Biotechnology For Class 12

Protein Structure and Engineering

Q 1 In isolating recombinant insulin from a culture of *E.coli,* the cells were filtered and filtrate was subjected to a purification protocol. However, no insulin was obtained. Why?

Q 2 What will happen when normal protein misfolds or undergoes incorrect conformational changes?

Q 3 Who developed first the protein sequencing method? Name the protein to be sequence first.

Q 4 Name the protein to be sequenced first.

Mark (1)

Q 5 How are active sites exposed on protein surface?

Mark (1)

Q 6 Why do hydrophobic regions of a protein form the core of a folded protein?

Mark (1)

Q 7 Lack of beta chain in haemoglobin results in which diseases?

Mark (1)

Q 8 Name the two dyes commonly used in two-dimensional gel electrophoresis.

Mark (1)

Q 9 What was the first genetically engineered vaccine produced in India?

Mark (1)

Q 10 Why curd is used as pro-biotic?

Mark (1)

Q 11 How does chymotrypsin work?

Marks (2)

Q 12 What are Nutraceutical proteins?

Marks (2)

Q 13 What is mass spectrometer?

Marks (2)

Q 14 How can you introduce specific point mutations in a protein (studied by you)? What will be its effect on the stability of the protein?

Marks (2)

Q 15 Distinguish between chymotrypsinogen and chymotrypsin.

Marks (2)

Q 16 Give at least four steps to maximize the protein stability during various isolation procedure.

Marks (2)

Q 17 Define the term proteomics. Write the importance of expressional proteomics and functional proteomics.

Marks (2)

Q 18 Write the functions of t-PA and DNase.

Marks (2)

Q 19 Which of the following proteins would be expected to migrate, fastest through SDS-PAGE gel, and why?

Protein	MW (in Daltons)
Transferrin	90,000
α - Antitrypsin	45,000
Myoglobin	17,000
Cytochrome c	13,000
Serum albumin	69,000

Marks (2)

Q 20 The relationship between the number of genes and the number of proteins is non-linear. Justify the statement.

Marks (2)

Q 21

Study the following enzyme purification table and answer the following questions:

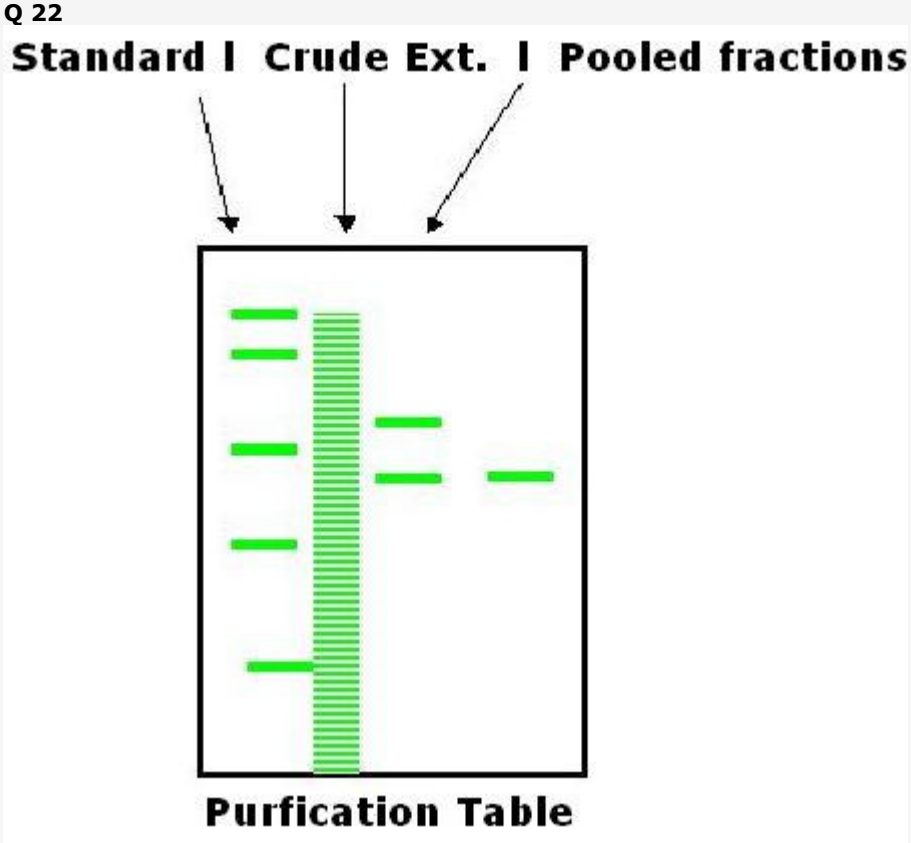
(a) Which step in the purification is most effective, and why?

