S.Y.B.T

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Oct. 2024-25

Regular Exam.

Sem - III.

S101024 05 M

SYBT
10/10/24

Time: 2 1/2 hours | Marks: 75

Note: 1) All questions are compulsory.
2) For Q.2, Q.3 and Q.4 attempt A and B OR C and D.
3) Draw neat labeled diagrams wherever necessary.
4) Figures to the right indicate full marks.

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

1. Define agitation
2. Give examples of carbon sources used in fermentation medium.
3. Define rheology.
4. State the role of spectrophotometer in control process.
5. Give examples of electrodes used in pH measurement.
6. What is filter sterilization?
7. Enlist the examples of minerals used in fermentation medium.
8. Give the advantages of inhibitors used in medium.
9. ---------- are surface active agents reduces surface tension in foam. (Fill in the blank)
10. Mention the name of methods used in temperature control.
11. Enlist the ions measured by ion-specific sensors.
12. Give the use of near infra-red spectroscopy.
13. Define sporulation.
14. What is in-line sensors?
15. Give the advantage of aerobic fermentation.
16. Define: surface fermentation.
17. Enlist the hormones produced by industrial process.
18. Mention the organism used in ethanol production in industry.
19. Give applications of amylase enzyme.
20. Name the organism used in glutamic acid production.

Q. 2A) Explain the structure and function of airlift fermentor. (8)

Q. 2 B) Elaborate on concept of inoculum and production medium in fermentation. (7)

OR

Q. 2 C) Explain the importance of sterilization of the feeds and liquid wastes. (8)

Q. 2 D) Describe the factors affecting the choice of nitrogen sources with suitable examples. (7)

Q. 3 A) Explain in detail foaming control and measurement in fermentation process. (8)

Q. 3 B) Elaborate on scale down approach of batch sterilization process. (7)

OR

Q. 3 C) Describe in detail the development process of fungal inoculum. (8)

Q. 3 D) Discuss the instruments used for pressure measurement in fermentation. (7)

Q.4 A) Explain the role of micro-organisms in streptomycin production with suitable examples. (8)

Q.4 B) Describe the significance and applications of aerobic and anaerobic fermentation. (7)

OR

Q.4 C) Elaborate the steps involved in industrial penicillin production. (8)

Q.4 D) Explain in detail the significance of batch fermentation. (7)

Q. 5 Write short notes from the following. (Any 3) (15)

A) Sterilization of fermentor

B) Mechanisms of filter sterilization

C) Inoculum development of yeast

D) Solid state fermentation

E) Industrial amylase enzyme production

SY.BT
11/10/24

S11102414M

Time -2.30 hours

Marks-75

Note:-

1.All questions are compulsory.

2.Figures to the rights indicate full marks.

3.Draw neat labeled diagrams wherever necessary.

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

1. Define latent disease.
2. What is zoonoses?
3. Contact transmission is the spread of an agent of disease by ----------.(Fill in the blanks)
4. Give the two examples of vectors that transmit disease.
5. Define biological transmission.
6. What is carriers?
7. Define analytical epidemiology.
8. What is liquefaction?
9. Mention two characteristics of EHEC.
10. The tuberculin skin test used in diagnosis of tuberculosis.(State true or false)
11. Which disease caused by *S.pyogenes?*
12. Give the name of differential media used for isolation of *E.coli*.
13. Which toxin produced by *S.aureus*?
14. Enlist the name of tests used in lab diagnosis of tuberculosis.
15. What is causative agent of bacillary dysentery?
16. Gonorrhea is caused by ---------.(Fill in the blanks)
17. Define Ophthalmic neonatorum.
18. Give the names of bacteria which cause nosocomial infection.
19. In the primary stage of Syphilis the initial sign is a small, hard based ----------or sore that appears at the sign of infection. (Fill in the blanks)
20. State the significance of widal test.

Q.2	A)	Explain the pattern of infections.	(08)
Q.2	B)	Describe the spread of infection by vectors.	(07)
		OR	
Q.2	C)	Explain the virulence and types of infections.	(08)
Q.2	D)	Give an account on normal flora of intestinal tract and mouth.	(07)
Q.3	A)	Describe the stages of tuberculosis disease development.	(08)
Q.3	B)	Give an account on pathogenesis of *S.pneumoniae.*	(07)
		OR	
Q.3	C)	Compare between the ETEC and EPEC.	(08)
Q.3	D)	Describe the virulence factor and infection of *S.pyogenes.*	(07)
Q.4	A)	Give an account on the epidemiology of *Shigella.*	(08)
Q.4	B)	Explain the *Salmonella* gastroenteritis infection.	(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. Predisposing factors

e. Enlist characteristics of *E.coli*

SYBT
15/10/24

S151024 32 M

Time – 2 $^{1/2}$ hours **Marks–75**

N.B. - 1) All questions are compulsory.
2)Figures to the right indicate full marks.
3) Draw neat labeled diagrams wherever necessary.

