

3 Yr. Degree/4 Yr. Honours 3rd Semester Examination, 2024 (under CCFUP of NEP 2020)

Time: 2 Hours

Subject : BIOTECHNOLOGY

Full Marks: 40

Course: Multi/Interdisciplinary

Course Code : BIOT3031(MDC/IDC) Course Title : Scope of
Biotechnology

Roll No.: Registration No. of 20

INSTRUCTIONS TO THE EXAMINEE

1. The Question-cum-Answer Booklet comprised of 40 Questions and each Question carrying 1 (one) mark.
2. Each Question possesses 4 (four) Answer Options (A), (B), (C) and (D) of which only one option bears Correct Answer.
3. Completely darken the respective circle for your response as shown below—
Correct method ● Wrong method (✓) (✗) (◐)
4. Each Correct Answer will be credited with 1 (One) Mark.
5. If an Examinee attempts more than one Option for a Question, the attempt will be considered as WRONG Answer.
6. No Mark will be deducted for attempting Wrong Answer or Incorrect attempts.
7. Only Blue/Black Ink Pen is to be used for Answering Question.
8. No Electronic Gadget (Calculator, Mobile Phone, Laptop, I-Pad, Camera etc.), Papers (Other than Admit Card) will be allowed inside the Examination Hall.
9. No Loose sheet will be provided for scribbling and No Paper is to be brought in this purpose. Any Examinee found with incriminating Documents in his/her possession— he/she will be Expelled.
10. All rough work must be done in the page provided in the Question-Answer-Booklet, and the said Page of the Booklet **must not be torn out.**
11. No Examinee will be allowed to leave the Examination Hall until an Hour has elapsed from the commencement of the Examination.
12. As per order of the Executive Council all Answer Scripts will be preserved for one year from the date of Publication of Results.

১. Question-cum-Answer Booklet-এ মোট ৪০টি প্রশ্ন আছে এবং প্রতিটি প্রশ্নের মান ১ (এক)।
২. প্রতিটি প্রশ্নের জন্য ৪ (চার)টি করে Option (A), (B), (C) এবং (D) থাকবে, এর মধ্যে একটি সঠিক উত্তর নির্দেশ করবে।
৩. সঠিক উত্তরের জন্য নির্দিষ্ট বৃত্তটিকে সম্পূর্ণ রূপে কালো করতে হবে তা নীচে দেখানো হল—
সঠিক পদ্ধতি ● ভুল পদ্ধতি (✓) (✗) (◐)
৪. প্রতিটি সঠিক উত্তরের মান ১ (এক)।
৫. যদি কোনো পরীক্ষার্থী একটি প্রশ্নের একাধিক উত্তর দেয় তাহলে সেটি ভুল উত্তর হিসেবে গণ্য হবে।
৬. ভুল উত্তরের জন্য কোনো নম্বর বাদ যাবে না।
৭. উত্তর লেখার জন্য কেবলমাত্র নীল অথবা কালো কালির কলম ব্যবহার করা যাবে।
৮. পরীক্ষাকেন্দ্রের মধ্যে হেল্পিং লেকট্রনিক্স যন্ত্রাদি (ক্যালকুলেটর, মোবাইল ফোন, ল্যাপটপ, আই-প্যাড, ক্যামেরা ইত্যাদি), ক্যাডমিট কার্ড (অ্যাডমিট কার্ড) নিয়ে প্রবেশ নিষিদ্ধ।
৯. হিজিবিজি বা রাফ লেখা বাড়াই কাগজ দেওয়া যাবে না এবং এই উদ্দেশ্যে কোনো কাগজ আনা যাবে না। কোনো পরীক্ষার্থী নাগে নকল-এর মতো অপরাধমূলক কাগজ পাওয়া গেলে সেই ছাত্র/ছাত্রীকে বহিষ্কার করা হবে।
১০. সমস্ত 'রাফ ওয়ার্ক' প্রশ্ন-উত্তর-সংস্কার সঙ্গে থাকা নির্দিষ্ট পাতাতেই করতে হবে এবং উত্তরপত্র জমা দেবার সময় পাতাটি ছিঁড়ে নেওয়া যাবে না।
১১. পরীক্ষা শুরু থেকে এক ঘণ্টা সময় অতিবাহিত না হলে কোনো পরীক্ষার্থী পরীক্ষার হল থেকে বের হতে পারবে না।
১২. বিশ্ববিদ্যালয় কর্মসূচি অনুসারে গৃহীত সিদ্ধান্ত অনুসারে পরীক্ষার ফল প্রকাশের ক এক বছরের জন্য উত্তরপত্র সংরক্ষিত থাকবে।



