M181023S05

SYBT BSC
18/10/23

Time - 2 ½ hours | Marks–75

Note: Attempt all questions.
All questions carry **equal** marks.
For Q.2,Q.3 and Q.4 attempt A and B OR C and D
Draw **neat labeled diagrams** wherever necessary.

Q.1 A) **Answer the following.(Any fifteen)** (15)

1. Define agitation.
2. Write any two advantages of serum removal from fermentation medium.
3. Define rheology.
4. Give any two examples of carbon sources used in fermentation media.
5. Which construction materials are used to construct fermenter body?
6. Enlist the types of antifoams.
7. Define filter sterilization.
8. Define on-line sensor.
9. Enlist the three main classes of sensors.
10. Name the bulb present in electrical resistance thermometers.
11. What is seed culture?
12. Give an application of gas analysers in flow control.
13. Define skimming.
14. Give any two examples of electrodes used in pH measurement.
15. Full form of DFP is----------.
16. Give any one example of amylase producing bacteria.
17. What is exopeptides?
18. Define auxotroph.
19. Give one advantage of batch fermentation.
20. Write application of citric acid in bakery industry.

Q.2 A) Explain the structure and function of tower fermenter. (08)
Q.2 B) Elaborate on the concept of inoculum and production medium in fermentation. (07)

OR

Q.2 C) Describe the factors affecting choice of nitrogen sources. (08)
Q.2 D) Explain the process of air supply and exhaust gas sterilization in fermenters. (07)

Q.3 A) Explain in detail foaming control and measurement in fermentation process. (08)
Q.3 B) Elaborate the scale-down of batch sterilization processes. (07)

OR

Q.3 C) Describe the fungal inoculum development in detail. (08)
Q.3 D) Discuss the instruments used for pressure measurement in fermentation. (07)

Q.4 A) Explain the role of microorganisms in streptomycin production. (08)
Q.4 B) Describe the significance and application of aerobic and anaerobic fermentation. (07)

OR

Q.4 C) Elaborate the steps involved in glutamic acid production. (08)
Q.4 D) Explain in detail the amylase production from microorganisms. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Antifoams
b. Filter sterilization
c. Thermal mass flowmeter
d. Thermistor
e. Submerged fermentation

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S4B.T
19/10/23

M191023514

Note: Attempt all questions. Marks–75
All questions carry equal marks.
For Q.2.Q.3 and Q.4 attempt A and B OR C and D
Draw neat labeled diagrams wherever necessary.

Q.1 A) **Do as directed. (Any fifteen)** (15)

1. Define normal microbiota.
2. If many people in a given area acquire a certain disease in a relatively short period, it is called ----------.
3. The Vitamin K and Vitamin B is synthesized by E. coli.(State true or false)
4. The Mechanical transmission carried out through the ----------.
5. Define septicemia.
6. What is the carriers?
7. Define analytical epidemiology.
8. What is the liquefaction?
9. Define tubercle.
10. The Pneumococcal pneumonia involves in both --------and ----------.
11. Write the name of immune cell in which *Mycobacterium tuberculosis* is invade.
12. Give the name of differential media used for isolation of *E.coli*.
13. The bacteria *S.aureus* produces -------toxin.
14. Write the name of tests used in lab diagnosis of tuberculosis.
15. What is the causative agent of bacillary dysentery?
16. ----------is the bluish green phenazine pigment produced by *P.aeruginosa*.
17. Define Ophthalmic neonatorum.
18. Uncomplicated shigellosis is a self limiting condition in which the patient usually recovers spontaneously in a few days.(State True or false)
19. In the primary stage of Syphilis the initial sign is a small, hard based ----------or sore that appears at the sign of infection.
20. Write the name of bacteria used in TAB vaccine.

