

BBCCT-103: Cell Biology

Course Code	BBCCT-103
Course Title / Subject	Cell Biology
Programme	Undergraduate Honours / CBCS
Medium	English Medium
Marks	100
Assignment Type	Tutor Marked Assignment (TMA)

This reference solution is prepared in clear, professional academic language for direct handwritten assignment practice.

Official IGNOU Assignment / Syllabus Question Paper

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Assignment Cell Biology

Course Code: **BBCCT-103**

Assignment code: **BBCCT-103/TMA/2026**

Maximum marks: **100**

Note: Attempt all questions.

1. (a) Describe any two types of extremophiles and the environmental conditions they inhabit. (5)
(b) What are experimental models? Give any two examples along with their specific features. (5)
2. (a) Describe the ultrastructure of a typical plant cell with the help of a labeled diagram. (5)
(b) Compare transmission electron microscopy and light microscopy. (5)
3. (a) Explain the principle and applications of confocal microscopy. (5)
(b) Discuss the importance of fixation and staining techniques in cell biology. (5)
4. (a) Explain the steps involved in subcellular fractionation. (5)
(b) Describe the structure and functions of chloroplast. (5)
5. Write short notes on the following: (5+5)
(a) Plasmodesmata
(b) Microtubules
6. Explain the signal hypothesis. Outline the common characteristics of signal sequences involved in protein targeting. (10)
7. (a) Differentiate between O-glycosylation and N-glycosylation. (5)
(b) Explain the Ran GTP/GDP Cycle. (5)
8. Describe the protein transport pathways into the thylakoid lumen with a neat labeled diagram. (10)
9. (a) Discuss the different sub-phases of prophase I in Meiosis. (5)
(b) Explain the role of cyclins and cyclin-dependent kinases in regulation of cell cycle. (5)
10. Describe any two of the following: (5+5)
(a) Major players in Apoptosis
(b) Necrosis
(c) Fluorescence-Activated Cell Sorting (FACS)

Solved Answers

Answer 1: Write your Enrolment Number, Name, Full Address, Signature and Date on the top right hand corner of the first page of your response sheet. Study Centre on the left hand corner of the first page of your response sheet. The top of the first page of your response sheet should look like this: ENROLMENT NO.: PROGRAMME TITLE :

..... **NAME:**
COURSE TITLE : **STUDY CENTRE :**
..... **DATE:** (ignoucollage.in)

About 500 words

The study and understanding of **write your enrolment number, name, full address, signature and date on the** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **write your enrolment number, name, full address, signature and date on the** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

Furthermore, evaluating the procedural and developmental progression of **write your enrolment number, name, full address, signature and date on the** provides deeper insight into its overall significance. When applied to specific cases or experimental situations, researchers observe a distinct sequence of causes and effects. Whether analyzing social structures, historical shifts, economic behavior, literary expression, or scientific phenomena, maintaining methodological precision at every phase is critical. Rigorous analysis prevents misinterpretation and ensures that comparative evaluations yield valid, repeatable conclusions.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **write your enrolment number, name, full address, signature and date on the** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **write your enrolment number, name, full address, signature and date on the** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 2: (a) Describe any two types of extremophiles and the environmental conditions they inhabit. (b) What are experimental models? Give any two examples along with their specific features. (ignoucollage.in)

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Answer 3: (a) Describe the ultrastructure of a typical plant cell with the help of a labeled diagram. (b) Compare transmission electron microscopy and light microscopy. (ignoucollage.in)

About 500 words

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Answer 4: (a) Explain the principle and applications of confocal microscopy. (b) Discuss the importance of fixation and staining techniques in cell biology. (ignoucollage.in)

About 500 words

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Answer 5: (a) Explain the steps involved in subcellular fractionation. (b) Describe the structure and functions of chloroplast. (ignoucollage.in)

About 500 words

The study and understanding of **(a) explain the steps involved in subcellular fractionation. (b) describe the structure** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

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Answer 6: Write short notes on the following: (5+5) (a) Plasmodesmata (b) Microtubules (ignoucollage.in)

About 500 words

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Answer 7: Explain the signal hypothesis. Outline the common characteristics of signal sequences involved in protein targeting. (ignoucollage.in)

About 500 words

The study and understanding of **signal hypothesis. outline the common characteristics of signal sequences involved in protein** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

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Answer 8: (a) Differentiate between O-glycosylation and N-glycosylation. (b) Explain the Ran GTP/GDP Cycle. (ignoucollage.in)

About 500 words

The study and understanding of **(a) differentiate between o-glycosylation and n-glycosylation. (b) explain the ran gtp/gdp cycle** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories

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Answer 9: Describe the protein transport pathways into the thylakoid lumen with a neat labeled diagram. (ignoucollage.in)

About 500 words

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Answer 10: (a) Discuss the different sub-phases of prophase I in Meiosis. (b) Explain the role of cyclins and cyclin-dependent kinases in regulation of cell cycle. (ignoucollage.in)

About 500 words

The study and understanding of **(a) discuss the different sub-phases of prophase i in meiosis. (b) explain** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

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