

B.Sc. Part II (SEM -IV) End semester Examination
Question Bank
BIOTECHNOLOGY (ENTIRE)
Immunology (BBTT-401)
Subject code: -30031

Q.1 Define the following terms (25)

[2 Marks each]

1. Innate immunity
2. Active Immunity
3. Antigen
4. Pyrofactors
5. Agglutination
6. Aquired immunity
7. Passive immunity
8. Antibody
9. Pyrogens
10. Precipitation
11. Immunity
12. Active immunity
13. Immunoglobulin
14. Pyrogens
15. Agglutination
16. Flocculation
17. Commensals
18. Pathogens
19. Vaccines
20. Drugs
21. Lymphoid organs
22. Complement fixation
23. Virus
24. Precipitation.
25. Portal of entry.

Q. 2 Long answer questions (15)**[10 Marks each]**

1. Explain types of immunity with special reference to innate immunity.
2. Explain first line defense with physical ,chemical and biological barriers..
3. Explain primary organs of immune system.
4. Explain types of immunity with special reference to acquired immunity.
5. Explain second line of defense mechanism..
6. Explain secondary organs of immune system
7. Explain types of immunity with special reference to Innate immunity.
8. Explain physical and biological barriers of first line of defense.
9. Explain primary organs of immune system.
10. Write an essay on B-cells and T-cells.
11. Write an essay on Broad category of leucocytes.
12. Write an essay on Factors affecting antigenecity.
13. Explain basic structure of Antibody with IgG.
14. Explain basic structure of Antibody with IgM
15. Explain basic structure of Antibody with IgD and IgE.

Q. 3Short answer question(30)**[5 Marks each]**

1. Write a note on B-cells.
2. Note on Primary immune response.
3. Basic structure of Immunoglobuline.
4. Note on ELISA
5. Leucocytes with their role and properties
6. Note on IgG
7. Write a note on T-cells.
8. Note on Primary immune response
9. Basic structure if Immunoglobuline.
10. Note on Complement fixation.
11. Leucocytes with their role and properties
12. Note on IgM
13. Write a note on Natural killer cells.
14. Note on secondary immune response
15. Basic structure if Immunoglobulin.
16. Note on Agglutination
17. Leucocytes with their role and properties
18. Note on IgA
19. Note on IgD
20. Note on IgE
21. Parasites
22. Viruses
23. Note on Precipitation

24. Note on Neutralization
25. Note on ,Principle of ELISA
26. Characteristics of Salmonella
27. Acquired immunity
28. Inborn immunity
29. Specific defense mechanism
30. Non specific defense mechanism.

BBTT 402 ADVANCES IN CELL BIOLOGY

Q.1 Define following terms.

1. What is Meiosis?
2. Define Secondary Messenger.
3. Define Necrosis.
4. What is Protein trafficking?
5. Define Ligand.
6. Give Phases of Cytokinesis and its diagram.
7. Write the examples of proto-oncogenes
8. Define Molecular Chaperons.
9. Write a role of ATM and ATR in DNA damage
10. Define Anaphase.
11. Define CDK cyclins.
12. Define Nascent Protein
13. What is Secretory pathway
14. Give diagrammatical representation of $G_{\alpha q}$ role in the DAG formation.
15. Define Mitosis.
16. Define Secondary Messenger.
17. Define Co-translational Translocation.
18. Define Protein targeting.
19. Draw Labeled Diagram Synaptic Signaling.
20. Draw labeled Diagram of G-Protein Regulation.
21. Diagrammatical representation of $G_{\alpha q}$ role in the DAG formation
22. Write types of receptor tyrosine kinase
23. Explain the types of tumors
24. Write properties of cancer cells.
25. Explain is hey flick limit.
26. Explain warberb effect in cancer cells

27. Write the examples of proto-oncogenes
28. Enlist different checkpoints involved in the cell cycle
29. Explain role of cyclin in cell cycle
30. Define Signal Transduction.

Q.2 Attempt any two of the following.

