PBBTC01 - CELL AND DEVELOPMENTAL BIOLOGY

UNIT I: CELLULAR ORGANIZATION

PART-A

1. What is prokaryotic cell
2. Explain Eukaryotic cell
3. Major difference of prokaryotic and Eukaryotic cells
4. Role of lipid bilayer
5. Explain cell wall
6. Role of Nucleus
7. What is nucleolus
8. Function of nucleolus
9. Major role of Golgi bodies in cell function
10. What is lsosomes
11. Importance of endoplasmic reticulum
12. What is peroxisomes
13. Define plasmid
14. Role of plasmid
15. Role of chloroplast
16. Importance of cytoskeleton
17. Major role in mitochondria
18. Define Powerhouse of the cells
19. Explain types of mitochondria
20. Explain the matrix in the mitochondria

UNIT II: CELL CYCLE AND CELL SIGNALING

1. What is cell division
2. Explain different type of cell division
3. What is mitosis cell division
4. What is meiosis cell division
5. What is Interphase
6. What is Prophase
7. What is Metaphase
8. What is Anaphase
9. What is Telohase
10. What is cytokinesis
11. What are the different stages in mitosis cell division
12. What is gamete
13. What is oogenesis
14. What is speramatogenesis
15. What is G-Protein
16. What is cell surface receptor

17. Explain molecular chaperones
18. What is cell signaling
19. What is cellular communication
20. What is programmed death cells

UNIT III: CELL SIGNALING, CELLULAR COMMUNICATION

1. Role of ligand in cell communication
2. What is receptor protein
3. What is Paracrine signaling
4. What is Autocrine signaling
5. What is Endocrine signaling
6. Explain synaptic signaling
7. What is Signal transduction
8. What is protein kinase
9. What is phosphatase
10. Types of receptor in cell signaling
11. What is Cell surface receptor
12. Explain enzymatic receptor
13. What is G protein coupled receptor
14. Role of steroid hormone cell signaling
15. What is Receptor tyrosine kinas
16. What is mitogen activated protein kinase
17. What is GPCRs
18. What is neurotransmission
19. What is quorum sensing?
20. Explain bacterial chemotaxis

UNIT IV: BASIC CONCEPTS OF DEVELOPMENTAL BIOLOGY

1. Explain Stem cell
2. Explain different types of stem cells
3. Explain Human development of stem cells
4. What s Sex chromosome
5. What is sex linkage
6. What is chromosome linkage
7. What is Gametogenesis
8. What is Oogenesis
9. What is Spermatogenesis
10. What is blastula
11. What is gastrula
12. What is Metamorphosis
13. What are the different stages of Embryonic development
14. What is organogenesis
15. What is cleavage
16. What is patterning
17. What is Differentiation in embryonic development
18. What is trimester
19. What is Morphogenesis
20. What is Organogenesis

UNIT V: ADVANCES IN DEVELOPMENTAL BIOLOGY

1. What is *Danio rerio*
2. Major role of *Danio rerio* in Experimental research in developmental Biology
3. Physiological characterization of *Danio rerio*
4. What is postfertilization
5. What is Somitigenesis
6. What is geneknockting
7. What is nephronophthisis
8. Explain NPHP
9. Advantages of Experimental research in *Danio rerio*
10. Disadvantage of experimental research in *Danio rerio*
11. Write short notes on manipulation of Robust embryos
12. Uses of experiential research in developmental biology in drosophila
13. Disadvantage of experimental research in developmental biology in frogs
14. Role of animal ethical committee in experimental research in developmental biology
15. What is CPCSEA
16. Role of CPCSEA in experimental research in developmental biology
17. What is Xenopus Laevis
18. What is Blastula
19. What is Gastrula
20. What is Neurula

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PART-B

UNIT I: CELLULAR ORGANIZATION

1. Explain difference of prokaryotic and Eukaryotic cells
2. Explain Structure and function of plasma membrane
3. Define structure and function of mitochondria
4. Write short on nucleolus
5. Explain the type of lysosome
6. Brief explain about nucleus
7. Give a details on the ultra structure of mitochondria
8. Cytoskeleton is the driving force behind function of cells – substantiate the statement
9. Give a account on organismal theory
10. How DNA is packed so compactly inside a cells

UNIT II: CELL CYCLE AND CELL SIGNALING

1. Explain different type of cell – Surface receptor and cell signaling
2. Explain the extracellular matrix and the leucocytes migration
3. Describe the different stages in mitosis cell division
4. Describe the different stages of meiosis cell division
5. Write briefly about the protein synthesis
6. What are the molecular basic of mutation
7. Explain different stages of strategies of cell division
8. Give the significance of mitosis
9. Describe the brief cell ageing
10. Compare mitosis and meiosis cell division

UNIT III: CELL SIGNALING, CELLULAR COMMUNICATION

1. Describe intracellular and extracellular communication
2. Define Cellular Hemolysis
3. Write general principle of cell communication
4. Define following
    a. Cell adhesion
    b. Extracellular matrix
5. Give a account on neurotransmission and its regulation
6. Describe the bacterial toxin with suitable example
7. Define Quorum sensing
8. Describe the cancer and cell cycle
9. Define Ongogenes and Oncovirus
10. What is apoptosis? Explain cancer therapy.