(b) Which of the procedures is least effective and why?

Procedure	Total protein (mg)	Activity (units)
Crude extract	20000	40,00,000
Precipitation (salt)	5000	30,00,000
Precipitation (pH)	4000	10,00,000
Ion-exchange chromatography	200	8,00,000
Affinity chromatography	50	7,50,000
Size exclusion chromatography	45	6,75,000

Marks (2)

Q 22



Purfication Table

Procedure	Fraction (ml)	Total Protein (ml)	Activity (Units)	Specific activity Units/mg
Crude cellular extract	1400	10000	100000	10
Separation method 1	90	400	80000	200
Separation method 2	8	4	60000	15000

Marks (3)

Q 23 *E.coli* is a rod shaped bacterium having 1μm length. The average density of a cell is 1.28g/ml. About 13.5% of the wet weight of *E.coli* is soluble protein. Estimate the number of molecule of a particular enzyme per cell if the enzyme has a molecular weight of 100,000 and represent 0.1% of the total soluble protein.

Marks (3)

Q 24 What are essential amino acids? Which among these- casein, egg protein, soy protein, rice protein, wheat protein and whey protein is a better nutritional protein and why?

Marks (3)

Q 25 Give the three groups of amino acids.

Marks (3)

Q 26 Complete the purification table given below:

Purification procedure	Total protein (mg)	Total activity (unit)	Specific activity	Purification level
Crude extract	30,000	6,000,000		
Salt precipitation	2,000	1,200,000		
DEAE-cellulose chromatography	1,500	1,000,000		
Size exclusion chromatography	500	750,000		

Marks (3)

Q 27 Name one 'laundry enzyme'. How it is inactivated? How can we increase the stability of the enzymes?

Marks (3)

Q 28 What are the principles of isoelectric focusing and SDS-PAGE technique? Why is two dimensional electrophoresis better than one-dimensional electrophoresis?

Marks (3)

Q 29 What is molecular pharming? Suggest any four advantages of expressing transgenic proteins in milk?

Marks (3)

Q 30 What is OKT-3? Why is it administered to patients undergoing organ transplantation? What is the relevance of fusing an antibody producing B-cell with myeloma cells in hybridoma technology?

Marks (3)

Q 31 What is the role of Mass Spectrometry in Proteomics?

Marks (3)

Q 32 What is mass spectrometry (MS)? What information does mass spectrometry provide?

Marks (5)

Q 33 What is proteomics? Explain different types of proteomics.

Marks (5)

Q 34 How does 'charge relay system' operate in chymotrypsin?

Marks (5)

Q 35 I. What do you understand by catalytic triad?
II.Give the names of some enzyme, which possess serine protease residue that assist catalysis?
III. Why these enzymes are inhibited by organophosphates.

Marks (5)

Most Important Questions

Q 1 What are cell specific proteins?

Q 2 Distinguish between intracellular and extracellular proteins?

Q 3 Lack of beta chain in haemoglobin results in which disease? How does this disease arise?

Q 4 Who developed the method of protein sequencing for the first time and what are his contributions in protein studies?

Q 5 Which reagent is used for the sequential removal of amino acids in a protein? Name the scientist who used it for the first time.

Q 6 How are active sites exposed on protein surface?

Q 7 Indicate the type of non-covalent interactions that contribute to protein folding and describe each in brief.

Q 8 Give the structure of chymotrypsin and explain how charge-relay system operates?

Q 9 Describe the technique of protein fingerprinting using an example.

Q 10 What is pI? What technique would you use to calculate pI of a protein?

Q 11 What is the principle for separating proteins on SDS-PAGE?

Q 12 What do you understand by secondary and tertiary structures of the protein? Which conformation of protein is most stable in solution?

Q 13 What happens when glutamic acid at position 6 of chain is replaced by valine amino acid in haemoglobin?

Q 14 How the chymotrypsinogen becomes active in the body?

Q 15 Why the structure of a protein is paramount to its function?

Q 16 Indicate four general precautions to be observed for maximal stability of protein during purification.

Q 17 What do you understand by the term downstream processing?

Q 18 Elaborate and define the term GRAS.

Q 19 What is mass spectrometry? How is it helpful in protein characterization?

Q 20 Describe MALDI.

Q 21 Explain ESI in detail.

Q 22 What is the general principle of a mass spectrometer?

Q 23 List the different techniques, which are used to determine the purity of the proteins.

Q 24 What are the points which should be considered for the scale-up of protein purification?

Q 25 How you can purify a protein by aqueous two-phase partition?