Q.2	A)	Explain the pattern of infections.	(08)
Q.2	B)	Describe the spread of infection by vectors.	(07)
		OR	
Q.2	C)	Discuss in brief Opportunistic Pathogen.	(08)
Q.2	D)	Explain the experiments used for identification of specific causative agent of specific disease.	(07)
Q.3	A)	Describe the Urinary Tract Infections.	(08)
Q.3	B)	Give an account on transmission of infection caused by *S.pneumoniae*.	(07)
		OR	
Q.3	C)	Compare between the ETEC and EPEC.	(08)
Q.3	D)	Describe the stages of tuberculosis disease development.	(07)
Q.4	A)	Give an account on the epidemiology of *Shigella*.	(08)
Q.4	B)	Explainthe classification of *Salmonella spp.*	(07)
		OR	
Q.4	C)	Describe the tertiary stage of Syphilis.	(08)
Q.4	D)	Explain the diagnosis and treatment of Gonorrhea	(07)

Q.5 **Write short notes on any three of the following.** (15)

a. Exceptions of Koch postulates

b. Enteric fever as a clinical syndrome

c. Pathogenicity of *Pseudomonas*.

d. Host parasite relationship

e. Enlist characteristics of *E.coli*

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M201023524

SYB.T
20/10/23

[illegible]
[illegible] Q.2 [illegible]
[illegible] heat labeled diagrams [illegible]
calculator [illegible]

A) Attempt any [illegible] of the following:

1. Define [illegible]
2. A centriole contains ---------- complete microtubule.
3. What is the function of cytoskeleton?
4. What is the role of cilia and flagella in microtubules?
5. Microtubules of a dividing cell form the mitotic spindle. (State True/False)
6. What is MAPs?
7. Define axonal transport.
8. Give the role of microvilli.
9. What is gap junction?
10. Give the role of scramblase.
11. What is ATP driven pump?
12. Define Arrestin.
13. Give any two types cell membrane.
14. What is trisomy 13?
15. Duplication is a process in which there is generation of another similar copy of chromosome. (state True/false)
16. What is the formula of recombinant frequency?
17. What is mean by pedigree analysis?
18. Give an example of back cross.
19. Define heterochromatin.
20. Define bar bodies.

Q.2 A) What is cytoskeleton? Give an overview of its function. (08)

Q.2 B) Discuss in detail of microfilament assembly and disassembly. (07)

OR

Q.2 C) Give an account dynamic properties of microtubules. (08)

Q.2 D) Explain the structure and role of sarcomere in organization of muscle. (07)

Q.3 A) Explain in detail types of transporters in cell-cell interactions. (08)

Q.3 B) Elaborate on the fluid mosaic model. (07)

OR

Q.3 C) Describe in detail the structure of chromosome in Euchromatin. (08)

Q.4 A) Explain with an [illegible] determination (08)

Q.4 B) Explain [illegible] (07)

OR

Q.4 C) Explain pedigree analysis with their suitable example. (08)

Q.4 D) Describe in detail of Trisomy 21 & Trisomy 18. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. MTOCs
b. Na+and k+pump.
c. Polythene chromosome
d. Cri-du-Chat
e. Tight junction.

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SYBSC B.T
20/10/23

M201023S23

Time: 2 hours | Marks-75

Note: Attempt all questions.
All questions carry equal marks.
For Q.2, Q.3 and Q.4 attempt A and B OR C and D

Q.1 A) **Attempt any fifteen of the following.** (15)

1. Give biological role of catalase.
2. What is apoenzyme?
3. Enlist essential elements in biological system.
4. State true or false.
   Deficiency of iodine element causes goitre disease.
5. Give any two names of classes of enzymes.
6. Define substitution reaction.
7. Fill in the blank.
   The oxygen dissociation curve for haemoglobin is -------- in shape.
8. Give an application of centrifugation.
9. What is the fixed angle of rotors in centrifuge?
10. Name the main components of a centrifuge.
11. State true or false.
    Activation of polysaccharide involves treatment with cyanogen bromide at P^H 11.0 in affinity chromatography.
12. Give application of spacer arm.
13. Fill in the blank.
    In gel permeation chromatography the volume of solvent surrounding the gel beads is called as ----------.
14. Enlist an example of cation exchanger.
15. Give the types of electrophoresis.
16. What is the role of SDS in SDS-PAGE?
17. Define tracking dye.
18. Give two examples of buffers used for electrophoresis.
19. Fill in the blank.
    The electrophoretic mobility denoted as μ is mathematically expressed as---------.
20. Name two stain used to detect proteins on PAGE.

