Year - April 2024

TYBSC-

Biotech

SEM - VI

No of pages - 22

(1)

TYBSc - Biotech. - Sem VI

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculators** is **allowed**.

Q.1 a. Select the correct alternative: (Any Six) **06**

1. The pasteurization equipment is designed in such a way that every particle of milk or milk products is _____ at a specific temperature and time duration.
   a) Heated
   b) Agitated
   c) Mixed
   d) Cooled
2. Milk secreted from the udders of cows has a pH around _____.
   a) 2.7
   b) 4.8
   c) 6.8
   d) 10.1
3. Which of the following pathogenic microorganisms is responsible for putrefaction of milk turning it as ropy or slimy?
   a) Streptococcus cremoris
   b) Serratia marcescens
   c) Pseudomonas syncyanea
   d) Alcaligenes viscolactis
4. The presence of *Clostridium* species in fresh milk indicates _____.
   a) Freshness of milk
   b) Staleness of milk
   c) Pasteurization of milk
   d) Excessive contamination with soil or dung
5. Which of the following is one of the disadvantages of the direct count method?
   a) It is simple and less time consuming
   b) Different morphological types may be distinguished
   c) It can not be applied to pasteurized milk
   d) Slides can be kept for permanent record
6. The milk may be preserved in refrigeration and pasteurization for a limited time, as well as by _____ for a longer shelf life.
   a) Hydration
   b) Addition of preservatives
   c) Low humidity
   d) Dehydration

X51Y070680X51Y070680X51Y070680X51Y070680

7. _____ and *Streptococcus lactis* are used as a starter culture in Cheddar cheese production.
   a) *Lactobacillus bulgaricus*
   b) *Propionibacterium shermanii*
   c) *Streptococcus thermophilus*
   d) *Streptococcus cremoris*

8. _____ produces hydrogen sulphide gas in negligible amounts which makes the cheese flavourful.
   a) *Lactobacillus casei*
   b) *Escherichia coli*
   c) *Saccharomyces cerevisiae*
   d) *Penicillium roqueforti*

9. _____ can be used as a sweetener in yogurt production.
   a) Gelatin
   b) Carboxymethyl cellulose
   c) Corn sweeteners
   d) Guar gum

Q.1 b. Answer the following questions: (Any Two) **14**

1. Describe the factors affecting bacteriological quality of milk.
2. Explain the manufacturing process of butter.
3. Elaborate on fundamental steps involved in cheese manufacturing.

Q.2 a. Select the correct alternative: (Any Six) **06**

1. The materials made surface active and collected are termed _____.
   a) colligends
   b) collectors
   c) surfactants
   d) filter aids

2. _____ is an example of non-ionic polymer.
   a) Proteins
   b) Cellulose
   c) Polyethylene glycol
   d) Surfactant

3. _____ is an example of flocculating agents.
   a) Alum
   b) Sodium lauryl sulphate
   c) Kieselguhr
   d) Sodium dodecyl sulphate

X51Y070680X51Y070680X51Y070680X51Y070680

(3)

4. _____ is a centrifuge for a slurry up to 5% solids of particle size 0.1 to 200 µm diameter.
   a) Tubular bowl
   b) Multi Chamber
   c) Basket
   d) Decanter

5. Lyophilization is also called as _____.
   a) Storage under liquid nitrogen
   b) Cryopreservation
   c) Freeze drying
   d) Spray drying

6. Anionic ion exchange resins normally contain a _____ active group..
   a) sulphonic acid
   b) phosphonic acid
   c) carboxylic acid
   d) secondary amine

7. _____ chromatographic method utilizes a solid phase (e.g. silica) which is modified to replace hydrophilic groups with hydrophobic alkyl chains.
   a) Ion exchange
   b) Affinity
   c) Reverse phase
   d) Gel permeation

8. _____ chromatography involves binding of the solute to the solid phase primarily by weak Van der Waals forces.
   a) Affinity
   b) Adsorption
   c) Gel permeation
   d) Ion exchange

9. _____ filter consists of a rotating, hollow, segmented drum covered with a fabric or metal filter which is partially immersed in a trough containing the broth to be filtered.
   a) Cross-flow
   b) Plate and frame
   c) Pressure leaf
   d) Rotary vacuum

Q.2 b. Answer the following questions: (Any Two) **14**

1. Discuss -Continuous filtration methods used in downstream processing.
2. Describe the different steps in downstream processing.
3. Elaborate on the role of affinity and gel permeation chromatography in the recovery and purification of the product.

