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Pretest ….. definition thi ak word missing tha

Which one is not the ethical right of the participants .

Element ki definition thi r jst name missing tha

First step in research method …

……offers more heterogeneity in groups

Bt402

What are the physical factors of microbial environment?2 mark

- Physical factors
- Temperature
- Humidity
- Ph
- viscosity

Why pants use nitrates?2 mark

- **they need nitrates to make amino acids**
- **Pea and bean plants use bacteria Rhizobiumwhich directly convert nitrogen into acid amino**

What are the physiological factors of strain production?3 mark

Physiological Factors:

- **Morphology**
- **Metabolic by-products**
- **Shear Sensitivity**
- **Genetic Stability**
- **Issues in production strain:**

What is the importance of mirobial genomics and the micmicrobial biotechnology? 5 mark

Write two names of pharmaceutical drugs produced by microbs and how these are produced?5

- Many pharmaceutical drugs are also produced by microbes e.g. Cyclosporin A, that is used as an immunosuppressive agent in organ-transplant patients, is produced by the fungus *Trichoderma polysporum*.
- Statins produced by the yeast *Monascus purpureus* have been commercialised as blood-cholesterol-lowering agents. It acts by competitively inhibiting the enzyme responsible for the synthesis of cholesterol.

mark Name the vatimns produced by microbs? 3 mark

- Vitamins are some organic compounds which are capable of performing many life-sustaining functions inside our body.
- These compounds cannot be synthesised by humans, and therefore, they have to be supplied in small amounts in the diet.
- Microbes are capable of synthesizing these compounds and hence they can be used for the commercial production of many of the Vitamins e.g. thiamine (Vitamin $B_{1)}$, riboflavin (Vitamin B_2)

BT402 (Microbial Biotechnology)
Total Q 26 (40 marks)
20 Mcqs
4 short Q (2 and 3 marks)
1. Why plants need nitrates? (2 marks)
2. What are different types of microbes? (2 marks)

3. Role of microbes in Meat industry? (3 marks)

Meat starter cultures are used to make dried, fermented products
• such as salami, Salami is a type of cured sausage consisting of fermented and air-dried meat, typically beef or pork.

• pepperoni, Pepperoni is an American variety of salami, made from cured pork and beef mixed together and seasoned with paprika or other chili pepper.
• dried ham, **Ham** is pork that has been preserved through salting, smoking, or wet curing
• Lactic bacteria develop the flavour and colour of the products.
• In addition, a wide variety of moulds are used
• to ripen the surface of sausages,
• preserving the natural quality of the product
• and controlling the development of flavour

4. Write physiological factors in strain? (3 marks)

Long Q (5 marks)

1. Importance of microbial genomics and microbial biotechnology (5)
2. Name two pharmaceutical drugs and describe how are they produced (5)

BT402
name two pharmaceutical drug? and how it produced from microbes?
name physiological effects in strain?

Physiological Factors
• Morphology
• Metabolic by-products
• Shear Sensitivity
• Genetic Stability
• Issues in production strain:

what is importance of microbial genomics and microbial biotechnology ?
How microbes are benefical for human body?
Alcholic fermentation?

Done by
• Yeast and certain bacteria
• Pyruvate is broken into alcohol and carbon dioxide
• Used in the production of beer, wine and bread

bki yad nh

BT402 (Microbial Biotechnology)
Timing 12:00
Total Q 26 (40 marks)
20 Mcqs
4 short Q (2 and 3 marks)
1. What are steroids? (2 marks) (ans on topic 26)
Steroids
• **Steroids** are a very important group of chemicals, which are used as anti-inflammatory

drugs, and as hormones such as ***estrogens*** and ***progesterone***, which are used in oral contraceptives.
• Producing steroids from animal sources or chemically systhesising them is difficult, but microorganisms can synthesise steroids from **sterols** or from related compounds.

2. What is bio processing of microbes?
(2 marks) (ans on topic 7)

Bio processing of microbes
• Application of natural or genetically manipulated whole cells/ tissues/ organs, or parts thereof, for the production of industrially or medically important products. Encompasses research, development, manufacturing, and commercialization of products prepared by using biological systems
• Issues of microorganisms in bio processing
1st Step:
• Isolation of Pure or Mixed Cultures from nature
2nd Step:
Assesment to determine the capacity for the production
Issues of microorganisms in bio processing.

3. What is lactic acid fermentation? (3 marks) (topic 25)

Lactic acid fermentation causes you to feel a burning sensation in your working muscles during exercise but not after. ... Your body at work uses muscles, which require constant fueling of oxygen in a process called aerobic metabolism where energy is generated from the muscles using oxygen.