Q 26 What are the various parts of a mass spectrometer? Explain with the help of a diagram.

Q 27 What do you understand by Molecular pharming?

Q 28 What are the two ionization methods used in proteomics?

Q 29 A single cell of *E. coli* is supposed to produce about 2000 different proteins under optimum conditions. One of the desired intracellular enzymes produced is in the form of 2000 molecules/cell. If the molecular weight of that enzyme is 100000 D, how many *E. coli* cells are required to produce 1 g of this enzyme?

Q 30 Assume that the bacterial cell is a cylinder (diameter 2m and length 4m); calculate (i) the total volume of the cell to produce 1 g of enzyme, and (ii) volume of fermentor required (maximum cell concentration inside the fermentor is 6% as it needs space to multiply).

Q 31 What do you understand by recombinant or subunit vaccines?

Q 32 Why is it important to design a protein by protein engineering?

Q 33 Briefly discuss proteomics.

Q 34 What are Nutraceutical proteins? Explain giving suitable examples.

Q 35 Write short note on Subtilisin.

Q 36 List the various proteins based products.

Q 37 Enumerate two monoclonal antibodies used in the treatment of diseases.

Q 38 What are probiotics?

Q 39 What are the various parameters to estimate the nutritional value of dietary proteins?

Q 40 What exactly is whey protein?

Q 41 Explain some therapeutic enzymes.

Q 42 Describe the Expression proteomics.

Q 43 Differentiate between genome and proteome.

Q 44 Who should use whey protein? Is it for everyone concerned with bodybuilding?

Q 45 How does studying the proteome compare to studying the genome? What are some of the challenges in proteomics research?

Recombinant DNA Technology

Q 1 Why is the primer required in PCR added at the 3' end of DNA template?

Mark (1)

Q 2 Why is chitinase required to extract DNA from fungal cells?

Mark (1)

Q 3 What is a gene product?

Mark (1)

Q 4 What is origin of replication?

Mark (1)

Q 5 In which organism was restriction endonuclease first identified?

Mark (1)

Q 6 What is agarose?

Mark (1)

Q 7 Define Transformation.

Mark (1)

Q 8 How DNA is amplified?

Mark (1)

Q 9 What is a recombinant protein?

Mark (1)

Q 10 What is the difference between a mutant gene and a recombinant gene?

Mark (1)

Q 11 What does the DNA fragments at the topmost and lowermost parts on an electrophoresis gel suggest?

Marks (2)

Q 12 During complementary base pairing between the restriction fragments of DNA from two different sources, why is DNA ligase required?

Marks (2)

Q 13 Can exonucleases act as restriction enzymes? Why?

Marks (2)

Q 14 What will happen if a piece of DNA not associated with a replication origin ('Ori') is inserted into another genome?

Marks (2)

Q 15 If a viral DNA is inserted into a bacterial DNA, which way will it be effective in recombinant DNA technology, lytic cycle or lysogenic cycle?

Marks (2)

Q 16 What is cloning?

Marks (2)

Q 17 How can you say that genetically modified food is preferable to the traditional food?

Marks (2)

Q 18 How does ethidium bromide help in visualizing DNA?

Marks (2)

Q 19 Which of the two will join more readily- human DNA cut with *Hin*dII and spider DNA cut with *Hin*dII or human DNA cut with *Eco*RI and another human DNA cut with *Hin*dII?

Marks (2)

Q 20 Why PCR is known as a chain reaction?

Marks (2)

Q 21 How can an oncogenic retrovirus be used as a safe cloning vector?

Marks (2)

Q 22 Can an RNA sample be amplified using PCR? Why?

Marks (2)

Q 23 Why is Taq polymerase called so?

Marks (2)

Q 24 Can DNA be isolated without using proteases from an eukaryotic cell?

Marks (2)

Q 25 How are cosmids more beneficial than plasmids in recombinant DNA technology?

Marks (2)

Q 26 Will centrifugation of a cell is sufficient in isolating an eukaryotic DNA?

Marks (2)

Q 27 Why is Biolistics not suitable for animal cells?

Marks (2)

Q 28 How does PCR help in diagnosis of diseases?

Marks (2)

Q 29 What do you understand by cloning?

Marks (2)

Q 30 What are 'molecular scissors'?

Marks (2)

Q 31 Explain the working of a restriction endonuclease.

Marks (2)

Q 32 What are sticky ends? What is its significance?

Marks (2)

Q 33 Why are plasmids and bacteriophages are used as cloning vectors?

Marks (2)

Q 34 What is an antibiotic resistance gene? What is its significance in Recombinant DNA technology?