X51Y070680X51Y070680X51Y070680X51Y070680

Q.3 a. Select the correct alternative: (Any Six) 06

1. _____ is the situation where laboratory or pilot scale experiments are conducted under conditions that mimic the industrial scale conditions.
   a) scale-up
   b) scale-down
   c) production scale
   d) troubleshooting

2. One of the features possessed by a strain of yeast used for alcohol fermentation
   a) high tolerance to alcohol
   b) variable biochemical properties
   c) slow growing
   d) less tolerant to osmotic pressure

3. The pH of streptomycin fermentation medium rises to about 8 in the first phase due to production of _____.
   a) ammonia
   b) acetic acid
   c) citric acid
   d) dil HCl

4. _____is used as a precursor for penicillin G.
   a) Phenyl acetic acid,
   b) Phenoxy acetic acid,
   c) Phenoxy amino acid,
   d) Phenyl alcohol

5. Short method of button mushroom compost preparation requires_____ days.
   a) 14-18 days
   b) 8-10 days
   c) 2-6 days
   d) 20-35 days

6. Which chromatographic technique is used to recover L-Lysine from fermentation broth?
   a) Adsorption chromatography
   b) Ion-exchange chromatography
   c) Gel-permeation chromatography
   d) Affinity chromatography

7. _____ process utilizing Corynebacterium glutamicum is mainly adopted to produce L-glutamic acid on a large scale.
   a) one-stage process
   b) two-stage process
   c) multi-stage process
   d) three-stage process

X51Y070680X51Y070680X51Y070680X51Y070680

(5)

8. _____ is an example of semisynthetic penicillin.
   a) Ampicillin
   b) Tetracycline
   c) Polymyxin
   d) Streptomycin

9. _____ are used as inoculum for fungal fermentations.
   a) cells
   b) Spores
   c) Mycelium
   d) biomass

Q.3 b. Attempt the following: (Any Two) **14**

1. Write a detailed flow sheet with significance in the commercial production process of penicillin along with the bio parameters to be controlled.
2. What are the general principles of inoculum development? Explain the procedure of inoculum development of bacteria.
3. Explain the production of alcohol considering strain employed and raw materials for production.

Q.4 a. Do as directed: (Any Six) **06**

1. Define: Pyrogen
2. Perquisites of a manufacturing process are listed. Find the incorrect one:
   a. clean air
   b. production in an open system to reduce cost
   c. production in a closed system
   d. dust-free environment
3. Raw materials of _____ origin, require careful storage to prevent growth of the organisms and spoilage of the material
   a) Inorganic
   b) Mineral
   c) Natural
   d) Metal
4. Test for _____ involves taking samples at random and testing for presence of microorganisms.
   a) Potency
   b) Efficiency
   c) Sterility
   d) Pathogenicity
5. _____ should be used at junctions between walls and floors or ceilings.
   a) Windows
   b) Vents
   c) Coving
   d) Pipes

X51Y070680X51Y070680X51Y070680X51Y070680

6. Name any one detergent used for disinfecting skin before entering an aseptic area.
7. _____ cycle includes the acquisition of all raw materials, their processing into a final product, and subsequent packaging and distribution.

   a) Quality assurance
   b) Quality control
   c) Manufacturing
   d) Packaging

8. Regular microbiological monitoring should be carried out to determine the efficacy of _____ procedures.
   a) disinfection
   b) Sterilization
   c) Manufacturing
   d) Fabrication
9. State whether the statement is true or false. "The term quality is usually taken to mean fitness for purpose".

Q.4 b. Give an account of the following questions: (Any Two) **14**

1. Environmental grades and manufacturing operations.
2. Environmental cleanliness and Quality of starting materials are important factors affecting the manufacture of sterile products.
3. Requirements of sterile products manufacturing unit.

Q.5 Write Short notes on the following: (Any Four) **20**

a. Normal flora of milk

b. Sundae style yogurt

c. Recovery of citric acid

d. Nutritional value of Mushroom

e. Hazard Analysis critical control point

f. Aspects of Quality assurance

X51Y070680X51Y070680X51Y070680X51Y070680

(7)

TYBSC - Biotechnology - sem VI

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labelled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

Q.1 a. Select the correct alternative: (Any Six) **06**

1. Biodiesel originates from _____.
   a) petroleum b) natural gas c) biomass d) coal)
2. Biogas primarily consists of _____.
   a) Oxygen b) Nitrogen c) Carbon dioxide d) Methane)
3. Biogas is generated through the decomposition of organic matter in the absence of _____.
   a) oxygen b) carbon dioxide c) sunlight d) water)
4. Biomass energy is obtained from _____.
   a) Burning coal b) Burning wood c) Burning oil d) Burning natural gas)
5. Ethanol is chiefly derived from _____.
   a) Corn b) Wheat c) Soybeans d) Rice)
6. Geothermal energy harnesses heat from the _____ to produce power.
   a) Sun b) Wind c) Earth d) Water)
7. Hydropower exemplifies _____ energy.
   a) Renewable b) Non-renewable c) Nuclear d) Fossil fuel)
8. Microbial hydrogen production involves utilizing _____.
   a) Bacteria b) Fungi c) Viruses d) Algae)
9. Wind turbines transform _____ into _____.
   a) Heat, Light b) Light, Heat c) Wind, Electricity d) Water, Oxygen)

Q.1 b. Answer the following questions: (Any Two) **14**

1. Detail the Biogas production process and explore its potential applications.
2. Compare and contrast the benefits of renewable energy sources with conventional ones.
3. Elaborate on the biological mechanism behind hydrogen production.

