

Reg.No :

Name :

MAHATHMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) REGULAR EXAMINATION

THIRD SEMESTER

DISCIPLINE SPECIFIC CORE COURSE (DSC A) - MG3DSCBTG201- CELL BIOLOGY AND GENETICS

(2024 ADMISSION ONWARDS)

Duration: 1½

Maximum Marks: 50

**Remember (K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and
Appreciation (Ap)**

Students should attempt at least one question from each course outcome to enhance their overall
outcome attainability

Part A

One word Answer

Answer any **10** questions

Each question carries **2** marks

- | | |
|--|------------|
| 1. Name two major proteins found in ECM and state their function. | [K]/ [CO1] |
| 2. Mention the types of crossing over? | [U]/ [CO3] |
| 3. Write any two functions of nucleus? | [U]/ [CO2] |
| 4. What are laws of genetics? | [K]/ [CO3] |
| 5. List any two factors that can alter gene frequency in a population. | [K]/ [CO3] |
| 6. Which are the protein involved in cell cycle regulation? | [U]/ [CO2] |
| 7. Name the check points involved in regulation? | [K]/ [CO2] |
| 8. Mention two roles of the extracellular matrix in animal cells. | [K]/ [CO1] |
| 9. Name two transport mechanisms in plasma membrane. | [U]/ [CO1] |
| 10. Name any two cell junctions. | [K]/ [CO2] |
| 11. Which are the organelles involved in protein synthesis. | [K]/ [CO2] |
| 12. What is called the observable characteristics of an individual organism? With example. | [U]/ [CO3] |

(10×2= 20)

Part B

Short essay

Answer any **5** questions

Each question carries **4** marks

- | | |
|--|------------|
| 13. Describe the structure and components of the extracellular matrix. | [K]/ [CO1] |
| 14. Explain the models of the plasma membrane. | [K]/ [CO1] |
| 15. Explain nucleus and its functions. | [U]/ [CO2] |

- | | |
|--|------------|
| 16. Describe the phases of the cell cycle with a diagram. | [K]/ [CO2] |
| 17. Explain Mendel's laws of inheritance with suitable examples. | [U]/ [CO3] |
| 18. Define mutation and explain its types. | [K]/ [CO3] |
| 19. Explain genetic equilibrium with Hardy-Weinberg principle. | [U]/ [CO3] |

(5×4= 20)

Part C

Essay

Answer any **1** question

Each question carries **10** marks

- | | |
|--|------------|
| 20. Explain the molecular regulation of the cycle and the importance of checkpoints. | [K]/ [CO1] |
| 21. Explain linkage and crossing over. | [U]/ [CO3] |

(1×10= 10)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) REGULAR EXAMINATION NOVEMBER 2025
THIRD SEMESTER
Discipline Specific Elective course (DSE B) –MG3DSEBBT202
PLANT AND ANIMAL PHYSIOLOGY
(2024 ADMISSION ONWARDS)

Duration : 2 Hours

Maximum Marks : 70

Remember (K), Understanding (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skills (S), Interest (I) and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

PART A

One Word Answer

Answer any **10**

Each question carries **2** marks

- 1.The chronic condition characterized by inflammation of the airways [K] / [CO 1]
- 2.Name the organs present in the dorsal body cavity. [K] / [CO 1]
- 3.The location of the adrenal glands with reference to the kidneys. [U] / [CO 1]
4. List out three stress hormones in plants. [K] / [CO 3]
- 5.List out the two essential processes that work together to breakdown food into usable nutrients and move them to blood stream. [K] / [CO 1]
6. What is known for the relative volume of formed elements in the blood? [K] / [CO 1]
- 7.The condition where plaque builds up in the arteries, leading to heart disease. [K] / [CO 1]
- 8.Plant hormone which promotes cell division and cell elongation. [U] / [CO 4]
- 9.Name any two treatment methods for neurological disorders. [K] [CO 2]
- 10.Expand EEG. [K] / [CO 2]
- 11.Name the environmental factors affecting plants. [U] / [CO 3]
- 12.What are the crop improvement methods? [K] / [CO 4]

(2 x 10 = 20)