Marks (2)

Q 35 What do you understand by the term competent host with reference to recombinant DNA technology?

Marks (2)

Q 36 What is a primer? What is it required for?

Marks (2)

Q 37 What is the sole purpose of recombinant DNA technology?

Marks (2)

Q 38 How do you separate DNA fragments?

Marks (2)

Q 39 Write a short note on gel-electrophoresis?

Marks (3)

Q 40 What is insertional inactivation? Give an example.

Marks (3)

Q 41 Write a short note on *Agrobacterium tumefaciens*.

Marks (3)

Q 42 Explain how yeast cell act as a host?

Marks (3)

Q 43 Why are the recognition sites of restriction endonucleases known as palindromic sites? Give example to explain.

Marks (3)

Q 44 How will you obtain a recombinant DNA from a bacterial cell?

Marks (3)

Q 45 How does genetic recombination occur in nature?

Marks (3)

Q 46 How can a recombinant vector be identified among other cells?

Marks (3)

Q 47 Why are plasmids and not original bacterial DNA preferred as vectors?

Marks (3)

Q 48 Why are two DNAs to be joined with one another treated with the same restriction enzyme and not different ones?

Marks (3)

Q 49 If the restriction site is within an antibiotic resistance gene, how will the recombinant vector be recognized?

Marks (3)

Q 50 How can DNA be purified from a sample of cell?

Marks (3)

Q 51 What do you understand by the term Genetic engineering? What are the basic three steps involved in genetic modification of an organism?

Marks (3)

Q 52 What are vectors? Write a short note on cloning vectors.

Marks (3)

Q 53 Write a short note on DNA ligase.

Marks (3)

Q 54 What are the keys tools required for genetic engineering?

Marks (3)

Q 55 What is known as recognition sequence of a restriction endonuclease? Give two examples.

Marks (3)

Q 56 Describe the convention for naming restriction endonucleases.

Marks (3)

Q 57 What are nucleases? What is the difference between endonucleases and exonucleases?

Marks (3)

Q 58 What is a palindromic sequence? What is its significance in Genetic engineering?

Marks (3)

Q 59 Write a short note on pBR322.

Marks (3)

Q 60 Write a short note on the followings:

a. ori
b. Selectable marker
c. Cloning sites

Marks (5)

Q 61 What are the various methods available for inserting an engineered vector into the host?

Marks (5)

Q 62 Write short note on the followings:

a. Micro-injection
b. Biolistics
c. Disarmed pathogen

Marks (5)

Q 63 Expand PCR. Explain the steps involved in the technique. What is the PCR machine called?

Marks (5)

Q 64 Explain the procedure of site –directed mutagenesis.

Marks (5)

Q 65 With a diagram explain the steps involved in recombinant DNA technology.

Marks (5)

Most Important Questions

Q 1 How nomenclature of restriction enzymes is done? Explain with the help of one example.

Q 2 Differentiate between sticky ends and blunt ends.

Q 3 Give a short note on RFLP.

Q 4 What do you understand by a cloning vector?

Q 5 How does restriction modification system works in bacteria?

Q 6 What do you understand by recognition sequence?

Q 7 Describe briefly the various steps involved in recombinant DNA technology.

Q 8 Why restriction enzymes are called 'molecular scissors'?

Q 9 Write about the enzymes, which seals nicks between adjacent nucleotides in a double-stranded DNA molecule.

Q 10 Explain inhibition of recircularization by alkaline phosphatase.

Q 11 Differentiate between plasmid, bacteriophage and cosmid.

Q 12 What do you understand by 'ori'.

Q 13 Why the presence of selectable marker is essential feature of an ideal vector.

Q 14 Give the recognition sequences of *Eco*RII, *Hae*III, *Hind*III and *Alu*I

Q 15 What are the three major classes of restriction endonucleases? Differentiate between them.

Q 16 Give the structural organization of pUC19.

Q 17 Discuss the selectable markers and recognition sites of pBR322. Describe with the help of diagram.

Q 18 What are bacteriophage vectors? In what way they are advantageous over plasmid vectors?

Q 19 Distinguish between cDNA library from genomic library.

Q 20 Distinguish between plasmid and cosmid.

Q 21 How a recombinant DNA is introduced into host cells? Describe in brief.

Q 22 What is genomic library? How is a genomic library constructed?

Q 23 Differentiate between shuttle vector and expression vector.

Q 24 Write a note on YAC and BAC.

Q 25 Explain why eukaryotic foreign gene requires eukaryotic cell for its expression?

Q 26 What are the desirable properties of M13 vectors?

Q 27 Give an account on Gemini viruses. Under which category they are placed?