Q.2 a. Do as directed: (Any Six) **06**

1. The semaphore crab has been shown to be a good indicator of _____ in Australian estuaries. (Lead, mercury, copper, arsenic)
2. Give any one example of biodegradable waste.
3. State true or false: TNT is a xenobiotic compound.
4. Give any one example of support medium used in fluidised bed reactor.
5. Name any aerobic wastewater treatment system which utilises fixed film process.

X51Y45B15FX51Y45B15FX51Y45B15FX51Y45B15F

6. Name the market gene from the jellyfish *Aequorea victoria* which can be used as a genetic indicator for monitoring of pollution
7. Name any one method of immobilization of biocatalyst.
8. Give any one example of an organism which can decolorize Kraft lignins.
9. Name any one enzyme involved in biodegradation of xenobiotic compounds by bacteria.

Q.2 b. Answer the following questions: (Any Two) 14

1. Give a brief account on Activated sludge process.
2. Describe various methods of treatment and disposal of non- hazardous solid wastes.
3. Elaborate on the role of bioindicators in pollution monitoring with suitable examples.

Q.3 a. Select the correct alternative: (Any Six) 06

1 Simplicity, stable nature and mostly—— organics in sewage make microbiology and biochemistry study of sewage treatment relatively straightforward.
   a) digestible b) developing
   c) destroyable d) deleting

2 Metal processing mine wastes are mainly rich in ——— material
   a) organic b) inorganic
   c) stable d) microbial

3 In ——— culture, cometabolism can be considered as a dead end transformation without benefit to that microorganism.
   a) impure b) pure
   c) degraded d) metabolic

4 Agricultural and food industry wastes are rich in ——matter.
   a) inorganic b) organic
   c) stable d) heavy metals

5 The extra chromosomal ———- materials are called plasmids.
   a) DNA b) RNA
   c) protein d) carbohydrate

6 Packaged organisms reduce———————- phase.
   a) lag b) log
   c) stationary d) death

7 ——— is the most common coagulant in wastewater treatment.
   a) Alum b) Ferric sulphate
   c) Limestone d) Coal

8 Bioaugmentation involves————————.
   a) elimination of sludge b) plant usage for bioremediation
   c) addition of microbes to a clean-up site. d) Bioventing.

X51Y45B15FX51Y45B15FX51Y45B15FX51Y45B15F

9 ———— algae is used in biosorption of Uranium from seawater.

a) *Sargassum natan* b) *Fucus vesiculosus*

c) *Halimeda opuntia* d) *Chlorella vulgaris*

Q.3 b. Discuss the following: (Any Two) **14**

1. Role of fungi in biosorption with examples.
2. Impact of pollutants on bio treatment.
3. Sources of heavy metal pollution and toxicological properties of heavy metals.

Q.4 a. Select the correct alternative: (Any Six) **06**

1 Distillery effluents contain a dark brown pigment called——-.

a) Melanoidin b) Azurite

c) Quinacridone d) Kaolinite

2 Which of the following metals is present in spent wash?

a) Fe b) Al

c) Mg d) Li

3 Stone ground pulping is an example of — pulping process.

a) mechanical b) chemical

c) biochemical d) thermal

4 The first ligninolytic peroxidase was isolated from——.

a) *P. chrysosporium* b) *B. adusta*

c) *C. bulleri* d) *H. larincinus*

5 In tannery effluent, —— together with—- are of major concern.

a) Cr, pentachlorophenol b) Fe, trichloroethylene

c) Ni, sulphuric acid d) Al,methyl acetate

6 Which of the following organisms is useful in degrading naphthalene in petroleum wastes?

a) *Desulfobacterium cetonicum* b) *Blastochloris sulfoviridis*

c) *Azoarcus tolulyticus* d) *Thauera aromatica*

7 Which statement best describes the wastewater due to the fermentation process in the Antibiotic industry?

a) Low levels of BOD, COD and TSS, pH of 6 to 8

b) High levels of BOD, COD and TSS, pH of 4 to 8

c) Low levels of BOD, COD and TSS, pH of 2 to 4

d) High levels of BOD, COD and TSS, pH of 2 to 4

8 —— is the main carbohydrate in dairy wastewater.

a) Galactose b) Lactose

c) Maltose d) Sucrose

9 Polishing pond helps to reduce TSS and ——

a) BOD b) COD

c) pH d) Temperature

X51Y45B15FX51Y45B15FX51Y45B15FX51Y45B15F

Q.4 b. Answer the following questions: (Any Two)

1. Discuss the secondary treatment for waste water from the pulp and paper industry. 14
2. Elaborate on biological treatment of antibiotic industry waste water.
3. Give an account of the impact of petroleum waste on the environment.