PART B

Short Essay

Answer any **4** questions

Each question carries **5** marks

13. Explain the mechanism of transportation in plants. [U] / [CO 3]
14. How does the body regulate blood glucose level? [K] / [CO 1]
15. Discuss on the types of essential elements for plants. [U] / [CO 3]
16. How do white blood cells help the body to fight infections? [K] / [CO 1]
17. Describe on how the human physiology helps in the diagnosis of diseases. [U] / [CO 2]
18. Explain the defense mechanism in plants. [U] / [CO 4]

(5 x 4 = 20)

PART C

Essay

Answer any **2** questions

Each question carries **15** marks

19. Compare and contrast the mechanisms of photoperiodism and vernalization and the response of hormones in plants. [U]/[CO3]

20. Summarize how the plant physiology helps in crop improvement and plant breeding [U] / [CO 4]

21. Interpret the role of neurotransmitters in transmitting signals across synapses [U] / [CO 1]

22. Describe the different types of plant movements. [R] / [CO3]

(2 x 15 =30)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) REGULAR EXAMINATION NOVEMBER 2025
THIRD SEMESTER

Value Added Course (VAC) - MG3VACBBT201- Environmental Biotechnology and Human Rights
(2024 ADMISSION ONWARDS)

Duration: 1.5 Hours

Maximum Marks: 50

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A - One word answer - Answer any 10 questions. Each question carries 2 marks(10x2:20)

1. Name one environmental law in India? [K] / [CO3]
2. What is the term for the disposal of solid waste in a controlled manner? [K] / [CO3]
3. Name one method of biological wastewater treatment. [K] / [CO3]
4. What is the term for the living components of an ecosystem? [K] / [CO1]
5. What does Article 21 of the Indian Constitution protect? [U] / [CO4]
6. Name one nonrenewable energy resource. [K] / [CO1]
7. What is the universal declaration associated with human rights called? [K] / [CO4]
8. What is the primary source of energy in an ecosystem? [K] / [CO1]
9. Name one bacterium tested in drinking water analysis. [K] / [CO2]
10. What cycle involves the fixation of atmospheric nitrogen? [K] / [CO1]
11. Name one UN body coordinating human rights. [K] / [CO4]
12. What type of energy resource is solar power? [K] / [CO1]

Part B- Short essay- Answer any 5 questions. Each question carries 4 marks (5x4:20)

13. Identify a predator in a food web. [K] / [CO1]
14. Name two solid waste management techniques. [K] / [CO3]
15. How do microorganisms aid biodegradation? [U] / [CO2]
16. Name two biotic components of an ecosystem. [K] / [CO1]
17. Describe the significance of E. coli in water testing. [U] / [CO2]
18. Why is recycling important in solid waste management? [U] / [CO3]
19. List two UN human rights bodies. [K] / [CO4]

Part C- Essay- Answer any 1 question. Each question carries 10 marks (10x1:10)

20. Describe the structure and components of an ecosystem, including both biotic and abiotic factors. [K] / [CO1]
21. Explain wastewater treatment process. [U] / [CO3]

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MAHATHMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) REGULAR EXAMINATION NOVEMBER 2025
THIRD SEMESTER
DSC A- MG3DSCBTG200- BIOPHYSICS AND INSTRUMENTATION
(2024 ADMISSION ONWARDS)

Duration: 1½

Maximum Marks: 50

**Remember(K), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create(C), Skill(S), Interest(I) and
Appreciation (Ap)**

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Answer any **10** questions

Each question carries **2** marks

(10×2= 20)

- | | |
|---|------------|
| 1. Define enthalpy | [K]/ [CO1] |
| 2. Name the laws of thermodynamics. | [U]/ [CO3] |
| 3. What is Osmosis? | [U]/ [CO2] |
| 4. Which law is applied in the working of colorimeter? | [K]/ [CO3] |
| 5. Which bond is formed between amino acids in a protein? | [K]/ [CO3] |
| 6. Name the different structural forms of DNA? | [U]/ [CO2] |
| 7. Define radioactivity.? | [K]/ [CO2] |
| 8. Name the parts of a compound microscope. | [K]/ [CO1] |
| 9. State the principle of ion exchange chromatography. | [U]/ [CO1] |
| 10. Define Biosensors. | [K]/ [CO2] |
| 11. Who invented the electrophoresis technique? | [K]/ [CO2] |
| 12. State the principle of HPLC. | [U]/ [CO3] |