1. Which of the following is a common application of agricultural biotechnology?

- ☒ (A) Genetic modification of crops for increased yield
- (B) Crop rotation methods
- (C) Pest control using chemical pesticides
- (D) Soil erosion prevention techniques

2. Locating and identifying agriculturally important genes is called _____.

- (A) Immobilization
- (B) Gene therapy
- (C) Gene regulation
- ☒ (D) Gene identification

3. What is the primary goal of agricultural biotechnology?

- ☒ (A) To enhance agricultural productivity and sustainability
- (B) To increase crop diversity
- (C) To develop soil with improved fertility
- (D) To reduce the use of chemical fertilizers

4. Who defined biotechnology as the application of biological organisms, system or processes to manufacturing and service industries?

- (A) Japanese biotechnologists
- (B) US National Science Foundation
- (C) British biotechnologists
- ☒ (D) European Federation of Biotechnology

5. What is the biotechnology involving new approaches to plant pest control called?

- (A) Biotechnology
- ☒ (B) Microbial agro-biotechnology
- (C) Livestock biotechnology
- (D) Marine biotechnology

6. Which type of cloning is related to monoclonal antibody technology?

- (A) Animal cloning
- (B) Plant cloning
- ☒ (C) Cellular cloning
- (D) Molecular cloning

7. What is the bacterium from which glyphosate-resistance gene was isolated?

- ☒ (A) *Salmonella typhimurium*
- (B) *Staph aureus*
- (C) *Treponema pallidum*
- (D) *Borrelia afzelii*

8. Which is the compound that makes wood resistant to degradation?

- (A) Chlorophyll
- (B) Cellulose
- ☒ (C) Lignin
- (D) Timber

9. Penicillin was discovered by

- (A) Lui Pasteur
- (B) Robbert Koch
- (C) Selman Waxman
- ☒ (D) Alexander Fleming

10. Which of these is a gymnosperm?

- (A) Cotton
- ☒ (B) White spruce
- (C) Pear
- (D) Lotus

11. Which is the herbicide detoxified by nitrilase?

- (A) Atrazine
- (B) Imidazolinones
- (C) Glyphosate
- ☒ (D) Bromoxynil

12. Which of the following techniques is commonly used in genetic engineering for enhancing nitrogen fixation in plants?

- (A) Polymerase Chain Reaction (PCR)
- (B) Southern blotting
- ☒ (C) CRISPR-Cas9
- (D) RNA interference (RNAi)

13. Which of these enzymes helps in end to end joining of DNA duplexes?

- ☒ (A) T4 polynucleotide ligase
- (B) Transferase
- (C) Ribonuclease
- (D) Cellulase

14. Which of the following is not an application of plasmid?

- (A) Transfer of genes
- (B) Cloning
- ☒ (C) Destroying organisms
- (D) Manipulation of genes

15. Which of these is possible in cloning vectors themselves?

- (A) Production of gene
- ☒ (B) Storing of genetic sequence
- (C) Translation of gene
- (D) Transcription of gene

16. What are the main components of bacteriophage?

- (A) Proteins and Lipids
- (B) Carbohydrates and Lipids
- (C) Proteins and Carbohydrates
- ☒ (D) Nucleic acids and Proteins

17. The foundation for the development of cell culture technique was laid by

- (A) Roux.
- (B) Arnold.
- (C) Ross.
- ☒ (D) Harrison.