Q.5 Write Short notes on the following: (Any Four) 20

a. Ethanol as biofuels.

b. Biosensors

c. Biostimulation and bioaugmentation

d. Packaged microorganisms

e. Characteristics of distillery wastewater

f. Tertiary treatment for dairy wastewater

X51Y45B15FX51Y45B15FX51Y45B15FX51Y45B15F

(11)

TYBSC.- Biotech - SemVI

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculators** is **allowed**.

Q.1 a. Select the correct alternative: (Any Six) **06**

1. Name the enzyme which catalyzes the synthesis of the second messenger cAMP.
   a. adenylyl cyclase b. adenylyl synthase
   c.adenylyl synthetase d. guanylyl cyclase
2. The term used for the drug concentration which gives lethal effects in half the number of subjects in a study population is_____.
   a. LD_{50} b. ED_{50}
   c. PD_{50} d. LD_{99}
3. The resting potential of a postsynaptic membrane is _____
   a. -80mV b. -70mV
   c. -75mV d. -85mV
4. The dose-response curve in which the effect of the drug is all or none is called _____
   a. graded response curve b. quantal response curve
   c.both d. neither
5. _____ is the feature of a drug that depends on affinity and efficacy
   a. intrinsic activity b. potency
   c. lethality d. protectivity
6. Which of the following would correctly measure the 'protective index'?
   a. ratio of LD50 / ED50
   b. ratio of ED50 / LD50
   c. ratio of ED50 (undesirable side effects)/ ED50(desirable effect)
   d. ratio of ED50 (desirable effect)/ ED50(undesirable side effects)
7. Which natural agonist binds to the nicotinic receptor on the skeletal muscle fiber ?
   a.acetylcholine b. dopamine c. morphine d. 5 HT
8. Nicotinic ACh receptors involve the movement of which ions across the membrane?
   a. Mg b. Fe
   c. K d. Ca
9. A drug that has the same effect on a receptor as the endogenous chemical messenger is known as_____
   a.agonist b. antagonist
   c. partial agonist d. inhibitor

X51YED7BBFX51YED7BBFX51YED7BBFX51YED7BBF

Q.1 b. **Answer the following questions: (Any Two)** **14**

1. Explain competitive and non – competitive antagonism.
2. Describe the second messenger system and G proteins.
3. Define therapeutic index and protective index. How will you calculate the therapeutic index?

Q.2 a. **Select the correct alternative: (Any Six)** **06**

1. The rate at which a drug reaches its site of action depends on absorption and _____.
   a.Distribution b.Metabolism
   c. Excretion d.Storage
2. The smaller the fraction of the total drug molecules ionized, the _____the electrolyte.
   a. Stronger b.Larger
   c. Weaker c.Smaller
3. The time of onset of drug action after its administration is known as _____.
   a.Partition coefficient b. Active Diffusion
   c. Latent period d.Bulk flow
4. The driving force for facilitated transport is the _____.
   a.Neutral ion pair complex b.Intercellular pores
   c. Concentration gradient
   d.Coadministration of other compounds
5. The epithelial lining of the small intestine is composed of a single layer of cells called _____.
   a.Monocytes b.Enterocytes
   c. Oocytes d. Alveoli
6. Which of the following is a pharmacological factor influences the increase in the gastric emptying rate?
   a.Narcotic analgesics b.Labour of childbirth
   c.Guanethidine d.Gastric distention
7. Rectal dosage forms include solutions and _____.
   a.Tablets b.Solids
   c.Suppositories d.Lipids
8. _____ forms a barrier against the rapid penetration of most drugs through the skin.
   a.Stratum corneum b.Stratum lucidum
   c.Stratum spinosum d. Stratum basale

X51YED7BBFX51YED7BBFX51YED7BBFX51YED7BBF

(13)

9. Several drugs like Chlorpromazine have an affinity for the retinal pigment _____ and thus may accumulate in the eye.
a.Chlorophyll b.Xanthophyll
c.Melanin d.Metallothionein

Q.2 b. Answer the following questions: (Any Two) **14**

1. Describe how the drugs are absorbed in the stomach and small intestine from the alimentary canal.
2. Explain a role of metabolism and Efflux transporters as factors affecting rate of gastrointestinal absorption.
3. Elaborate on selective accumulation of drugs in body tissues.