4. Write physiological factors in strain? (3 marks) (topic
Long Q (5 marks)
1. Importance of microbial genomics and microbial biotechnology (5) (topic 4)
2. Name two pharmaceutical drugs and describe how are they produced (5) (ans on topic 26)

Bt402
1:Two pharmaceutical drugs n their production5
2:importance of microbial ginomics n biotechnology5
3:physiological factors3
4:physical factors2
5:steroids2
6:microbs are beneficial for human body3

In recent years, **probiotic cultures** have become popular in dairy products because of their health benefits.
• These cultures are all very carefully selected strains, and there is good evidence that they help improve digestion, safeguard the immune system, and keep the body's intestinal flora in balance.

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BT402:-

1: What is Pharmaceutical drugs?
2: What is the benefical of micro organisms?
3:What is the physiological factors of production in strain?
4: What is the importnace of Microbial genome and microbial biotechnology?
5: What is the importnace of micro organisms?
ek yd nhi
Mcqs are easy

BT402

1. What are steroids?

Steroids

• **Steroids** are a very important group of chemicals, which are used as anti-inflammatory drugs, and as hormones such as ***estrogens*** and ***progesterone***, which are used in oral contraceptives.
• Producing steroids from animal sources or chemically systhesising them is difficult, but microorganisms can synthesise steroids from **sterols** or from related compounds

2. How animals digest cellulose.

IN DIGESTION
• ONE OF THE MAIN COMPONENT OF PLANT IS CELLULOSe.

Cellulose is hard to digest by the animal…
• How they digest the cellulose…?
• Cellulose can be digest by enzyme named cellulase.
• How they can get cellulase?
• Herbivores depend on bacteria that live in their stomach to digest cellulose
• This bacteria secretes (merembeskan) cellulase into the stomach

3. Use of Microbes in Medicine

MEDICINE
• Some type of microorganism produce important drugs called ANTIBIOTICS.
• Functions of antibiotics….
• Weaken, Destroy other microorganism
• Penicillium notatumis a GREEN MOULD
• Its produces antibiotic called PENICILLIN
Genetically engineered bacteria

• Some bacteria have been genetically engineered
• Why?
• To produce certain vaccines that are used to prevent infectious diseases
• Insulin, produced to treat diabetes

4. Psychological Factors in Strain improvement.

Physiological Factors
• Morphology
• Metabolic by-products
• Shear Sensitivity
• Genetic Stability
• Issues in production strain:

5. Importance of Microbial Genomics and microbial Biotechnology.

Microbial genomics and microbial biotechnology research is critical for advances in food safety, food security, biotechnology, value-added products, human nutrition and functional foods, plant and animal protection, and furthering fundamental research in the agricultural sciences. Microbial biotechnology, enabled by genome studies, will lead to breakthroughs such as
improved vaccines and better disease-diagnostic tools, improved microbial agents for biological control of plant and animal pests, modifications of plant and animal pathogens for reduced virulence, development of new industrial catalysts and fermentation organisms, and development of new microbial agents for bioremediation of soil and water contaminated by agricultural runoff.

Application of scientific and engineering principles to the processing of materials by microorganisms to create useful products or processes
• Microorganisms utilized may be natural isolates, laboratory selected mutants or microbes that have been genetically modified using recombinant DNA methods
• Deals with the prevention of deterioration of processed or manufactured good, environmental protection and waste disposal system
• Production of antibiotics, organic acids and enzymes by fermentation of microbes

6. Name Pharmaceutical Drugs produced by microbes.

Pharmaceutical Drugs
• Many pharmaceutical drugs are also produced by microbes e.g. **Cyclosporin A**, that is used as an immunosuppressive agent in organ-transplant patients, is produced by the fungus *Trichoderma polysporum*.
• **Statins** produced by the yeast *Monascus purpureus* have been commercialised as bloodcholesterol-lowering agents. It acts by competitively inhibiting the enzyme responsible for the synthesis of **cholesterol**.

Bt402
How microbe are economically important? 2

Why plants need nitrates? 2

AGRICULTURE
• Bacteria play important roles to promote the plant growth.
• Bacteria, Break down dead plants and dead animals by releasing AMMONIA
• AMMONIA, Adds nitrogen into the soil
• The nitrogen fixing bacteria in the soil change the ammonia into nitrates.
• This nitrates will be used by plants

How microbe are important inside human body ? 3

In our bodies, different microbes help to digest food, ward off invasive organisms, and engage in skirmishes and pitched battles with the human immune system in the give-andtake of the natural disease process.

Name physicological factor involved in strain development ? 3 repeat.
Write importance of microbial genomics and microbial biotechnology?5
Name any two pharmaceutical drug and how they are produced in microbes?5
Bt402
How microbes are important in industry (2)

Dairy industry
• It would be impossible to make **cheese** without a starter culture.