1. Explain in detail general principals of cell signaling.
2. Describe in detail Co- translational mechanism of nascent polypeptide chain to ER lumen.
3. Explain the phases in mitosis and their significance.
4. Briefly explain regulation of glycogen metabolism by epinephrine
5. Describe in detail Post translational mechanism of nascent polypeptide chain to ER lumen.
6. Describe in detail phases of meiosis and its significance.
7. What is Cell Signaling? Describe in detail mechanism of Enzyme linked receptor.
8. What is protein sorting? Describe in detail transport of protein into mitochondria.
9. What are the phases of cell cycle? Explain control of cell cycle.
10. . What is Signal transduction? Explain G-protein linked signal transduction.
11. Define Secretory pathway. Explain Post translational mechanism of protein trafficking.
12. What are the phases of cell cycle? Explain control of cell cycle.
13. What is Cancer? Explain various causes of cancer.
14. Define Cell Signaling. Explain in detail general principals of cell signaling.
15. What is mitosis? Explain the phases in mitosis and there significance.
16. Explain various types of G-Protein Receptor along with their abnormalities.
17. What is cell surface receptor? Explain G- protein linked receptor.
18. Explain in detail phases of cell cycle.
19. Briefly explain regulation of glycogen metabolism by epinephrine
20. Write note on carcinogens.

21. Role of p53 gene in the cancer biology
22. Explain the fate of p53 in normal cells
23. Explain role of ATM and ATR in G1/S check points

Q.3 Attempt any four of the following.

1. Write a note on Programmed cell death.
2. Explain transport of protein to peroxisomal matrix.
3. Describe IP₃ and DAG Pathway.
4. Explain Gap junction and combinatorial signaling.
5. Write a note on significance of meiosis.
6. Explain the types of tumors.
7. Explain Cell cycle and its check points.
8. Explain transport of protein in Chloroplast.
9. Describe Ion channel linked receptor.
10. Give the significance of Mitosis.
11. Write a note on Types of cancer.
12. Write a note on p53.
13. Write a note on phases of Mitosis.
14. Write a note on significance of meiosis.
15. Explain regulation of G-protein coupled receptor
16. Write a note on Anaphase promoting complex.
17. Explain transport of protein in Chloroplast.
18. Give the significance of Mitosis.
19. Explain Types of cell division.
20. Write a note on Synaptonemal Complex.
21. Describe Ion channel linked receptor.

22. Describe Co- translational translocation.
23. Write note on carcinogens.
24. Explain transport of protein in peroxisome.
25. Describe Co- translational translocation.
26. Write a note on Anaphase promoting complex.
27. Describe Enzyme linked receptor.
28. Synaptic and Combinatorial Signaling.
29. CDKs and cyclins
30. Checkpoints of cell cycle
31. State the differences between apoptosis and necrosis
32. Structure of G-protein coupled receptor
33. Explain regulation of G-protein coupled receptor
34. Explain role of $G\alpha_S$ in cholera toxin.
35. State the differences between tumor suppressor genes and proto-oncogene
36. Write a note on eukaryotic cell cycle
37. Explain Wee I kinase in detailed
38. Explain activatory kinase in detailed
39. Explain the role E3 ligase

Question bank 404 Molecular Biology II

Q 1: Answer the following

(2 Marks)

1. Transcription
2. RNA processing.
3. polyadenylation
4. Universal code
5. RNA editing
6. Termination codon
7. Acetylation
8. Degeneracy
9. Promoter
10. Enhancers
11. Activators
12. Repressor
13. Colinearity
14. Glycosylation
15. Initiation codon
16. Phosphorylation
17. Stop codon
18. 5' capping
19. RNA polymerase
20. RNA Splicing
21. Wobble hypothesis
22. Nonsense codon
23. polarity
24. Colinerity
25. Degeneracy
26. Non ambiguous
27. Anticodon
28. Gene
29. codon
30. Translation

Q2: Attempt any one (10 M)