Q.3 a. Select the correct alternative: (Any Six) **06**

1. Allergies can best be described as
a.Sneezing, itching, watery eyes, scratchy throat
b.An overreaction from the immune system to a foreign substance
c.The onset of a cold during spring months
d.A reaction to the influenza virus during spring months

2. Which one of the following agents or factors causes malformation of an embryo?
a.Teratogen b.lipids
c. protein d. heptain

3. _____ implies an inherent qualitative abnormal reaction to a drug, usually due to genetic abnormality.
a.Primary effects b.Intolerance
c. Idiosyncrasy d. secondary effects

4. State the effects of Psychotropic drugs.
a.Effect on behavior, mood, thoughts , perceptions.
b. painkiller effect c.wound healer effect
d. antibiotics

5. Give the name of any one chelating agent used in cases of poisoning by arsenic.
a.hemoglobin b.heme group
c.heme protein d.Dimercaprol

6. The ability of a drug to damage cells at high drug dose is called as ___.
a.good-effects b.Toxicity
c.harmless-effects d.Allergies

X51YED7BBFX51YED7BBFX51YED7BBFX51YED7BBF

7. The process in which activated charcoal binds to, and thus inactivates, a wide variety of compounds in the gut is called as _____.
   a gut poisoning
   b.gut contamination
   c gut decontamination
   d.gut infection

8. Long term pesticide exposure has been linked to the development of Parkinson's disease. **(True/ False)**

9. Which of the following is not a sign of heavy metal poisoning?
   a. Abdominal pain
   b. Cardiomyopathy
   c. Numbness
   d. Farsightedness

Q.3 b. Discuss the following: (Any Two) **14**

1. The term overdose of medicinal drugs. Elaborate on its adverse effects on reproduction.

2. Specific poisoning. Add note on hydrocarbons and heavy metals Poisoning.

3. The principles of clinical manifestation of allergic reactions.

Q.4 a. Select the correct alternative: (Any Six) **06**

1. The two cerebral hemispheres are connected by the _____
   a. Cerebral cortex
   b. Blood brain barrier
   c. corpus callosum
   d. medulla oblongata

2. Increased intake of the Na+ ions in the neuron causes _____.
   a. Depolarization
   b. Polarization
   c. Deactivation
   d. Inhibition

3. Immediately after the Na+ pores open as a result of membrane depolarization; it causes the opening of _____ ion channels.
   a. Ca+
   b. K+
   c. Cl-
   d. Zn+

4. _____is an integral membrane protein, involved in synaptic vesicle cycle.
   a. Syntaxin
   b. Connexins
   c. G proteins
   d. Po

X51YED7BBFX51YED7BBFX51YED7BBFX51YED7BBF

(15)

5. _____ is one of the steps involved in synaptic vesicle cycle for the release of the neurotransmitters in synapse.
   a. Deactivation of the vesicles
   b. Docking of the vesicles on the membrane of the synaptic knob
   c. Locking of the vesicles on the membrane of the synaptic knob
   d. Removal of the vesicles from the synaptic knob

6. Cholinergic receptors are activated by the binding of _____.
   a. Atropine b. Acetylcholine.
   c. Glycine d.Decamethonium

7. _____ toxins block the Na+ ion channels.
   a. Scorpion b. black widow spider
   c. Saxitoxin d. Cro

8. Accumulation of _____ causes the brain to rest.
   a. Serotonin b. Adrenaline
   c. L-DOPA d. Acetylcholine

9. _____ proteins make up Gap junctions.
   a. Connexins b. Adhesins
   c. Plasmodesmata d.Basal laminae

Q.4 b. Give an account of the following questions: (Any Two) **14**

1. Structure, working and function of K+ ion channels.
2. Synaptic vesicle cycle.
3. Catecholamines as neurotransmitters.

Q.5 Write Short notes on the following: (Any Four) **20**

a. Quantal dose response.

b. Any two physiological barriers to drug distribution

c. Insecticides poisoning

d. Incapacitated Agents

e. Synapse

f. Cerebellum

_____

X51YED7BBFX51YED7BBFX51YED7BBFX51YED7BBF

20DG24M05

Agribiotech TYBSc Sem VI

Q.P. Code:
3 Hours
Total Marks: 100

1. **Attempt all questions.**
2. **All questions carry equal marks.**
3. **Draw neat labeled diagrams wherever necessary.**

Q.1 a) Answer the following in one sentence: (Any six) **06**

1 The minimum limit of relative humidity for normal physiological functioning of plants is _____%.
2 Define- fertigation.
3 Name any two types of green houses.
4 Give the full form of SSNM.
5 State any one difference between low pressure mist system and high pressure mist system.
6 State true or false:
A green house should be oriented east-west.
7 What is phytotron?
8 At relatively high sunlight intensities and temperature, the photosynthetic rate is directly proportional to _____ concentration up to 2400 ppm.
9 Give the disadvantages of fiber reinforced panels.

