CUET MCQ Questions from UNIT 4 (1)

1. **Genetic engineering involves:**
   A. Manipulating the physical structure of organisms
   B. Altering the genetic material of organisms
   C. Controlling the environment of organisms
   D. Changing protein sequences directly

2. **Which of the following is a key tool in recombinant DNA technology?**
   A. Centrifuge
   B. Restriction enzyme
   C. Spectrophotometer
   D. Chromatograph

3. **The first step in recombinant DNA technology is:**
   A. DNA isolation
   B. Cloning
   C. Gene transfer
   D. Protein synthesis.

4. **In genetic engineering, vectors are used to:**
   A. Replicate cells
   B. Transport genes into host cells
   C. Produce proteins
   D. Clone organisms

5. **DNA ligase is crucial for:**
   A. Cutting DNA
   B. Amplifying DNA
   C. Joining DNA fragments
   D. Sequencing DNA

6. **The polymerase chain reaction (PCR) is used for:**
   A. DNA replication in vivo
   B. Amplifying DNA in vitro
   C. Protein synthesis
   D. RNA translation

7. **A common host organism used in genetic engineering is:**
   A. E. coli

B. Bacillus
C. Saccharomyces
D. Clostridium

8. Restriction enzymes are derived from:
A. Plants
B. Viruses
C. Bacteria
D. Fungi

9. Golden Rice is an example of:
A. Hybridization
B. A genetically modified organism (GMO)
C. Tissue culture
D. Conventional breeding

10. Gel electrophoresis is used for:
A. DNA isolation
B. Separating DNA fragments by size
C. Protein synthesis
D. Gene transfer

11. The first recombinant DNA product was:
A. Insulin
B. Human growth hormone
C. Interferon
D. Penicillin

12. Plasmids in recombinant DNA technology act as:
A. Enzymes
B. Vectors
C. Proteins
D. Membranes

13. Agrobacterium tumefaciens is commonly used to transfer genes into:
A. Bacteria
B. Animals
C. Plants
D. Fungi

14. Restriction enzymes recognize:

A. Random sequences
B. Palindromic sequences
C. RNA primers
D. Repetitive sequence.

15. Ti plasmid is used for:

A. Protein synthesis
B. Gene editing in animals
C. Genetic modification in plants
D. DNA isolation

16. In genetic engineering, transformation refers to:

A. Cloning of DNA
B. Introducing foreign DNA into a host cell
C. Separating DNA fragments
D. Amplifying RNA

17. Sticky ends in DNA are formed by:

A. DNA ligase
B. Restriction enzymes
C. RNA polymerase
D. Helicase

18. The enzyme used in PCR to synthesize DNA is:

A. RNA polymerase
B. DNA polymerase
C. Taq polymerase
D. Ligase

19. The gene gun method is primarily used for:

A. Bacteria
B. Fungi
C. Plants
D. Viruses.

20. Complementary DNA (cDNA) is synthesized from:

A. RNA
B. DNA
C. Proteins

D. Lipids

21. A GMO is an organism that:

A. Has altered metabolic pathways
B. Contains foreign DNA
C. Is resistant to diseases
D. Produces extra proteins

22. Bt cotton is genetically engineered to:

A. Resist herbicides
B. Produce insecticidal proteins
C. Increase water retention
D. Enhance fiber quality

23. In vectors, antibiotic resistance genes are used for:

A. Enhancing growth
B. Selecting transformed cells
C. Producing proteins
D. Eliminating mutations

24. The steps in PCR are:

A. Denaturation, annealing, extension
B. Transcription, translation, replication
C. Isolation, amplification, cloning
D. Ligation, transformation, selection

25. A genomic library contains:

A. All expressed genes
B. All mRNA molecules
C. Entire genome fragments
D. Only coding regions of DNA

26. A major ethical concern of genetic engineering is:

A. High cost
B. Environmental impact
C. Alteration of natural species
D. Use of complex tools

27. The primary goal of the Human Genome Project was to:

A. Create new proteins

B. Map all human genes
C. Clone humans
D. Develop vaccines

28. RNA interference (RNAi) is used in genetic engineering to:
A. Increase protein synthesis
B. Silence specific genes
C. Replace faulty DNA
D. Repair DNA damage

29. Bioreactors are used for:
A. Cloning organisms
B. Large-scale protein production
C. Gene editing
D. DNA sequencing

30. Gene therapy involves:
A. Cloning organisms
B. Introducing healthy genes to treat diseases
C. Vaccinating against pathogens
D. Modifying proteins

31. A genetically modified organism (GMO) is an organism whose genetic material has been:
A. Naturally evolved
B. Artificially modified
C. Mutated due to radiation
D. Crossbred with other species

32. In Bt crops, "Bt" stands for:
A. Biotech technology
B. Bacillus thuringiensis
C. Biological toxin
D. Biotechnology term

33. Which of the following is a genetically modified Bt crop?
A. Bt Cotton
B. Golden Rice
C. Hybrid Maize
D. Organic Wheat