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

1. Give a property of LASER.
2. Define interference of light.
3. What is spontaneous emission?
4. Mention common fixative used in the TEM for fixation of sample.
5. Give disadvantages of electron microscopy.
6. What is angular dispersion?
7. Give an application of fluorescence microscopy.
8. Define audible waves.
9. What is wettability?
10. Define viscosity of a fluid.
11. Give modes of heat transfer.
12. What is meant by ferromagnetism?
13. Give applications of surface tension.
14. What unit is used for measurement of viscosity?
15. Define extrinsic fluorescence.
16. Give properties of spectra.
17. Name any two detectors used in spectrophotometer.
18. What is the law of absorption in spectroscopy?
19. Give the difference between spectrophotometer and spectrofluorimeter.
20. Enlist types of spectrum.

Q.2 A) Explain in detail specimen preparation for SEM. **(08)**

Q.2 B) Discuss in brief reflection of light. **(07)**

OR

Q.2 C) Explain the components of LASER and its action in detail. **(08)**

Q.2 D) Discuss the principle and construction of fluorescent microscope. **(07)**

Q.3 A) Give an account on angle of contact. **(08)**

Q.3 B) Discuss in brief an Ostwald's viscometer for estimation of viscosity. **(07)**

Q.3 C) Explain the platinum resistance electrode for measurement of temperature in detail. **(08)**

Q.3 D) Give an account on paramagnetism. **(07)**

Q.4 A) Discuss the principle and working of light scattering spectroscopy. **(08)**

Q.4 B) Elaborate on fluorescence spectroscopy. **(07)**

OR

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

Q.4 **D)** Discuss the construction and working of UV spectroscopy. (07)

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

a. Immunoelectron microscopy
b. Construction of TEM
c. Applications of ultrasound waves
d. Nuclear magnetism
e. Luminometry

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5487
16/10/24

Time: 2 1/2 hours | Marks: 75

Note: 1) All questions are compulsory.
2) For Q.2, Q.3 and Q.4 attempt A and B OR C and D.
3) Draw neat labeled diagrams wherever necessary.
4) Figures to the right indicate full marks.

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

1. State the site of B-cell maturation in humans.
2. Give the full form of MAC.
3. Immune clearance means removal of immune complexes from circulation. (State true or false)
4. State the role of Factor D in alternate pathway.
5. Class II MHC molecules bind peptides and present this peptide to ---- cell. (Fill in the blank)
6. Give the role of TAP protein.
7. Enlist the secondary lymphoid organs.
8. Which co-receptor is present on the T-helper cell membrane?
9. Give the role of IP3 in T-cell activation.
10. MHC is a collection of genes arranged with along continuous stretch of DNA on chromosome ------ of human. (Fill in the blank)
11. Give examples of anaphylatoxins.
12. Define phagocytosis.
13. T_H cells secrete cytokines to activate B-cells. (State true or false)
14. Which dye emits deep red color while used in immunofluorescence technique?
15. State the application of western blotting technique.
16. Formation of an antigen-antibody lattice depends on the valency of both antigen and antibody. (State true or false)
17. Give the full form of CIEP.
18. State the significance of 2D immunoelectrophoresis.
19. In rocket electrophoresis, antigen used for analysis must have------ charge. (Fill in the blank)
20. Give the application of ELISA.

Q. 2A) Explain in detail the classical pathway of complement system. **(8)**

Q.2 B) Discuss the structure and function of thymus with suitable diagram. **(7)**

OR

Q. 2 C) Describe the types of lymphoid cells with suitable diagram. **(8)**

Q. 2 D) What is MALT? Explain the structure of gastrointestinal tract membrane. **(7)**

Q. 3 A) Elaborate on B-cell co-receptor complex in enhancement of B-cell response. (8)

Q. 3 B) Describe in detail co-stimulatory signals are required for full T-cell activation. (7)

OR

Q. 3 C) Discuss the structure of T-cell receptor complex with suitable diagram. (8)

Q. 3 D) Describe in detail the structure and function of MHC class II molecule. (7)

Q.4 A) Explain in detail the sandwich ELISA technique. (8)

Q.4 B) Give an account on the technique of agglutination inhibition. (7)

OR

Q.4 C) Explain in detail ouchterlony's precipitation method. (8)

Q.4 D) Discuss in brief the technique of flow cytometry. (7)

Q. 5Write short notes from the following. (Any 3) (15)

A) Structure and function of bone marrow

B) MHC class I molecule

C) B-cell maturation

D) Fluorescence microscope

E) Complement fixation test

S17102447M

SYBT
17/10/24

Time – 2 1/2 hours Marks-75

Note:

1. All **questions** are compulsory.
2. **Figures** to the **rights indicates** full marks.
3. Draw **neat labeled diagrams** wherever necessary.