Q.1 b) Answer the following questions: (Any two) **14**

1 Describe the agro-climatic factors important for greenhouse management.
2 Elaborate on the types of glazing materials.
3 Explain in detail the benefits of rooftop farming.

Q.2 a) Answer the following in one sentence: (Any Six) **06**

1 What is plant stress?
2 Write the full form of HSPs.
3 What are R genes?
4 Give any one difference between biotic and abiotic stress.
5 State true or false:
Biotic interactions always have a negative effect on plants.
6 What is the significance of ubiquitination.
7 Give examples of chilling sensitive plants.
8 What is the meaning sodicity?
9 Define- photoinhibition.

Q.2 b) Answer the following questions: (Any two) **14**

1 'Too much light inhibits photosynthesis', justify.
2 Elaborate on the plant pathogen interactions.
3 What is water stress? Discuss the effects of water stress on plants.

Q.3 a) Answer the following in one sentence: (Any six) **06**

1 Define- marker.
2 Give the full form of SNP.
3 State true or false:
SSRs are present in the genome of all eukaryotes.
4 Give the significance of restriction enzymes.

(17)

5 What is the role of mat K?
6 Name the dye used for visualization of DNA in electrophoresis.
7 Give the advantages of AFLP.
8 Enlist any two DNA barcoding organizations.
9 Which enzyme is used for the polymerization of DNA in PCR technique?

Q.3 b) Answer the following questions: (Any two)
1 Elaborate on QTL mapping.
2 Discuss in detail the process of RFLP analysis. 14
3 Describe the types of markers used in plant breeding.

Q.4 a) Answer the following in one sentence: (Any six)
1 Write long form of CRYEMA.
2 Enlist the examples of carries used for biofertilizer preparation. 06
3 Define- mycobeads.
4 Enlist the names of toxins produced by *B. thuringiensis.*
5 Give examples of non symbiotic nitrogen fixers.
6 What are viral pesticides?
7 Give the role of cytokinins.
8 Define- phytohormones.
9 Give the applications of biofertilizers.

Q.4 b) Answer the following questions: (Any two)
1 Give an account on the mass cultivation of *Rhizobium* and its uses as biofertilizer. 14
2 Elaborate on microbial pesticides.
3 Describe in detail use of mycorrhizal fungi as biofertilizer.

Q.5 Write short notes on the following: (Any four)
a Cooling systems 20
b Need of precision farming
c Plant resistance mechanisms
d Microsatellites
e DNA barcoding
f Phosphate solubilizing microbes

****

(17)

TYBSC - Biotech - Sem VI

3 Hours

Total Marks: 100

1. **Attempt all questions.**
2. **All questions carry equal marks.**
3. **Draw neat labeled diagrams wherever necessary.**
4. **Use of log tables and non-programmable calculator is allowed.**

Q.1 a. Answer the following : (Any six) **06**

1. What is signal transduction ?
2. Which of the terms is used for the ratio of LD50/ ED50?
3. Give one example of functional antagonism
4. What are receptors ?
5. What are GPRS
6. Define efficacy of a drug
7. What is a partial agonist ?
8. Anticonvulsants can be suitably studied by use of which type of dose–response curves ?
9. What is chemical antagonism ?

Q.1 b. Answer the following questions: (Any Two) **14**

1. Explain giving suitable example second messenger systems
2. Explain giving suitable examples types of competitive antagonism
3. Explain giving suitable example the construction of a graded dose response curve

Q.2 a. Do as instructed: [MCQ] (Any six) **06**

1. Rectum can be used as a site of drug administration, when
   a. drugs can cause gastric irritation
   b. after gastrointestinal surgery
   c. both
   d. neither
2. An example of drug metabolizing enzyme
   a.cytochrome p550 enzyme
   b. ytochrome p450 enzyme
   c.cytochrome p650 enzyme
   d.cytochrome p350 enzyme
3. Monitoring the effects of drugs after they have been licensed for use and to report adverse reactions is known as
   a.pharmacoepidemiology
   b.pharmacovigilance
   c.Pharmacognosy
   d.Pharmacology

b. Pressure gradient as a driving force for passage of drug through the membrane
a. Filtration b. bulk flow c. passive diffusion d. facilitated diffusion

BC327106A61A3B85E1439DEDE3F87AF8

c. The pH at which the ionized and unionized forms of the drug exist in equal concentrations of a drug is known as
a. pKa b. pHa c. pKm d. pKc

d. The kidneys contain a protein which has high affinity for metals, the protein is
a. Metallocarboxynein b. metallohydroxynein
c. metallosulphonein d. metallothionein

e. Tetracycline deposition in bones can cause
a. yellow-brown discolouration of teeth b. dysplasia
c. poor bone development d. all three

f. Cellular uptake of exogenous molecules inside plasma membrane derived vesicles
a. Phagocytosis b. endocytosis c. pinocytosis d. all three

g. The stratum corneum forms a barrier against the rapid penetration of most drugs. This is due to
a. closely packed cellular arrangement
b. increased amount of lipid in these cells
c. not closely packed cellular arrangement
d. all three

Q.2 b. Answer the following questions: (Any Two) 14

1. Explain any three mechanisms of solute transport across membranes.
2. Elaborate on absorption of drugs from oral cavity and sublingual absorption.
3. Describe the binding of drugs to plasma proteins.