34. A transgenic animal is created by:

A. Selective breeding
B. Genetic engineering
C. Cloning
D. Natural mutation

35. The primary purpose of Bt crops is to:

A. Increase growth rate
B. Resist pests
C. Enhance flavor
D. Tolerate herbicides

36. Biosafety concerns about GMOs include:

A. Allergies
B. Loss of biodiversity
C. Gene transfer to wild relatives
D. All of the above

37. Which of these is a transgenic animal?

A. Dolly the Sheep
B. GloFish
C. Zebrafish
D. Clydesdale Horse

38. Biopiracy refers to:

A. Illegal poaching of animals
B. Unauthorized use of biological resources
C. Theft of genetic material
D. Both B and C

39. Golden rice is genetically modified to combat:

A. Iron deficiency
B. Vitamin A deficiency
C. Protein deficiency
D. Caloric deficiency

40. A patent in biotechnology grants:

A. Ownership of biological organisms
B. Exclusive rights to an invention

C. Universal use of technology
D. Access to natural resources

41. GMOs designed for herbicide tolerance allow:
A. Enhanced photosynthesis
B. Resistance to pests
C. Survival after herbicide application
D. Increased water absorption

42. Aqu Advantage Salmon grows faster due to:
A. Enhanced diet
B. Genetic modification
C. Warmer water habitats
D. Crossbreeding with larger fish

43. Transgenic animals are created for:
A. Studying diseases
B. Producing pharmaceuticals
C. Enhancing food production
D. All of the above

44. The Cartagena Protocol focuses on:
A. Food security
B. Biosafety of GMOs
C. Wildlife conservation
D. Industrial pollution

45. Patents on GMOs raise ethical issues because:
A. They increase costs for farmers
B. Limit access to technology
C. Exploit indigenous knowledge
D. All of the above

46. The toxin produced by Bt crops affects:
A. Humans
B. Beneficial insects
C. Specific pests
D. All organisms

47. The first genetically modified crop approved for commercial production was:

A. Bt Cotton
B. Golden Rice
C. Flavr Savr Tomato
D. GM Soybean

48. One major biosafety concern regarding GMOs is:
A. Improved crop yield
B. Insect resistance development
C. Increased food production
D. Lower pesticide use

49. Bt cotton is genetically modified to protect against:
A. Leaf rust
B. Root nematodes
C. Bollworms
D. Aphids

50. Cry genes in Bt crops encode:
A. Enzymes
B. Pest-resistant proteins
C. Growth hormones
D. Herbicides

CUET MCQ Questions from UNIT 4 (2)

1. **Human insulin produced using recombinant DNA technology is called:**
   A. Synthetic insulin
   B. Recombinant insulin
   C. Natural insulin
   D. Bacterial insulin

2. **The human insulin gene is inserted into which organism for mass production?**
   A. Bacteria
   B. Plants
   C. Yeast
   D. Algae

3. **Gene therapy is used to:**
   A. Replace defective genes
   B. Remove unwanted proteins
   C. Modify bacteria
   D. Treat fungal infections

4. **Which disease is a target for gene therapy?**
   A. Diabetes
   B. Severe Combined Immunodeficiency (SCID)
   C. Cancer
   D. Tuberculosis

5. **Golden rice is an example of:**
   A. Biofortification
   B. Bioremediation
   C. GM crops for pest resistance
   D. Hydroponics

6. **The production of vaccines using biotechnology involves:**
   A. Cloning pathogens
   B. Generating recombinant proteins
   C. Modifying DNA structure
   D. Isolating natural antibodies

7. **Bt toxin in genetically modified crops is derived from**:
   A. *Bacillus thuringiensis*

B. *Escherichia coli*
C. *Streptococcus pneumoniae*
D. *Pseudomonas fluorescens*

8. The first genetically modified crop introduced in India was:
A. Bt Cotton
B. Golden Rice
C. Bt Brinjal
D. Herbicide-Resistant Corn

9. *Agrobacterium tumefaciens* is used in genetic engineering as:
A. A pest
B. A natural genetic engineer
C. A pathogen
D. A growth hormone

10. The recombinant Hepatitis B vaccine is produced in:
A. Yeast
B. Bacteria
C. Fungi
D. Viruses

11. GM crops like soybean are modified for:
A. Pest resistance
B. Drought tolerance
C. Herbicide resistance
D. Disease resistance

12. Transgenic animals are used for:
A. Producing vaccines
B. Testing drug safety
C. Gene therapy research
D. All of the above

13. The first product of recombinant DNA technology was:
A. Human Insulin
B. Hepatitis B Vaccine
C. Antibiotics
D. Golden Rice