The production of cheese utilizes starter cultures being added to milk with the aim of producing semi-hard and hard cheeses
• •
The starter cultures produce lactic acid, resulting in a pH decrease in the milk and promoting curd synthesis
• **Yogurt** is also a fermented milk product, which takes advantage of lactic acid generating bacteria cultures Lactobacillus and their use of lactose in milk as a substrate to produce lactic acid
• In **yoghurt** and other fermented milk products, the culture is responsible for the taste and texture of the final product.
• In recent years, **probiotic cultures** have become popular in dairy products because of their health benefits.
• These cultures are all very carefully selected strains, and there is good evidence that they help improve digestion, safeguard the immune system, and keep the body's intestinal flora in balance.

What are steroids (2)

What is alcoholic fermentation (3)

Lactic acid fermentation
• occurs in animal muscles when the tissue requires energy at a faster rate than oxygen can be supplied
• used to convert lactose into lactic acid in yogurt and cheese production

• also gives the sour taste to fermented vegetables such as pickles

Name physiological factors in strain development (3)

Importance of microbial genomics and microbial biotechnology (5)

Name two pharmaceutical drugs and describe how are they produced (5)

Read the 26th ppt thoroughly, most questions came from this ppt

Topic-26

Role of microorganisms in industries

• Microbes are widely used in large-scale industrial processes

• microbes are used to synthesise a number of products valuable to human beings.

• This Industry has provided products that have profoundly changed our lives and life spans.

• These products include beverages, food additives, products for human and animal health, and biofuels.

Beverages

• Microbes especially yeast have been used from time immemorial for the production of beverages like **Wine**, **Beer**, **Whisky**, **Brandy**or **Rum**.

• For this purpose, the yeast *Saccharomyces cerevisiae*(commonly called **Brewer's yeast**) is used for fermenting malted cereals and fruit juices to produce ethanol.

Antibiotics

• **Antibiotics** produced by microbes are regarded was one of the most significant discoveries of the twentieth century and have made major contributions towards the welfare of human society.

• Many antibiotics are produced by microorganisms, predominantly by *Actinomycetes* in the genus Streptomycin (e.g. **Tetracycline, Streptomycin, Actinomycin D**) and by filamentous fungi (e.g. **Penicillin, Cephalosporin**).

Organic acids

• Microbes are also used for the commercial and industrial production of certain organic acids. These compounds can be produced directly from glucose (e.g. **gluconic acid**) or formed as end products from pyruvate or ethanol.

• Examples of acids producers are *Aspergillus Niger* (**a fungus**) of Citric acid, *Acetobacter acute* (**a bacterium)** of acetic acid, *Lactobacillus* (**a bacterium)** of lactic acid and many others.

Enzymes

• Many microbes synthesise and excrete large quantities of enzymes into the surrounding medium. Using this feature of these tiny organisms, many enzymes have been produced commercially.

These include **Amylase, Cellulase, Protease, Lipase, Pectinase, Streptokinase** and many others.

• Enzymes are extensively used in **food processing and preservation, washing powders, Leather Industry, Paper Industry** and in scientific research

Vitamins

• **Vitamins** are some organic compounds which are capable of performing many lifesustaining functions inside our body.

• These compounds cannot be synthesised by humans, and therefore, they have to be supplied in small amounts in the diet.

• Microbes are capable of synthesizing these compounds and hence they can be used for the commercial production of many of the Vitamins e.g. **thiamine (Vitamin B_1), riboflavin (Vitamin B_2)**

Biofuels

• Organic solvents such as **ethanol, acetone, butanol** and **glycerol**are some very important chemicals that are widely used in petrochemical industries

These chemicals can be commercially produced by using microbes and low-cost raw materials (e.g. **wood, cellulose, starch**).

Steroids

• **Steroids** are a very important group of chemicals, which are used as anti-inflammatory drugs, and as hormones such as ***estrogens*** and ***progesterone***, which are used in oral contraceptives.

• Producing steroids from animal sources or chemically systhesising them is difficult, but microorganisms can synthesise steroids from **sterols** or from related compounds.

Vaccines

• **Vaccines** are a product of **Industrial Microbiology**. Many antiviral vaccines are massproduced in chicken eggs or cell cultures.

• The production of vaccines against bacterial diseases usually requires the growth of large amounts of the bacteria. **Recombinant DNA technology** is increasingly important in the development and production of subunit vaccines.

Pharmaceutical Drugs

• Many pharmaceutical drugs are also produced by microbes e.g. **Cyclosporin A**, that is used as an immunosuppressive agent in organ-transplant patients, is produced by the fungus *Trichoderma polysporum*.

• **Statins** produced by the yeast *Monascus purpureus* have been commercialised as bloodcholesterol-lowering agents. It acts by competitively inhibiting the enzyme responsible for the synthesis of **cholesterol**.