Q.3 a. Do as directed: (Any Six) 06

1. Define the term: Intolerance.
2. Immune complex mediated type reactions are classified under _____ hypersensitivity.
3. Give one example of the misused drug which causes addiction addiction.
4. State true or false: Alteration in DNA structure or number causes nephropathy.
5. Name any one antidote used as a chelating agent to cure antimony poisoning.
6. What are two types of drug dependence?
7. Give one significance of hemodialysis.
8. Assign anyone an antidote for ethylene glycol poisoning.
9. Give one example of the extremely toxic herbicide.

(13)

Q.3 b. Answer the following: (Any Two) **14**

1. Explain in detail the different allergic responses shown by the host against Drugs.
2. What do you mean by Poisoning? Discuss in detail on different types of Poisoning with examples.
3. Discuss in detail the consequences of continuous intake of nicotine and Lysergic acid.

Q.4 a. Do as directed: (Any six) **06**

1. Fill in the blank: The resting membrane has a potential of about _____mV.
2. Give any one example of an ionotropic glutamate receptor.
3. Name the antagonist of glycine receptors.
4. Fill in the blank: Increase in the permeability of the sodium ions within the neurons leads to _____
5. Name the neurotoxin produced by puffer fish
6. Fill in the blank : The outermost leathery double layered membrane that surrounds the brain is called _____
7. Fill in the blank:_____ is neurotoxin as well cardiotoxin.
8. Fill in the blank: Dopamine,noradrenaline and adrenaline are metabolic products of _____ amino acid.
9. Name the system of the brain which is a mediator of mood.

Q.4 b. Answer the following questions: (Any Two) **14**

1. What are voltage gated ion channels? Explain sodium ion channel with its function.
2. Explain synaptic vesicle cycle
3. Write a note on Amino acids as neurotransmitters

Q.5 Write Short notes on the following (Any four) **20**

a. Protective index of a drug
b. Factors affecting drug distribution
c. Absorption of drugs through lungs.
d. Drug distribution across the blood brain barrier.
e. Drugs used in Criminal Investigation
f. Gap junctions

BC327106A61A3B85E1439DEDE3F87AF8

TY BSc - Biotech - sem VI

3 Hours | Total Marks: 100

1. **Attempt all questions.**
2. **All questions carry equal marks.**
3. **Draw neat labeled diagrams wherever necessary.**
4. **Use of log tables and non-programmable calculator is allowed.**

Q.1 a. Explain the following terms: (Any six) **06**

1. A biogas plant is used to produce _____.
   (a) Electricity b) Water c) Gasoline d) Oxygen)
2. Biodiesel is primarily produced from _____.
   (a) Soybeans b) Corn c) Sunflowers d) Palm oil)
3. Biofuels are made from _____.
   (a) Fossil fuels b) Renewable sources c) Nuclear energy d) Wind energy)
4. Biogas is composed mainly of _____.
   (a) carbon dioxide and nitrogen b) methane and carbon dioxide c) oxygen and nitrogen d) hydrogen and helium)
5. Hydropower generates electricity using the power of _____.
   (a) Wind b) Water c) Sun d) Geothermal energy)
6. Solar panels convert _____ into _____.
   (a) Heat, Light b) Light, Heat c) Wind, Electricity d) Water, Oxygen)
7. The main factors affecting biogas production are _____.
   (a) Temperature, pH, Nutrient level b) Temperature, Wind speed, Rainfall c) pH, Soil type, Nutrient level d) pH, Wind speed, Rainfall)
8. Which of the following is not a factor affecting biogas production?
   (a) temperature b) pH c) rainfall d) substrate type)
9. Wind turbines are typically installed in areas with _____.
   (a) high temperatures b) high humidity c) high altitude d) high wind speeds)

Q.1 b. Answer the following questions: (Any Two) **14**

1. What is the process of Biogas production and what are its possible applications?
2. Outline the advantages of renewable sources of energy in comparison to conventional sources of energy?
3. Explain the biological production process of hydrogen