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

1. TATA element is located----------upstream of the transcription start site in eukaryotes. (Fill in the blank)
2. What is transcription?
3. Define ORF.
4. The GGG codes ---------- amino acid. (Fill in the blank)
5. Aminoacylation of a t-RNA molecule by aminoacyl-tRNA synthetase to produce an----------. (Fill in the blank)
6. The entire *trp* operon is approximately ----------base pairs long. (Fill in the blank)
7. Holoenzyme is also called as complete enzyme. (State True or False)
8. Give the role of Shine dalgarno sequence.
9. Define a Cis –dominant gene.
10. The---------- gene is responsible to synthesize repressor molecule in lac operon. (Fill in the blank)
11. Enlist stop codon.
12. Tryptophan operon is an example of a ---------- operon system. (Fill in the blank)
13. A sigma factor is required for elongation and termination stages of transcription. (State true or false)
14. What is ribozyme?
15. Give the role of β -Galactosidase?
16. Give role of cAMP.
17. The correct amino acid is attached to the tRNA by an enzyme called-------. (Fill in the blank)
18. In Elongation factor, EF-G present in ----------(Fill in the blank)
19. Define aminoacylation.
20. In bacteria the RNA transcript functions directly as the ----------. (Fill in the blank)

Q.2 A) Describe initiation of transcription at promoter level in prokaryotes. **(08)**

Q.2 B) Explain spliceosome model with diagrammatic representation in eukaryotes. **(07)**

OR

Q.2 C) Describe termination of transcription in bacteria. **(08)**

Q.2 D) Compare between eukaryotic and prokaryotic transcription. **(07)**

Q.3 A) Elaborate structure and functions of ribosomes in prokaryote and eukaryote. **(08)**

Q.3 B) Explain initiation of translation in prokaryotes. (07)

OR

Q.3 C) Distinguish between termination of translation in prokaryotes and eukaryotes. (08)

Q.3 D) Discuss in brief genetic code is a triplet code. (07)

Q.4 A) Explain the role of CAP and cAMP in positive regulation of lac operon. (08)

Q.4 B) Elaborate on selection of lytic or lysogenic pathway by lambda phage. (07)

OR

Q.4 C) Give an account on arabinose operon. (08)

Q.4 D) Describe in detail regulation of trp Operon. (07)

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

a. Protein sorting.
b. 5 'capping processes.
c. Deciphering the genetic code.
d. Gene Silencing.
e. RNA editing.

S18102458M

SYBSc
18/10/24

Time – 2 1/2 hours Marks–75

Note:-

1.**All questions** are compulsory.

2.Figures to the rights indicate full marks.

3.**Draw neat labeled diagrams** wherever necessary.

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

1. Enlist primary factors in risk assessment.
2. What is LAI ?
3. Give the significance of NIH guideline.
4. Define GLP.
5. Give the examples of infectious agents in Risk group 2.
6. State the significance of animal facility.
7. Give the examples of safety equipment used in laboratory.
8. Enlist chemical agent used for decontamination of large surfaces of lab.
9. State the significance of HEPA filter.
10. Give the role of vaccines in occupational health.
11. Enlist types of training for lab workers and staff.
12. Give the two examples of secondary barriers.
13. Define validation.
14. What is primary barriers?
15. Define risk management.
16. What is competence?
17. Extremes of pH prevent microbial attack. (State True or false).
18. Which bacteria that can contaminate contact lens solutions?
19. Define pyrogens.
20. Enlist the three steps of freeze drying.

Q.2 **A)** Give an account on the preparation of SOPs. (08)

Q.2 **B)** Describe handling of cell cultures used in laboratory. (07)

OR

Q.2 **C)** Explain the audits and audit report for performing good laboratory practices. (08)

Q.2 **D)** Describe hazardous characteristics of an agent used in lab. (07)

Q.3	**A)**	Give an account on good diagnostic lab practice and procedures in biosafety level 1.	(08)
Q.3	**B)**	Describe the process of decontamination of hazardous material in laboratory.	(07)
		OR	
Q.3	**C)**	Explain the special practices and safety equipment in biosafety level 3.	(08)
Q.3	**D)**	Elaborate on the occupational health.	(07)
Q.4	**A)**	Describe the factors determining the outcome of a medicament borne infection.	(08)
Q.4	**B)**	Elaborate on pharmaceutical ingredients susceptible to microbial attack.	(07)
		OR	
Q.4	**C)**	Describe the factors affecting microbial spoilage of pharmaceutical products.	(08)
Q.4	**D)**	Explain the sources of contamination in pharmaceutical products	(07)
Q.5		**Write short notes on any three of the following.**	(15)
	a.	Suit laboratory	
	b.	History of GLP	
	c.	Emergency/incident response	
	d.	Bioburden	
	e.	Personal protective equipment	