18. Who is regarded as the father of tissue culture?

- ☒ (A) Haberlandt
- (B) Arnold
- (C) Ross
- (D) Roux

19. The limited replicative capacity of human cells in culture is called

- ☒ (A) Hayflick effect.
- (B) Brownian effect.
- (C) Contact inhibition.
- (D) None of the above

20. HAT medium used for the selection of fused hybrid cells in hybridoma culture was introduced by

- ☒ (A) Littlefield and Miller.
- (B) Kohler and Milstein.
- (C) Frish and Jentoft.
- (D) Eagle and Karl.

21. Which of the following is HGPRT⁺ and survives in HAT medium?

- (A) B cells
- (B) Myeloma cells
- (C) Hybrid cells
- ☒ (D) Both (A) and (C)

22. Use of trypsin to free cells from tissue matrix for cell culture was described by

- (A) Jolly and Koch.
- (B) Beebe and Ewing.
- ☒ (C) Rous and Jones.
- (D) Gottlieb Maberland.

23. Cells used in feeder layer—

- (A) Should have ability to divide
- (B) Have ability to metabolize
- (C) These properties are obtained by exposing cells to irradiation
- ☒ (D) All of the above

24. Cell culture technique became simpler only after advent of

- (A) Antibiotics.
- (B) Trypsin.
- (C) Cell culture media.
- ☒ (D) All of the following.

25. Which of the following is true regarding animal cell culture technique?

- (A) Lactic acid is source of carbon.
- (B) Cells have high requirement of L-glutamine.
- (C) Cholin is necessary for cell adhesion and cytoskeleton.
- ☒ (D) All of the following

26. Which of the following is the structural fibre in cell culture system?

- (A) Collagen
- (B) Elastin
- (C) Fibronectin
- ☒ (D) Both (A) and (B)

27. Optimum pH required for the growth of mamalian cells is

- (A) 5.3–7.0
- (B) 6.5–7.0
- ☒ (C) 7.2–7.4
- (D) 8.1–8.9

28. The optimum temperature of any cell or organ is called

- (A) Critical temperature.
- (B) Threshold temperature.
- ☒ (C) Ceiling temperature.
- (D) None of the above

29. For culture of avian cells the optimum temperature requirement is

- (A) 37 °C
- ☒ (B) 38.5 °C
- (C) 42 °C
- (D) 35 °C

30. Which of the following is the oldest cell line?

- ☒ (A) HeLa cell line
- (B) Vero cell line
- (C) CHO cell line
- (D) BHK cell line

31. Which cell line is used for production of recombinant sex hormones?

- (A) BHK cell line
- (B) Vero cell line
- (C) Hela cell line
- ✓ (D) CHO cell line

32. The ratio of CO_2 : O_2 used in cell culture system should be

- (A) 1 : 5
- (B) 1 : 13
- ✓ (C) 1 : 19
- (D) 1 : 25

33. Which of the following is most commonly used cell fusing agent?

- ✓ (A) PEG
- (B) NaNO_3
- (C) Sendai virus
- (D) Polyvinyl alcohol

34. Which of the following virus is used for cell fusion?

- ✓ (A) Sendai virus
- (B) AIDS virus
- (C) Influenza virus
- (D) All of the following

35. Which of the following is easy and rapid method to interpret viability of cells in culture system?

- ✓ (A) Trypan blue dye exclusion
- (B) Neutral red assay
- (C) Fluorescein dye assay
- (D) All of the following

36. What is the primary function of restriction enzymes in biotechnology?

- (A) DNA ligation
- (B) DNA replication
- (C) DNA transcription
- ✓ (D) DNA fragmentation

37. Which technique is used to separate and analyze DNA fragments based on their size in biotechnology?

- ✓ (A) Gel electrophoresis
- (B) DNA sequencing
- (C) Southern blotting
- (D) Polymerase chain reaction (PCR)

38. What gives shape to the plant or microbial cells?

- (A) Cytoplasm
- ✓ (B) Exoskeleton
- (C) Nuclear membrane
- (D) Nucleus

39. Which among the following is not a fermentation technology product?

- ✓ (A) Coffee
- (B) Soya sauce
- (C) Sauerkraut
- (D) Cheese

40. What includes procedures to allow detection and isolation of microbes of interest?

- (A) Centrifuging
- (B) Precipitation
- ✓ (C) Screening
- (D) Mashing