Q.2 A) Elaborate on addition reaction. (08)

Q.2 B) Discuss in brief biological role of carboxypeptidase. (07)

OR

Q.2 C) Explain function of haemoglobin in detail. (08)

Q.2 D) Discuss the role of metal ions in biological system with example. (07)

Q.3 A) Explain principle and working of ion exchange chromatography. (08)

Q.3 C) What is thermocouple? Explain its use in measurement of temperature. (08)

Q.3 D) Describe the determination of 'η' of a liquid by the falling sphere method. (07)

Q.4 A) Discuss the principle and working of UV spectroscopy. (08)

Q.4 B) Elaborate on luminometry. (07)

OR

Q.4 C) Explain the principle and instrumentation in infrared spectroscopy. (08)

Q.4 D) Discuss the instrumentation and application of light scattering spectroscopy. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Interference
b. Spontaneous emission
c. Biomagnetism
d. Applications of ultrasound waves
e. Types and properties of spectra

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SYB.T
23/10/23

M231023839

Time – 2 1/2 hours Marks–75

Note: Attempt all questions.
All questions carry equal marks.
UnderQ.2,Q.3 and Q.4 attempt A and B OR C and D
Draw neat labeled diagrams wherever necessary.

Q.1 A) Attempt any fifteen of the following. (15)

1. What is the site for T cell maturation in humans?
2. The full form of MAC is --------
3. State true or false – Immune clearance means removal of immune complexes from circulation and deposit them into spleen and liver.
4. ---------- is also known as C_3 convertase.
5. What is the role of factor D in alternate pathway?
6. Write any two examples of anaphylatoxins.
7. Enlist the heterodimers present in the CD3 complex associated with T cell receptor.
8. Define phagocytosis.
9. Which co-receptor is present on the T helper cell membrane?
10. What is the role of IP_3 in T cell activation?
11. MHC is a collection of genes arranged within a long continuous stretch of DNA on chromosome number --------- of human.
12. Class II MHC molecules bind peptides and present this peptide to --------- cell.
13. Which type of antigens are processed and presented in cytosolic pathway of antigen presentation?
14. What is the full form of TAP protein?
15. State true or false: T helper cells secrete cytokines to activate B cells.
16. Write one application of indirect ELISA.
17. State true or false: Formation of an Ag-Ab lattice depends on the valency of both the antibody and antigen.
18. Identification of a specific protein in a complex mixture of proteins can be accomplished by a technique known as --------
19. In Rocket electrophoresis antigen used for analysis must have ----------charge.
20. What is the full form of CIEP?

Q.2 A) Describe the structure and function of spleen. (08)

Q.2 B) Describe the lectin pathway of complement activation (07)

OR

Q.2 C) Elaborate on regulation of complement system. (08)

Q.2 D) Describe the steps involved in Membrane attack complex formation. (07)

Q.3 A) Explain the endocytic pathway of antigen presentation. (08)

Q.3 B) Describe the structure and function of T cell receptor complex. (07)

OR

Q.3	C)	Describe the steps involved in T cell activation.	(08)
Q.3	D)	Compare and contrast on MHC Class I molecule and MHC Class II molecule.	(07)
Q.4	A)	Describe the types of immunodiffusion and their function.	(08)
Q.4	B)	Explain the technique of 2D immunoelectrophoresis.	(07)

OR

Q.4	C)	Elaborate on ELISPOT assay.	(08)
Q.4	D)	Explain in detail the technique of indirect immunofluorescence.	(07)

Q.5 **Write short notes on any three of the following.** (15)

a. Primary lymphoid organ.
b. Inflammation.
c. T lymphocytes.
d. B cell- T cell cooperation.
e. Coomb's test.

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SYBSC B.T
25/10/23

M23[illegible]023847

Time – 2 ½ hours Marks–75

Note: Attempt all questions.
All questions carry equal marks.
Under Q.2,Q.3 and Q.4 attempt A and B OR C and D
Draw neat labelled diagrams wherever necessary.

Q.1 A) Answer the following (any fifteen). (15)

1. What is transcription?
2. The RNA polymerase II located in _____ .
3. Write the role of Activators in eukaryotic transcription.
4. Define introns.
5. State the function of RNA polymerase.
6. In prokaryotes and eukaryotes. the regions of DNA that contain the genes for rRNA are called _____.
7. Write the role of TFIID in eukaryotic transcription.
8. Define reversion.
9. State the function of ribosomal binding site.
10. Write the name of the codon that terminates the translation process.
11. The amino acid formyl methionine (fMet) is the initial amino acid during initiation of translation. (State true or false)
12. What is degeneracy?
13. Write long form of SRP.
14. Enlist the codons that codes Glutamine amino acid.
15. State the role of Inducer in lac operon.
16. Give the function of permease enzyme in E.coli.
17. Define repressible operon.
18. Write the function of lacI gene.
19. What is the role of CI protein in lambda operon.
20. The short transcripts are terminated by a process called _____ .

