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PB—08—2024

FACULTY OF SCIENCE

B.Sc. (Second Year) (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Advanced Cell Biology)

(Thursday, 04-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

Note *:—* (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw neat diagrams wherever necessary.

1. Explain in brief structural organization of prokaryotes. 15

Or

(*a*) Describe in detail cell theory. 8

(*b*) Write a note on plant cell. 7

2. Describe in detail structure and function of mitochondria. 15

Or

(*a*) Write a note on microtubules. 8

(*b*) Explain structure and functions of Golgi apparatus. 7

3. Explain in detail phagocytosis. Add a note on pinocytosis. 15

Or

(*a*) Write a note on simple diffusion. 8

(*b*) Describe in detail osmosis. 7

4. Describe in detail meiosis. 15

Or

(*a*) Explain in brief gap junction. 8

(*b*) Write a note on G-protein coupled receptor. 7

5. Write notes on (any *three*) : 15

(*a*) Prokaryotes

(*b*) Chloroplast

(*c*) Endocytosis

(*d*) Plasmodesmata

(*e*) Introduction of Cancer Biology.

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PB—21—2024

FACULTY OF SCIENCE

B.Sc. (Second Year) (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Bioinstrumentation Techniques)

(Wednesday, 10-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

Note *:—* (*i*) *All* questions are compulsory.

(*ii*) Each question carries equal marks.

(*iii*) Draw a well labelled diagram wherever necessary.

1. Describe in detail compound microscope with advantages and disadvantages. 15

Or

(*a*) SEM 8

(*b*) Basic law of absorption. 7

2. Write a detailed note on ion exchange chromatography. 15

Or

(*a*) Write a note on TLC. 8

(*b*) Write a note on paper chromatography. 7

3. Describe in detail types of rotor with its advantages. 15

Or

(*a*) Basic principle of centrifugation. 8

(*b*) Centrifugal force. 7

4. What is electrophoresis ? Describe pulse field gel electrophoresis. 15

Or

(*a*) Agarose gel electrophoresis. 8

(*b*) Factors affecting on electrophoresis mobility. 7

5. Write short notes on (any *three*) : 15

(*i*) Phase contrast microscope

(*ii*) Column chromatography

(*iii*) Types of centrifuges

(*iv*) PAGE.

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PB—03—2024

FACULTY OF SCIENCE

B.Sc. (Second Year) (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Metabolism)

(Tuesday, 02-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

Note *:—* (*i*) Attempt *all* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Represent your answers with well labelled diagrams and pathways.

1. Describe in detail dark reactions of photosynthesis. 15

Or

Write notes on :

(*a*) C_2 Pathway 8

(*b*) Components of photosynthesis. 7

2. Describe in detail TCA cycle. 15

Or

(*a*) Explain glycolysis pathway. 8

(*b*) Explain ETC. 7

3. Describe in detail β-oxidation of polyunsaturated fatty acid with example. 15

Or

(*a*) Explain β-oxidation of saturated fatty acid. 8

(*b*) Write a note on urea cycle. 7

4. Describe in detail synthesis of saturated fatty acid. 15

Or

(*a*) Explain regulation of fatty acid synthesis. 8

(*b*) Explain mitochondrial chain elongation. 7

5. Write short notes on (any *three*) : 15

(*a*) C_4 pathway

(*b*) Anaerobic respiration

(*c*) Inhibitors of ETC

(*d*) Carnitine Shuttle

(*e*) Transamination of amino acids.

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PB—14—2024

FACULTY OF SCIENCE

B.Sc. (Second Year) (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Molecular Biology)

(Saturday, 06-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

Note *:—* (*i*) *All* questions are compulsory.

(*ii*) Each question carries equal marks.

1. Describe in detail steps involved in prokaryotic DNA replication. 15

Or

(*a*) Describe in detail Watson and Crick's model of DNA. 8

(*b*) Explain in detail Direct DNA repair. 7

2. Explain in detail prokaryotic transcription. 15

Or

(*a*) Describe in detail Eukaryotic initiation mechanism in transcription. 8

(*b*) Explain the process of intensplicity and poly-adenylation. 7

3. Explain in detail mechanism of Eukaryotic translation. 15

Or

(*a*) Explain in brief role of *m*RNA, *t*RNA and *r*RNA. 8

(*b*) Explain in brief process of protein folding and add a note on glycosylation. 7

4. Explain in detail tryprophan operon. 15

Or

(*a*) Describe in detail positive regulation of lactose operon. 8

(*b*) Explain various properties of genetic code. 7

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

(*i*) DNA Polymerase

(*ii*) SOS Repair

(*iii*) 5$^{\perp}$ Capping

(*iv*) Proteolytic processing in proteins

(*v*) Negative regulation of lac operon.

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PB—22—2024

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc. (Second Year) (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–DSEBT–4CII

(Plant Physiology)

(Wednesday, 10-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) Attempt *all* questions.

(*ii*) Figures to the right indicate full marks.

(*iii*) Illustrate your answers with suitable diagram, scheme etc.

1. Give an account of the importance and significance of water in plant physiology. 15

Or

(*a*) Describe pressure flow theory. 8

(*b*) Give the composition of phloem sap. 7

2. Describe ultra-structure of Chloroplast and functions. 15

Or

(*a*) Describe photosynthetic pigments. 8

(*b*) Give salient features of C4 plants. 7

3. Describe ultra-structure of mitochondria and functions. 15

Or

(*a*) Describe glycolysis 8

(*b*) Describe ETC 7

4. Give an account of different types of stresses in plants. 15

Or

(*a*) Describe Auxin and Cytokinin 8

(*b*) Describe xenobiotic 7

5. Write notes on any *three* : 15

(*i*) Ethylene

(*ii*) Fermentation

(*iii*) ATP Synthesis

(*iv*) Path of carbon in photosynthesis

(*v*) Transpiration.