Q 28 Why are mRNA not directly cloned?

Q 29 What do you understand by DNA library

Q 30 What is Biolistics?

Q 31 Differentiate chemically between dNTP and ddNTP and explain why ddNTP are used in the Sanger's method of DNA sequencing?

Q 32 What is PCR? How it helps in amplification of the DNA segments?

Q 33 What are molecular probes? How single stranded RNA probes can be prepared?

Q 34 Discuss the technique of Southern Hybridization.

Q 35 What do you understand by marker gene or reporter gene.

Q 36 What do you understand by blue-white selection for identification of clones?

Q 37 Describe dye termination sequencing.

Q 38 Schematically describe site-directed mutagenesis and explain applications of this technique.

Q 39 SDM (site-directed mutagenesis) can be used to produce proteins for almost any kind of useful task. Illustrate by giving one example.

Q 40 What are the methods of DNA sequencing?

Q 41 Why dideoxy method is also called chain termination method?

Q 42 How the nontransformed cells are eliminated from the recombinant cells?

Q 43 What are the requirements of PCR technique carried in vitro?

Q 44 How PCR is helpful in the generation of RAPD?

Q 45 What do you understand by the terms- Northern Blotting and Western Blotting.

Q 1 What is the IUPAC code for G or C?

Mark (1)

Q 2 Write the complementary sequence of the following sequence:
5' GACATRTAB 3'

Mark (1)

Q 3 What does NCBI stands for?

Mark (1)

Q 4 What do you understand by BLAST and FASTA?

Mark (1)

Q 5 Write the base which are denoted by symbol D.

Mark (1)

Q 6 What is the single letter code for?
(a) Tryptophan
(b) Serine

Mark (1)

Q 7 Who coined the term Genomics?

Mark (1)

Q 8 What does FISH stands for?

Mark (1)

Q 9 Give disadvantage of BACs.

Mark (1)

Q 10 Name any data retrieval tool?

Mark (1)

Q 11 Who builds a GenBank?

Mark (1)

Q 12 In which direction, proteins are synthesized?

Mark (1)

Q 13 In which direction, nucleotides are synthesized?

Mark (1)

Q 14 What is PubMed?

Mark (1)

Q 15 What is ENTREZ?

Mark (1)

Q 16 What are GSTs?

Marks (2)

Q 17 What is the aim behind Nick translation?

Marks (2)

Q 18 Indicate the importance of generating SNP maps.

Marks (2)

Q 19 What are the different areas bioinformatics covers?

Marks (2)

Q 20 What is the use of IUPAC system of nomenclature?

Marks (2)

Q 21 What does Y stands for? Give the name of the base.

Marks (2)

Q 22 What is the code for G or A? Write the complementary sequence of the following sequence:
5' ATGAYCGBT 3'

Marks (2)

Q 23 Give two uses of directionality concept.

Marks (2)

Q 24 What are the uses of SWISS- PROT and EMBL?

Marks (2)

Q 25 How information of relationship between the organisms can be obtained?

Marks (2)

Q 26 What is genome database?

Marks (2)

Q 27 What information does ENTREZ stores?

Marks (2)

Q 28 What is RefSeq database?

Marks (2)

Q 29 What is HomoloGene database?

Marks (2)

Q 30 Give labeled diagram of EST construction.

Marks (3)

Q 31 What are information sources? Give their types?

Marks (3)

Q 32 What are SNPs? Give its uses.

Marks (3)

Q 33 Write short notes on
(a) ESTs
(b) BLAST
(c) NCBI

Marks (3)

Q 34 How is the microarray technique used to differentiate a normal cell from a disease one?

Marks (3)

Q 35 Why it was necessary to create bioinformatics database?

Marks (3)

Q 36 What conventions the Database personnel adopt to store nucleic acid data and protein sequence with regard to the direction of the sequence?

Marks (3)

Q 37 What is the meaning of silico gene prediction?

Marks (3)

Q 38 What is Genome sequencing and what is its importance?

Marks (3)

Q 39 Define Genomics giving its types.

Marks (3)

Q 40 What is DNA microarray? How it works?

Marks (3)

Q 41 Name different types of sequences and explain them.

Marks (5)

Q 42 List the resources available from NCBI and their uses.

Marks (5)

Q 43 What are the difference between BAC and shotgun sequencing?

Marks (5)

Q 44 What are the uses of bioinformatics tools in the analysis of biological data?

Marks (5)

Q 45 What is functional genomics? Give the three main technologies involved with it.

Marks (5)

Most Important Questions

Q 1 Write the importance of Genomic Sequencing projects?

Q 2 How can SNPs be used to predict susceptibility to diseases?