Q.2 A) Discuss in brief polyadenylation process in eukaryotes. (08)

Q.2 B) Explain the termination process of transcription in bacteria. (07)

OR

Q.2 C) Describe in detail prokaryotic transcription. (08)

Q.2 D) Describe in detail role of initiation factors in eukaryotic transcription with diagrammatic representation. (07)

Q.3 A) Describe the amino acylation cycle in translation process. (08)

Q.3 B) Discuss the termination of translation in prokaryotes. (07)

OR

Q.3 C) What is t-RNA? Explain the clover leaf model of t-RNA. (08)

Q.3 D) Differentiate between initiation of translation between prokaryotes and eukaryotes. (07)

Q.4 A) Give an account on lactose as a primary carbon source for *E.coli*. (08)

Q.4 B) Explain the Cis dominant effect of lacO⁻ mutation in partial diploid strain of *E.coli* in presence of inducer. (07)

OR

Q.4 C) Describe in detail regulation of trp Operon. (08)

Q.4 D) Discuss in brief regulation of Gene expression in Phage Lambda. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Translocation
b. Role of release factor
c. Positive control of lac operon
d. Post transcriptional modification
e. Protein sorting

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SYBSC BT
26/10/23

Time – 2 1/2 hours

Marks–75

Note: Attempt all questions.
All questions carry equal marks.
For Q.2,Q.3 and Q.4 attempt A and B OR C and D
Draw neat labeled diagrams wherever necessary.

Q.1 A) **Do as directed. (Any fifteen)** (15)

1. Define inspection.
2. Write the two facility provided to laboratory according to GLP.
3. What is significance of good organization?
4. Define archiving.
5. Give the role of BSC.
6. Laboratory directors or principal investigators should train and retrain new staff to the point where aseptic techniques and safety precautions become second nature .(State true or false)
7. Write full form of OSHA.
8. Enlist personal protective equipment.
9. Which infectious agent assigned in risk group -1?
10. ----------is the preferred method for all decontamination process at biosafety level 1.
11. Give the role of induction training.
12. What is the raw data in laboratory documentation?
13. Define biosafety.
14. Decontamination of all liquid wastes must be documented.(State true or false)
15. Give any two examples of drugs that can be metabolized by microorganisms.
16. The greater the solute concentration, the lower is the water activity.(State true or false)
17. Write the two examples of microbial toxins.
18. The Contaminated products injected directly into the ---------- cause the most serious problems.
19. Enlist the solubilizersused in formulating pharmaceutical products.
20. Write the two types of the ophthalmic preparations.

Q.2	A)	Explain hazardous characteristics of laboratory procedures.	(08)
Q.2	B)	Describe guidance to good laboratory procedures.	(07)
		OR	
Q.2	C)	Explain the biological risk assessment.	(08)
Q.2	D)	Elaborate the preparation of standard operating procedure.	(07)
Q.3	A)	Describe the biosafety provided in diagnostic lab.	(08)
Q.3	B)	Explain specimen storage process in laboratory.	(07)
		OR	
Q.3	C)	Give an account on biosafety level -2.	(08)
Q.3	D)	Explain the laboratory equipment used in labs.	(07)
Q.4	A)	Describe the observable effects of microbial attack on pharmaceutical products.	(08)
Q.4	B)	Explain in detail different types of sterile pharmaceutical products.	(07)
		OR	
Q.4	C)	Give an account on the concept of pyrogen and sources of pyrogens.	(08)
Q.4	D)	Describe the factors affecting microbial spoilage of pharmaceutical products.	(07)
Q.5		**Write short notes on any three of the following.**	(15)
	a.	Archiving	
	b.	Role of humans as a source of microbial contamination of pharmaceutical products.	
	c.	Microbial toxins as a health hazard	
	d.	Usability and traceability	
	e.	HEPA filter	