1. Explain Transcription in eukaryotes
2. Explain Transcription in prokaryotes
3. Write a note on Regulation of gene expression in prokaryotes.
4. Write a note on Regulation of gene expression in eukaryotes.
5. Explain in detail RNA processing.
6. Explain assignment of codons with known sequences
7. Explain in detail of translation process
8. Enlist post transcriptional modification and explain the RNA splicing in detail
9. Explain assignment of codons with Unknown sequences
10. Enlist post transcriptional modification and explain the RNA editing in detail
11. Enlist post transcriptional modification and explain the 5' capping in detail
12. Enlist post transcriptional modification and explain the 3' poly adenylation in detail
13. Explain in detail arabinose operon and tryptophan operon
14. Explain in detail arabinose operon and Lac operon
15. Explain in detail Lac operon and tryptophan operon

Q3: Attempt any two. (5 M)

1. Write a note on RNA polymerase
2. Explain Regulation of gene expression in Lac operon
3. Explain Regulation of gene expression in Tryptophan operon
4. Explain Regulation of gene expression in Arabinose operon
5. Write a note on RNA splicing
6. Write a note on RNA editing
7. Write a short note on initiation complex from translation process
8. Give the difference between Arabinose operon and Tryptophan operon
9. Explain in detail Eukaryotic RNA polymerase.
10. Write a note on polyadenylation.
11. Write a note on structure and role of ribosome in translation
12. Explain in detail phosphorylation
13. Explain in detail 5'capping
14. Enlist Transcription factors involved in the eukaryotic transcription with detailed molecular weight and roles
15. Explain in detail prokaryotic RNA polymerase.
16. Write a note on Variation in genetic code
17. Explain in detail protein folding
18. Give the characteristics of Genetic code
19. Write a short note on wobble hypothesis
20. Explain the Decipheration of genetic code

21. Explain the Polyuridylic method for decipheration of genetic code
22. Explain the Acid method for decipheration of genetic code
23. Explain the Copolymers method for decipheration of genetic code
24. Explain the structure and role of ribosome in translation
25. Explain the amino acid tRNA complex formation
26. Write a short note on post translational modifications
27. Write a short note on promoter and enhancer
28. Write a short note on enhancer and activators
29. Write a short note on repressors or co-repressors
30. Write a short note on termination of transcription process

BBTT 405 DEVELOPMENTAL BIOLOGY

2 marks question

1. Define differentiation.
2. Double fertilization.
3. Pollen grain.
4. Define Regeneration in animals.
5. Calyx.
6. Define Apogamy.
7. Define Blastulation.
8. Define microsporogenesis in angiosperms.
9. Significance of Double fertilization.
10. Corolla.
11. Define Regeneration in animals.
12. Androecium.
13. Define Centrolecithal egg.
14. Define megasporogenesis in angiosperms.
15. Bisporic embryo sac.
16. Define Redifferentiation.
17. Significance of differentiation.
18. Embryo sac.
19. Endosperm significance
20. Significance of Regeneration in animals.
21. Style.
22. Significance of Blastulation.
23. Importance of microsporogenesis in angiosperms.
24. Stigma.
25. Significance of megasporogenesis in angiosperms.
26. What is Bisporic embryo sac.

10 marks question

1. What is gametogenesis, explain male gametophyte development in angiosperms.
2. What is gametogenesis; explain female gametophyte development in angiosperm.
3. Describe in detail foetal membranes and its significance.
4. What is gametogenesis; explain the process of spermatogenesis in animals.
5. Explain regeneration mechanism and factors affecting on regeneration.
6. Explain in detail self incompatibility and its significance.
7. What is gametogenesis; explain the process of spermatogenesis in animals.
8. Explain regeneration mechanism and factors affecting on regeneration.
9. What is self incompatibility and state its importance.
10. Explain types and significance of placenta.
11. Describe microsporogenesis and megasporogenesis and what is its role in plants.
12. Explain regeneration mechanism and factors affecting on regeneration.
13. Describe shoot and root apex.
14. Describe in detail Differentiation and its types in vertebrates.
15. Describe in short male and female gametophyte development in plants.