Q 3

What is the IUPAC code for T or C? Write the complementary sequence of the following sequence:
5'- ATGAYCGBT-3'

Q 4 What are the advantages of using bacterial artificial chromosomes (BAC) in sequencing programmes.

Q 5 What is DNA microarray technology? Also depict its major steps diagrammatically.

Q 6 Write short notes on
(a) Nick translation
(b) SNPs

Q 7 What are the main steps in J.Craig's EST approach? Give its merits.

Q 8 How Fluorescent in situ hybridization (FISH) technique works? Explain with the help of diagram.

Q 9 Name and explain the main methods used in small scale sequencing of entire genome.

Q 10 What is the importance of DNA microarray technology?

Q 11 Explain genome similarity with an example.

Q 12 What is ESTs? Give its advantages in genome analysis?

Q 13 Give flow chart of top down sequencing.

Q 14 What is gene prediction and gene counting?

Q 15 A Chronic Mylogenous Leukemia (CML) patient has been put on a combination drug therapy for the past 2 months? How can the FISH technique be used to monitor the effect of chemotherapy?

Q 16 Name the database that was created to manage redundancy in ESTs.

Q 17 What are data retrieval tools?

Q 18 Explain 'BLAST'. What kind of analysis can be done with this search tool?

Q 19 What are the uses of directionality concept?

Q 20 Define Genescan giving its uses?

Q 21 What is homologs and paralogs?

Q 22 If a sequence is given to you without any label, how will you find out whether it is a DNA, RNA or a Protein sequence?

Q 23 Define bioinformatics and give aims of bioinformatics?

Q 24 What is NCBI? What is its work?

Q 25 Name the different resources and tools provided by NCBI.

Q 26 Name different types of sequences available on Internet?

Q 27 What is the role of curator in bioinformatics data analysis?

Q 28 What are the three main resources for gene level sequences?

Q 29 Give the principles involved in BLAST.

Q 30 Priyanka sequenced the genome of an unknown organism. She wants to know the ancestry of the organism and the homologous sequences. Guide her?

Biotechnology For Class 12

Microbial Culture and Applications

Q 1 In which phase of growth, specific growth rate is measured in microbial culture?

Mark (1)

Q 2 Suggest any three methods of preserving microbial strain.

Mark (1)

Q 3 What is Lyophilization?

Mark (1)

Q 4 Why is it suggested to work with GRAS organisms?

Mark (1)

Q 5 How heat labile substances such as an antibiotic solution can be sterilized?

Mark (1)

Q 6 Which of the two methods will be better for measurement of microbial growth- viable plate count or a slide counting chamber and why?

Mark (1)

Q 7 Name a commonly used anti foaming agent?

Mark (1)

Q 8 Name any culture collection centre and its location?

Mark (1)

Q 9 If a bacterial culture contains 10^4 cells/ml at t_0 and 10^9 cells/ml after 4 hours, calculate its specific growth rate and doubling time.

Marks (2)

Q 10 Why are lyophilized microbial cultures viable for more than ten years?

Marks (2)

Q 11 What is continuous culture? Give one application of setting up continuous cultures in microbial technology?

Marks (2)

Q 12 Why is nutrient medium autoclaved before it is used for culturing microbes?

Marks (2)

Q 13 What is a fed- batch culture? Why it is preferred than a batch culture?

Marks (2)

Q 14 In the presence of glycerol and a high concentration of serum, it is possible to store microbial cultures for long periods at very low temperatures why?

Marks (2)

Q 15 What are microbial culture collection centre? Suggest any two benefits?

Marks (2)

Q 16 How is contamination avoided in fermentation?

Marks (2)

Q 17 What are baffle flasks and how they are used?

Marks (2)

Q 18 What is downstream processing? Write the steps of isolation of a microbial metabolite?

Marks (3)

Q 19 Schematically depict the stages in downstream processing of recombinant insulin.

Marks (3)

Q 20 What structural components are used for aeration and agitation in an industrial fermenter?

Marks (3)

Q 21 Write five ethical issues of microbial technology.

Marks (3)

Q 22 What do you mean by strain improvement? Explain it by giving an example.

Marks (3)

Q 23 What are the steps involved in isolation of fermentation product?

Marks (3)

Q 24 What is scale up of microbes?

Marks (3)

Q 25 What are different applications of microbial culture technology?

Marks (5)

Q 26 How microbial growth is measured?

Marks (5)

Q 27 What are different methods for strain preservation?

Marks (5)

Most Important Questions

Q 1 How will you measure the growth of microbial cells?

Q 2 How the cell mass present in the liquid culture, pellet out on the bottom of the eppendorf?