Part B

Answer any **5** questions

Each question carries 4 marks

(5×4= 20)

- | | |
|--|-------------|
| 13. Describe the structure and components of electron microscope. | [K]/ [CO1] |
| 14. Explain the Laws of Thermodynamics. | [K]/ [CO1] |
| 15. Compare and Contrast SEM and TEM. | [An]/ [CO2] |
| 16. Describe the principle and applications of biosensors. | [A]/ [CO2] |
| 17. Explain the applications of autoradiography in molecular biology. | [A]/[CO3] |
| 18. Describe the role of water in living organisms. | [K]/ [CO3] |
| 19. Define polarization and Interference of light. Mention its significance in microscopy. | [U]/ [CO3] |

Part C

Answer any **1** question

Each question carries **10** marks

(1×10= 10)

- | | |
|--|------------|
| 20. Describe the principle, construction, working and applications of GM counter. | [K]/ [CO1] |
| 21. Explain the formation of peptide bonds and the significance of the Ramachandran plot in understanding protein structure. | [U]/[CO3] |

MAHATMAGANDHIUNIVERSITY,KOTTAYAM
MGU-UGP(HONOURS) REGULAR EXAMINATION NOVEMBER 2025

THIRD SEMESTER
Discipline Specific Elective (DSE)-MG3DSEBBT201 - Developmental Biology and Assisted
Reproduction Technology
(2024ADMISSION ONWARDS)

Duration: 2 Hours

Maximum Marks: 70

Remember(K),Understand(U),Apply(A),Analyse(An),Evaluate(E),Create(C),Skill (S), Interest (I)
and Appreciation (Ap)

Students should attempt atleast one question from each course outcome to enhance their overall outcome attainability.

Part A- One word answer-Answer any10 questions. Each question carries 2 marks

- | | |
|---|----------|
| 1. What are the two primary functions of male gonad? | [K]/CO1 |
| 2. Name any two hormones produced by ovary. | [K]/CO1 |
| 3. List out any two examples of types of egg based on the amount of yolk. | [K]/CO1 |
| 4. Which muscles contract during childbirth? | [U]/CO2 |
| 5. Which placental hormone maintains the endometrium? | [U]/CO2 |
| 6. What are the first two stages of parturition? | [U]/CO2 |
| 7. List out any two morphogenetic movements | [U]/CO3 |
| 8. Write two Examples of organisms with meroblastic cleavage? | [U]/CO3 |
| 9. Which type of cleavage occurs in humans? | [U]/CO3 |
| 10. Write the expansion of IVF. | [An]/CO4 |
| 11. Write any two techniques used for Prenatal Diagnosis | [U]/CO4 |
| 12. What is the 16-cell stage called in embryo development? | [K]/CO2 |

(10 x 2 = 20)

Part B-Short essay-Answer any 4 questions. Each question carries 5 marks

- | | |
|---|----------|
| 13. Name the different types of eggs based on yolk and define each briefly | [K]/CO1 |
| 14. Describe a diagram showing the process of oogenesis with its stages | [K]/CO1 |
| 15. What is ectopic pregnancy? Name two sites where it may occur | [K]/CO2 |
| 16. Describe the term polyspermy and how it is prevented in humans | [U]/CO2 |
| 17. Classify morphogenetic movements with suitable examples | [U]/CO3 |
| 18. Discuss the emotional and ethical concerns involved in prenatal diagnosis | [An]/CO4 |

(4 x 5 = 20)

Part C-Essay-Answer any 2 questions. Each question carries 15 marks

19. Analyze the role of FSH, LH, estrogen, and progesterone in regulating the female reproductive cycle
[K]/CO1
20. Describe the development and functions of the placenta in supporting pregnancy [U]/CO2
21. Show the sequential developmental stages from cleavage to germ layer formation using labeled diagrams and a flowchart [U]/CO3
22. Explain a detailed diagrammatic representation showing the steps of IVF and embryo transfer
[U/CO4]

(2X15=30)