Q.2 a. Do as instructed: (Any six) **06**

1. _____ is defined as the metabolism of an organic compound in the presence of a growth substrate.
   a. biomagnification b. anabolism c. detoxification d. co-metabolism
2. Which of the following aerobic wastewater treatment system utilises suspended growth process.
   a. Trickling filter b. Activated Sludge c.Rotating biological contactors
   d. Oxidation ponds
3. Which of the following is an example of closed tank system in Advanced Activated Sludge Processes
   a. PRIMOX b. UNOX c. VITOX d. MEGOX

41D9578A49ED0048714F6B3A09237585

4. _____ is an immobilised enzyme which can be used for the treatment of wastewater from wheat industry
   a. cellulase b.sucrase c. amylase d. diastase
5. _____ indicators are based on the ability of a pollutant to generate a response at the gene level inducing or increasing specific enzymes involved with detoxification of contaminants
   a. biochemical b. biophysical c. genetic d. immunochemical
6. Sequestration by _____ in bacteria is one of the mechanisms for detoxification of heavy metals
   a. phytochelatins b. metallothioneins c. glutathione d.ethoxyresofurin
7. _____ are a symbiotic relationship between alga and fungus
   a. Aphids b. Mussel c. Lichen d. Moss
8. The marker gene from prokaryotes which can be used as a genetic indicator for monitoring of pollution
   a. *gfp* b. *lux AB* c. *lac ZY* d. *mer*
9. _____ has been used as a bioindicator for the contamination of the atmosphere by heavy metals
   a. honey bees b. periphyton c. lichen d. moss

Q.2 b. Answer the following questions: (Any Two) **14**

1. Justify: Chemical properties of xenobiotic compounds influence their biodegradability.
2. Give a brief account on the Activated sludge process.
3. Elaborate on the role of bioindicators in pollution monitoring with suitable examples.

Q.3 a. Do as directed: (Any Six) **06**

Select the correct alternative -

1. _____ has the capacity to bind heavy metals by polysaccharides of microbial flocs.
   a) Activated sludge b) Adsorption c) Precipitation d) Cometabolism
2. Microorganisms will need a _____ and energy source to be active in wastewater treatment.
   a) Nitrogen b) Oxygen c) Potassium d) Carbon
3. Bioaugmentation involves _____.
   a) Eliminating sludge
   b) Bioventing
   c) Addition of microbes to clean up site
   d) Plants usage for bioremediation
4. The chemical behaviour of _____ mimics that of sodium and potassium which are readily absorbed by cells.
   a) ^{90}Sr b) ^{14}C c) ^{1}H d) ^{137}Cs
5. Carboxyl and _____ groups have been identified as the main metal - sequestering sites in seaweed.
   a) Phosphate b) Nitrate c) Carbonate d) Sulphate

State True or False -

6. Biological wastewater treatments perform best in a narrow pH range 6 to 10.
7. NADH is the major form of energy carrier and links dissimilatory and assimilatory processes.
8. Agricultural and food industry wastes are rich in organic matter.
9. Define Co-metabolism.

41D9578A49FD0048714F6B3A09237585

Q.3 b. **Answer the following: (Any Two)** 14

1. Elaborate on - Role of important micro - organisms in wastewater treatment.
2. Explain in detail - Use of algae in biosorption with suitable examples.
3. Describe about plasmid - borne metabolic activities.

Q.4 a. **Do as directed: (Any six)** 06

Select the correct alternative -

1. Decolorization is a result of two mechanisms such as _____ and ion exchange.
   a) Absorption b) Transmission c) Filtration d) Adsorption
2. _____ tanning is made with vegetable agents and is used for heavy cattle hides.
   a) Rapid b) Bark c) Chrome d) White
3. In solar energy method, the chemical oxygen demand (COD) of the effluent is reduced to_____ ppm.
   a) Less than 50 b) Greater than 250
   c) Less than 150 d) Greater than 150
4. In saccharification of the starch, the flour is mixed with water in the mash tub which has a capacity _____ L.
   a) 1.9 b) 2.9 c) 3.5 d) 2.5

State True or False -

5. Ochre is a dye obtained from an impure earthy ore of iron or ferruginous clay, usually red or yellow.
6. Chemical pulping mainly uses physical energy to separate fibres from raw material.

Answer the following -

7. Define - Staking.
8. Enlist any one alternative name of alum tanning.
9. Give any one example of chemical agents used to dissolve lignin and separate fibres.

Q.4 b. **Answer the following questions: (Any Two)** 14

1. Describe the biological treatment methods used for tannery effluents in detail.
2. Describe the physico - chemical characteristics of pulp and paper mill effluents.
3. Elaborate on - Physical methods used for the treatment of wastewater in the antibiotic industry.

Q.5 **Write Short notes on the following (Any four)** 20

a. Petrocrops.
b. UASB.
c. Biosensor- one example.
d. Limitations of biosorption.
e. Applications of immobilized cells and enzymes.
f. Removal of oil spillage and grease deposits.

41D9578A49FD0048714F6B3A09237585