Q 3 How the oxygen demand of microorganism is fulfilled?

Q 4 Why sterilization of media and instruments in laboratory is necessary?

Q 5 How contamination is avoided in laboratories?

Q 6 How will you design an experiment for making agar plates?

Q 7 What are the main constituents of media?

Q 8 What is the importance of water in the growth of microorganism?

Q 9 What is the consequences of using contaminated culture in large-scale fermentor?

Q 10 Write the steps for using an autoclave in laboratory.

Q 11 Which culture method is most suitable for the production of biomass or metabolite?

Q 12 How spectrophotometer is used in measurement of cell mass?

Q 13 After the completion of fermentation reaction how the product is isolated from the rest of culture?

Q 14 Derive the expression for specific growth rate.

Q 15 Give diagrammatical representation of spread plate and pour plate methods.

Q 16 The natural strain of *Aspergillus niger* is producing very low amount of citric acid. How you will solve this problem?

Q 17 How will you store microbial culture in liquid nitrogen?

Q 18 What is the need of preserving isolated microbial cultures?

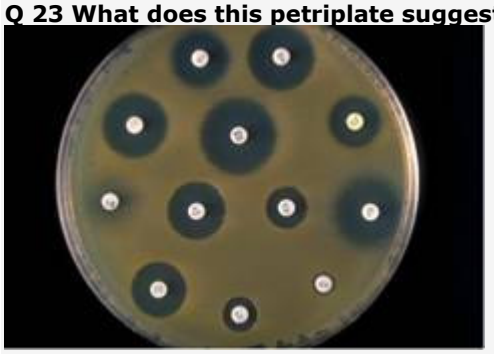
Q 19 What is the next step after isolation of microbes? Give any two methods.

Q 20 What do you mean by GRAS? How they are beneficial?

Q 21 What will happen if the genetically modified microorganism escapes from laboratory?

Q 22 Give different applications of microbial technology.

Q 23 What does this petriplate suggest?



Q 24 What are culture collection centres? Give examples.

Plant Cell Cultures and Applications

Q 1 Who is regarded the father of embryology in India?

Mark (1)

Q 2 Who is known as the father of tissue culture?

Mark (1)

Q 3 Who proposed the concept of the famous cell theory?

Mark (1)

Q 4 What is promoted at high concentration of cytokinins?

Mark (1)

Q 5 Which genes provide insect pest resistance?

Mark (1)

Q 6 What is molecular farming?

Mark (1)

Q 7 What is *in vitro* morphogenesis?

Mark (1)

Q 8 What are the benefits of micropropagated plants?

Mark (1)

Q 9 What is Polyethylene Glycol?

Mark (1)

Q 10 What is plant transplantation?

Marks (2)

Q 11 What are 'pomatoes' or 'topatoes'?

Marks (2)

Q 12 What do you mean by totipotency?

Marks (2)

Q 13 What are the various types of culture media used in plant cell, tissue and organ culture?

Marks (2)

Q 14 What do you think about 'second green revolution'?

Marks (2)

Q 15 What is somatic embryogenesis?

Marks (2)

Q 16 What is embryo rescue?

Marks (2)

Q 17 What is micropropagation?

Marks (2)

Q 18 Define explant culture?

Marks (2)

Q 19 What are the importances of protoplast culture?

Marks (3)

Q 20 What is the contribution of Gottieb Haberlandt in plant cell culture?

Marks (3)

Q 21 Write a note on molecular farming?

Marks (3)

Q 22 Explain organogenesis?

Marks (3)

Q 23 Give an example of transgenic plant with nutrient quality?

Marks (3)

Q 24 Explain *In vitro* plant germplasm conservation?

Marks (3)

Q 25 Give a detailed account of various types of plant cell culture?

Marks (5)

Q 26 Explain the basic techniques of plant tissue culture?

Marks (5)

Q 27 Write an extended note on gene transfer methods in plants.

Marks (5)

Most Important Questions

Q 1 Who is regarded as the 'father of embryology' in India?

Q 2 Give a detailed account of the basic techniques of plant tissue culture?

Q 3 Write the name of various types of culture media used in plant cell, tissue and organ culture.

Q 4 Brief on different types of plant cell culture?

Q 5 What are the processes of plant regeneration?

Q 6 What is totipotency?

Q 7 Who was Gottieb Haberlandt?

Q 8 What do you think about the 'second green revolution'?

Q 9 Explain micropropagation.

Q 10
What do you think about artificial or somatic seeds?

Q 11 What is somatic hybridization?

Q 12 What are 'pomatoes' and 'topatoes'?

