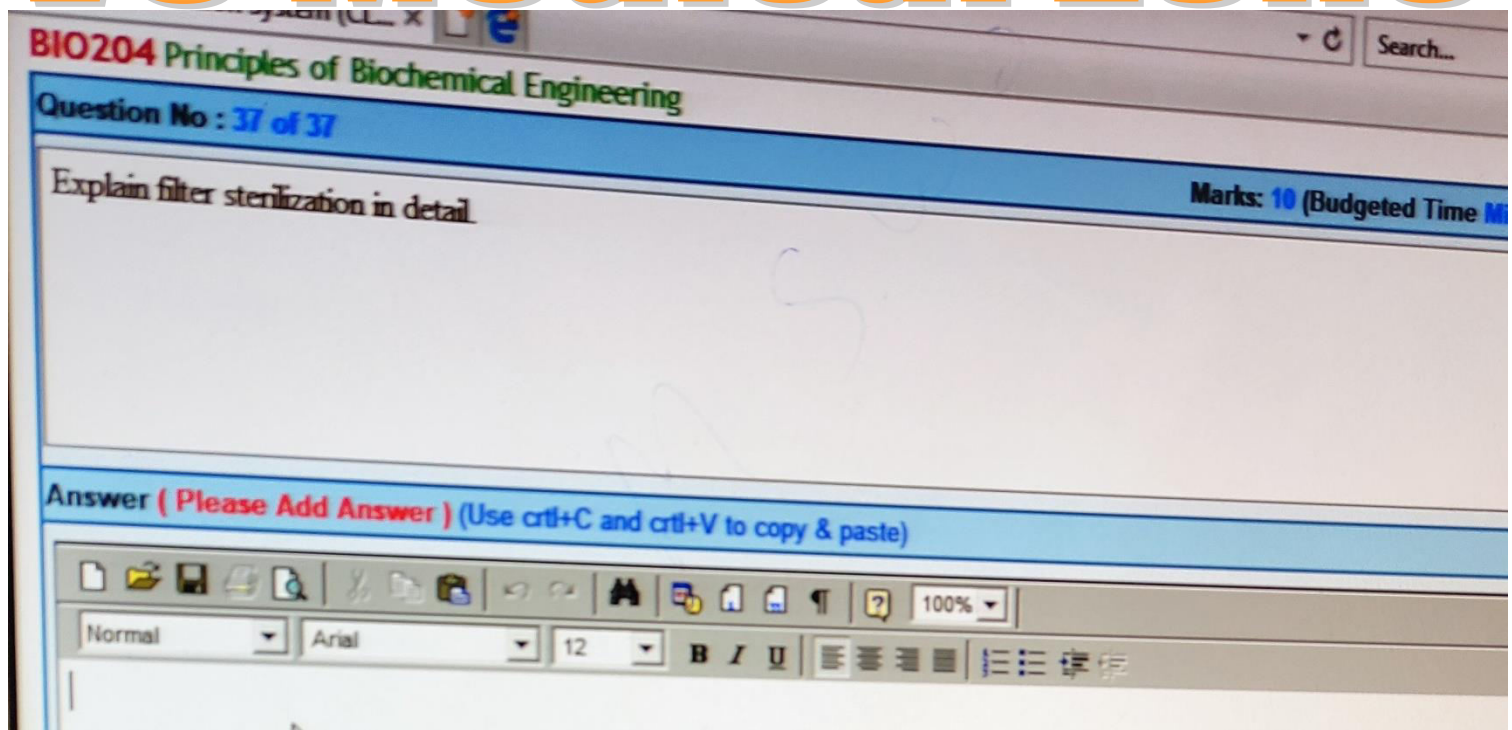
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Spiral heat exchangers are also used to cool the medium after passing through the holding coil. Incoming unsterile medium is used as the cooling agent in the first cooler so that the incoming medium is partially heated before it reaches the sterilizer and, thus, heat is conserved.

- i. The two streams of medium and cooling liquid, or medium and steam, are separated by a continuous stainless steel barrier with gasket seals being confined to the joints with the end plates. This makes cross contamination between the two streams unlikely.
- ii. The spiral route traversed by the medium allows sufficient clearances to be incorporated for the system to cope with suspended solids. The exchanger tends to be self cleaning which reduces the risk of sedimentation, fouling and 'burning on'.



Suspended solids maybe separated from a fluid during filtration by the following mechanisms:

- i. Inertial impaction.
- ii. Diffusion.
- iii. Electrostatic attraction.
- iv. Interception.

Inertial Impaction

Suspended particles in a fluid stream have momentum. The fluid in which the particles are suspended will flow through the filter by the route of least resistance. However, the particles, because of their momentum, tend to travel in straight lines and may therefore become impacted upon the fibers where they may then remain. Inertial impaction is more significant in the filtration of gases than in the filtration of liquids.

Diffusion

Extremely small particles suspended in a fluid are subject to

Brownian motion which is random movement due to collisions with fluid molecules. Thus, such small particles tend to deviate from the fluid flow pattern and may become impacted upon the filter fibers. Diffusion is more significant in the filtration of gases than in the filtration of liquids.

Electrostatic attraction

Charged particles may be attracted by opposite charges on the surface of the filtration medium.

Interception

The fibers comprising a filter are interwoven to define openings of various sizes. Particles which are larger than the filter pores are removed by direct interception. However, a significant number of particles which are smaller than the

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filter pores are also retained by interception. This may occur by several mechanisms – more than one particle may arrive at a pore simultaneously, an irregularly shaped particle may bridge a pore, once a particle has been trapped by a mechanism other than interception the pore may be partially occluded enabling the entrapment of smaller particles. Interception is equally important a mechanism in the filtration of gases and liquids.