14. Edible vaccines are produced in:

A. Bacteria
B. Plants
C. Animals
D. Fungi

15. DNA fingerprinting is used for:

A. Solving crimes
B. Paternity testing
C. Genetic diversity studies
D. All of the above

16. CRISPR-Cas9 is used in biotechnology for:

A. Gene editing
B. DNA replication
C. Protein synthesis
D. Vaccine production

17. The production of pharmaceuticals using genetically modified organisms is known as:

A. Biopharming
B. Biotechnology
C. Genetic therapy
D. Bioremediation

18. Which vaccine is an example of a genetically engineered product?

A. Polio vaccine
B. Hepatitis B vaccine
C. Smallpox vaccine
D. Rabies vaccine

19. Restriction enzymes are used in genetic engineering to:

A. Cut DNA at specific sites
B. Replicate DNA
C. Synthesize proteins
D. Repair damaged DNA

20. Which of these is a genetically modified crop for pest resistance?

A. Bt Brinjal
B. Hybrid Tomato

C. Rice Varieties
D. Sugarcane

21. Gene cloning involves:
A. Amplifying a specific gene
B. Cloning an organism
C. Cutting DNA randomly
D. None of the above

22. Golden rice is enriched with:
A. Vitamin A
B. Vitamin B
C. Vitamin C
D. Vitamin D

23. Somatic gene therapy involves modifications in:
A. Somatic cells
B. Germ cells
C. Embryos
D. Fertilized eggs

24. Genetically modified organisms are used in healthcare for:
A. Antibiotic production
B. Vaccine development
C. Hormone production
D. All of the above

25. Antisense RNA technology is used to:
A. Block specific gene expression
B. Synthesize proteins
C. Enhance gene expression
D. Repair DNA

26. Biosensors in biotechnology detect:
A. DNA mutations
B. Environmental toxins
C. Pathogens
D. All of the above

27. The first artificial vaccine developed using recombinant technology was for:

A. Hepatitis B
B. Polio
C. Measles
D. Tuberculosis

28. Antibodies produced in genetically modified plants are known as:
A. Plantibodies
B. Phytoproteins
C. Immunomodulators
D. None of the above

29. Ethical concerns about gene therapy include:
A. Safety
B. Accessibility
C. Genetic inequality
D. All of the above

30. Biopesticides derived from biotechnology are:
A. Organic chemicals
B. Natural organisms or their byproducts
C. Artificial compounds
D. Synthetic proteins

31. An example of biopiracy is:
A. Exporting crops legally
B. Unauthorized patenting of neem or turmeric properties
C. Developing hybrid plants
D. Preserving biodiversity in reserves

32. Transgenic animals are used to:
A. Study ecosystems
B. Increase crop production
C. Produce therapeutic proteins
D. Generate renewable energy

33. Herbicide-tolerant GMOs help farmers by:
A. Increasing the crop yield
B. Killing beneficial organisms
C. Simplifying weed control
D. Enhancing biodiversity

34. Which organization oversees GMO safety in India?

A. ICAR
B. GEAC
C. NABARD
D. NGT

35. Bioprospecting is the:

A. Illegal use of natural resources
B. Study of biological resources for commercial use
C. Exploitation of indigenous knowledge
D. Preservation of endangered species

36. A key benefit of Bt crops is:

A. Enhanced taste
B. Reduced pesticide use
C. Faster growth rates
D. Increased herbicide tolerance

37. A biosafety issue associated with GMOs is:

A. Increased crop yields
B. Potential allergenicity
C. Improved shelf life
D. Reduced need for fertilizers

38. Transgenic plants can produce:

A. Pesticides
B. Vaccines
C. Growth hormones
D. Antibiotics

39. The precautionary principle in biosafety means:

A. Avoiding all GMOs
B. Taking preventive action before harm occurs
C. Banning genetically modified crops
D. Promoting GMOs globally

40. Which international agreement addresses GMO safety?

A. Kyoto Protocol
B. Montreal Protocol

C. Cartagena Protocol
D. Basel Convention

41. Which of the following contributes most to plastic pollution in oceans?
A. Agricultural runoff
B. Industrial spills
C. Improper disposal of single-use plastics
D. Overfishing

42. Green energy sources include:
A. Coal and natural gas
B. Solar and wind energy
C. Nuclear power
D. Geothermal and fossil fuels

43. A primary pollutant released by vehicles is:
A. Methane
B. Carbon monoxide
C. Ozone
D. Nitric acid

44. Excessive phosphates in water bodies primarily lead to:
A. Eutrophication
B. Thermal pollution
C. Water scarcity
D. Biodiversity gain

45. Waste-to-energy technology involves:
A. Incinerating waste to generate power
B. Composting biodegradable waste
C. Recycling plastic waste
D. Producing biofuels from algae

46. A sustainable alternative to chemical pesticides is:
A. Organic farming using biopesticides
B. Increasing pesticide application rates
C. Landfilling excess pesticides
D. Replacing fertilizers with synthetic chemicals

47. Pollination is an example of:

A. Air pollution control
B. An ecological service
C. Solid waste management
D. Thermal pollution reduction

48. Carbon sequestration refers to:

A. Increasing carbon emissions
B. Capturing and storing atmospheric carbon dioxide
C. Removing carbon from fossil fuels
D. None of the above

49. Which of the following is a waterborne disease caused by pollution?

A. Malaria
B. Cholera
C. Tuberculosis
D. Typhoid

50. A key challenge in recycling plastics is:

A. High energy requirements
B. Limited availability of plastics
C. High biodegradability of plastics
D. Lack of demand for recycled products