4 marks question

1. Explain Developmental plasticity.
2. Explain organization of plant meristem.
3. Explain types of endosperm.
4. Explain pollen germination.
5. Describe polyembryony and its types.
6. Explain Apomixis and state its significance.
7. Write in short microspogenesis in plants and its significance.
8. What is organization of root apical meristem.
9. Describe root apex.
10. Explain self incompatibility.
11. Describe development of male gametophyte in angiosperms.
12. Explain term apomixis.
13. Explain polyembryony and state its significance

14. Explain pollen germination.
15. Write a note on cleavage.
16. Write in short megasporogenesis in plants and its significance.
17. Write a note on Dedifferentiation in animals.
18. Describe shoot apex.
19. Describe Fertilization in animals.
20. What is shoot apical meristem.
21. Explain types and significance of placenta.
22. Explain term apomixis.
23. Explain types and significance of foetal membrane.
24. Write a note on theories of shoot apical meristem.
25. Explain types and significance of placenta

BBTT 406: ANIMAL TISSUE CULTURE

Define: (2 Marks each)

1. What is Animal Tissue Culture?
2. Balance salt solution
3. Serum
4. Importance of centrifuge
5. Importance of inverted microscope
6. Importance of CO₂ incubator
7. Importance of laminar air flow
8. Plasma
9. Culture media
10. Define media
11. Sterilization
12. Cultured cells
13. Cell adhesion
14. Cell proliferation
15. Cell differentiation
16. Transformed cells
17. Apoptosis
18. Senescence
19. Cell synchronization
20. Primary cell culture
21. Cell line
22. Subculture
23. Disaggregation of tissues
24. Immobilization
25. Continuous flow culture
26. Scale-up
27. Suspension-stirrer culture
28. Organ culture
29. Histotypic culture
30. Stem cells

31. Cryopreservation
32. Cell repositories
33. Monoclonal antibodies
34. Tissue engineering

Long answer (10 Marks each)

1. Enlist the different equipment's used in animal tissue culture laboratory with its importance.
2. Describe different culture media used in animal tissue culture with its physiochemical properties.
3. Give the detail account of different sterilization methods applicable in ATC.
4. What is animal tissue culture? Mention the detail applications of animal cell culture.
5. What is a cultured cell? Describe the characteristics of cultured cells.
6. Give a detail account of growth parameter measurement of cultured cells.
7. Describe in detail cell synchronization along with importance of physical and chemical separation means.
8. Describe in detail any two scale up processes used in Animal Tissue Culture.
9. In ATC what are the basic techniques used for the cell culture or cell line growth and its maintenance.
10. Give a detail account on cryopreservation with its importance and limitations.
11. What are organ and histotypic culture and how it can be maintained in ATC laboratory?

Short note (5 Marks each)

1. Write a note on laminar air flow and CO₂ incubator used in ATC laboratory.
2. Write a note on Inverted microscope and centrifuge used in ATC laboratory
3. Glassware sterilization.
4. Write a note on sterility testing
5. Describe the media and reagent sterilization methods followed in animal cell culture
6. Write a note on physiochemical properties of culture media used in ATC.
7. Write a note on synthetic media
8. Write a note on balanced salt solution

9. Cell adhesion
10. Cell proliferation
11. Cell differentiation
12. Plating efficiency of cultured cells
13. Explain growth cycle of cell culture
14. Note on different substrates used for cell growth.
15. Write a note on cell separation by physical approach
16. Write a note on cell separation by chemical approach
17. Write a note on identification of specific cell lines
18. What is cellular senescence? How the senescence is measured?
19. What is apoptosis? How the apoptosis is measured?
20. Disaggregation of tissues.
21. Immobilized cell culture.
22. Write a note on maintenance of cell culture.
23. Continuous culture
24. Measurement of viability
25. What is primary cell culture
26. Write a note on scale up process
27. What suspension-stirrer culture? What are the parameters have to consider for scale up?
28. Write a note on monolayer-Roller bottle culture scale up process.
29. Write a note on organ culture
30. What is histotypic culture?
31. Write a note on stem cell culture.
32. What is cryopreservation? Discuss its importance in ATC.
33. What are cell repositories?
34. What is tissue engineering? Give its importance.
35. Discuss monoclonal antibodies production in animal cell culture