Q 13
Write a short note on the followings-
1. Somaclonal variation

2. Gametoclonal variation:

Q 14 What is *In vitro* plant germplasm conservation?

Q 15 What are the techniques used for plant cell and tissue germplasm conservation?

Q 16 Explain gene transfer methods in plant?

Q 17 What is transgene analysis?

Q 18 Write a note on transgenic plants with beneficial traits.

Q 19 Suggest any three applications of plant cell culture techniques with explanation.

Q 20 What do you mean about delayed ripening of fruits?

Q 21 What are the applications of production of male sterile plants?

Q 22 What is molecular farming?

Q 23 What are edible vaccines?

Q 24 What are biodegradable plastics.

Q 25 Write a note on molecular breeding including various types of markers use in screening/selection.

Q 26 To find one linked to a given trait, how many markers must be screened?

Q 27 Why does public view GM foods with concern?

Q 28 What do you mean about seed protein quality and how we can achieve this objective?

Q 29 Describe nutrient quality of transgenic crops.

Q 30 Why is *Bacillus thuringiensis* important?

Q 1 What is cell culture?

Mark (1)

Q 2 What is primary cell culture?

Mark (1)

Q 3 Who first grew poliomyelitis virus in culture?

Mark (1)

Q 4 Which animal cell-line produces t-PA?

Mark (1)

Q 5 By which technology monoclonal antibodies are produced?

Mark (1)

Q 6 What is subculturing?

Mark (1)

Q 7 What are the two types of cell line?

Mark (1)

Q 8 What is the optimum temperature for human cell culture?

Mark (1)

Q 9 What is media ?

Mark (1)

Q 10 What is thawing?

Marks (2)

Q 11 What is the role of tissue culture hood?

Marks (2)

Q 12 What do you mean by HEPA?

Marks (2)

Q 13 What is scale-up of animal culture?

Marks (2)

Q 14 Why mammalian cell culture are used to produce Factor VIII?

Marks (2)

Q 15 What are the advantages of rHuEPO over blood replacement or transfusion?

Marks (2)

Q 16 What is hematopoietin?

Marks (2)

Q 17 What is the role of OKT3 in tissue transplantation?

Marks (2)

Q 18 What are the types of media used for animal cell culture?

Marks (2)

Q 19 How are monoclonal antibodies produced?

Marks (3)

Q 20 What is the role of serum in animal cell culture?

Marks (3)

Q 21 What do you understand by cryopreservation?

Marks (3)

Q 22 What are the different phases of growth in cell lines?

Marks (3)

Q 23 Write a short note on microcarrier beads.

Marks (3)

Q 24 What are the different applications of tissue plasminogen activator?

Marks (3)

Q 25 Give a detailed account of applications of animal cell culture.

Marks (5)

Q 26 Explain the bioethics in animal genetic engineering?

Marks (5)

Q 27 Write notes on the followings:

1. Roller bottles
2. Finite cell lines

Marks (5)

Most Important Questions

Q 1 What is cell culture?

Q 2 What do you think about stem cell technology?

Q 3 What is bio civil engineering?

Q 4 Explain the term contact inhibition?

Q 5 What is primary cell culture?

Q 6
Write a short note on the followings-
1. Adherent cells or Anchorage-dependent
2. Suspension culture or Anchorage-independent

Q 7 What is the need of secondary cell culture?

Q 8 Give a detailed account of cell line in animal cell culture?

Q 9 Write an essay on physical environment for culturing animal cells.

Q 10 What is the utilization of cryopreservation in animal cell culture?

Q 11 Describe important equipments required for animal cell culture?

Q 12 What do you mean by microcarrier beads?

Q 13 What do you think about characterization of cell lines? Explain with the help of diagram.

Q 14 Explain roller bottle with the help of figure.

Q 15 With the help of suitable diagram explain spinner cultures?

Q 16 What is tissue plasminogen activator? Explain its mode of action with the help of diagram.

Q 17 Write a short note on factor VIII?

Q 18 What are the functions of erythropoietin?

Q 19 Write a note on rHuEPO and its applications?

Q 20 How monoclonal antibodies are produced?

Q 21 What are epitopes?

Q 22 Write a note on applications of OKT3 in tissue transplantation?

Q 23 Explain stem cells?

Q 24 Write a short note on *in vitro* clonal assay.

Q 25 Give a detailed account of long term marrow culture with its application?

Q 26 Write an extended note on embryonic stem cell culture.

Q 27 How chimeric mice are produced? Explain with the help of diagram.

Q 28 Write a short note on knockout mice.

Q 29 Explain tissue engineering with their objectives and applications?

Q 30 Write an essay on bioethics in animal genetic engineering?

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