UNIT IV: BASIC CONCEPTS OF DEVELOPMENTAL BIOLOGY

1. Give a details account on Stem cell
2. Define following
    a. Potency
    b. Commitment
3. Explain chromosomal inheritance

4. Define chromosomal inheritance and extra-chromosomal inheritance
5. Explain Gametogenesis
6. Define fertilization in Animals? Different type of stages in Animals development during fertilization?
7. Write about different type stage of cell development during plant fertilization?
8. Brief Embryonic development
9. Define Metamorphosis and Regeneration
10. Define Morphogenesis and organogenesis in plants and animals

UNIT V: ADVANCES IN DEVELOPMENTAL BIOLOGY

1. Explain experimental system of animal model in pharmacological research
2. Write about role of animal model in during experimental research in developmental biology
3. Give a details account on Zebrafish in experimental system in developmental biology
4. Write about the different stages in experimental system in animals model
5. Define the experimental system of frog in developmental biology
6. Uses of Sea urchin in experimental systems in developmental biology
7. Discuss about
    a. *Arabidopsis thaliana*
    b. *Dictyostelium discoideum*
8. Give a details account on Programmed cell death?
9. Define
    a. Aging
    b. Senescence
10. Discuss about *Drosophila melanogaster* in experimental research in developmental biology

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PART-C

UNIT I: CELLULAR ORGANIZATION

1. Give a details account on prokaryotic and Eukaryotic cells with suitable diagram?
2. Brief Structure and function of plasma membrane? Different type of lysosome
3. Give a details account on structure and function of mitochondria
4. Brief explain on nucleolus? Structure and function of nucleus.
5. Explain the type of lysosome? Define power hours of the cells.
6. Brief explain about nucleus? Function of nucleus.
7. Give details on the ultra structure of mitochondria? Write about the organisms theory.
8. Write about Cytoskeleton is the driving force behind function of cells – substantiate the statement
9. How DNA is packed so compactly inside a cells
10. Explain structure and function of Chloroplast? Define cytoskeleton.

UNIT II: CELL CYCLE AND CELL SIGNALING

1. Brief different type of cell – Surface receptor and cell signaling
2. Give a details account on extracellular matrix and the leucocytes migration
3. Write about the different stages in mitosis cell division with suitable diagram?
4. Write about the different stages of meiosis cell division with suitable diagram?
5. Give a details account on protein synthesis in cells
6. Brief the molecular basic of mutation
7. Write about the different stages of strategies of cell division
8. Write about the significance of mitosis
9. Give a details account on cell ageing
10. Write about Compare mitosis and meiosis cell division with suitable diagram

UNIT III: CELL SIGNALING, CELLULAR COMMUNICATION

1. Write about the intracellular and extracellular communication
2. Define Cellular Hemolysis? Explain Cell adhesion
3. Write about the general principle of cell communication? Define the extracellular matrix?
4. Give a detail account on neurotransmission and its regulation with suitable example
5. Describe the bacterial toxin with suitable example? Write about the Quorum sensing
6. Describe the cancer and cell cycle? Brief Metastasis?
7. Define Ongogenes and Oncovirus
8. What is apoptosis? Explain cancer therapy.
9. Define interaction of cancer cells with normal cells?
10. Write about the types of cancer therapy-types and approaches.

UNIT IV: BASIC CONCEPTS OF DEVELOPMENTAL BIOLOGY

1. Give a details account on Stem cell research in developmental biology
2. Write about the Potency? Define Commitment?
3. Brief chromosomal inheritance with suitable diagram?
4. Write about the chromosomal inheritance and extra-chromosomal inheritance
5. Write about the Gametogenesis with suitable diagram?

6. Write about the fertilization in Animals? Different type of stages in Animals development during fertilization?
7. Write about different type stage of cell development during plant fertilization?
8. Brief Embryonic development?
9. Give a detail account on Metamorphosis and Regeneration
10. Write about the Morphogenesis and organogenesis in plants and animals

UNIT V: ADVANCES IN DEVELOPMENTAL BIOLOGY

1. Write about the experimental system of animal model in pharmacological research?
2. Write about role of animal model in during experimental research in developmental biology?
3. Give a details account on Zebra fish in experimental system in developmental biology
4. Write about the different stages in experimental system in animals model
5. Define the experimental system of frog in developmental biology
6. Discuss about the Uses of Sea urchin in experimental systems in developmental biology
7. Write about the different developmental stages in *Arabidopsis thaliana* in experimental research? Write about the experimental research on developmental biology on *Dictyostelium discoideum*?
8. Give a details account on Programmed cell death?
9. Write about the Aging? Discuss about the Senescence?
10. Write about the *Drosophila melanogaster* in experimental research in developmental biology

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