

Subject: Pharmaceutical Biotechnology
Class : Third Year B.Pharm. (Sem-VI) R-2019

Question Bank

Q. I	Multiple Choice Questions.	(1 Mark Each)
1.	Which method is the easiest method of enzyme immobilization	
a)	Adsorption	
b)	Covalent bonding	
c)	Microencapsulation	
d)	Entrapment	
2.	Ligase enzymes are used	
a)	to join DNA strands	
b)	to cut DNA	
c)	for breaking phosphodiester bonds	
d)	for DNA sequencing	
3.	Interferon is	
a)	an antiviral protein	
b)	an antibacterial protein	
c)	a viral protein	
d)	a algae protein	
4.	Which of the following is not the correct statement for MHC Class I molecule.	
a)	It has $\alpha 1$, $\alpha 2$, $\alpha 3$ and $\beta 2$ domains	
b)	Expressed on almost all nucleated cells	
c)	Presenting antigen to CD8 ⁺ T cells	
d)	Both α and β chains are anchored in the cell membrane	
5.	Which is the correct flow chart of a biosensor	

a)	Bioreceptor-Biosample-Transducer-Display	
b)	Biosample-Bioreceptor-Transducer-Display	
c)	Transducer-Biosample-Bioreceptor-Display	
d)	Display-Biosample-Bioreceptor-Transducer	
6.	Enzyme immobilization is done	
a)	to reduce the activity of the enzyme	
b)	to protect the enzyme	
c)	to degrade the enzyme at a faster rate	
d)	to deactivate the enzyme	
7.	Ethics in biotechnology will help to	
a)	Reduce the cost of research	
b)	increase the use of lab. animals	
c)	Will lead to rational genetic experimentation	
d)	Increase the use of toxic chemicals	
8.	Which of the following is not obtained using Biotechnology	
a)	Insulin	
b)	Interferon	
c)	Golden rice	
d)	Diclofenac	
9.	Association of DNA and histone is mediated by _____	
a)	Covalent bonding	
b)	Hydrogen bonding	
c)	Hydrophobic bonding	
d)	Vander Waals interactions	
10.	In a Biosensor the bioreceptor cannot be _____	
a)	enzyme	

b)	cell	
c)	antigen	
d)	a non-biochemical substance	
11.	Enzyme immobilization is done because	
a)	It protects the enzyme	
b)	It changes the action of the enzyme	
c)	It reduces the rate of the reaction	
d)	It helps the enzyme to mutate	
12.	_____ is used as a monitoring device in the fermenter to measure agitator speed.	
a)	Flow meter	
b)	Rota meter	
c)	Pressure gauze	
d)	Tachometer	
13.	Following bioethics in biotechnology will	
a)	reduce the research work	
b)	increase the research work	
c)	lead to reduction in the number of NCES	
d)	lead to relatively environment friendly experimentation	
14.	Biosensors are developed for	
a)	Detection of an analyte	
b)	Increase the quantity of an analyte	
c)	Increase the rate of an enzymatic reaction	
d)	Mutating a gene	
15.	_____ is the most satisfactory plasma substitute.	
a)	Dextran	

b)	Glucose	
c)	Fructose	
d)	Sucrose	
16.	Northern blotting technique is used to identify _____	
a)	RNA	
b)	Protein	
c)	DNA	
d)	Lipid	
17.	Restriction enzymes are called as	
a)	Molecular glue	
b)	Molecular scissors	
c)	Molecular degraders	
d)	Molecular blockers	
18.	Biotransformations are structural modifications in a chemical compound by _____ that leads to the formation of molecules with relatively greater polarity.	
a)	Micro-organisms or enzymes	
b)	Virus	
c)	DNA	
d)	RNA	
19.	Which of the following is not the part of upstream fermentation process	
a)	Sterilization of nutrient medium	
b)	Sterilization of the fermenter	
c)	Addition of the microbial culture	
d)	Purification of the final product	
20.	Which of the following is a part of upstream process of fermentation	
a)	Isolation of the product from the fermentation medium	

b)	Separation of the nutrients form the final product	
c)	Sterilization of the fermenter before the start of fermentation	
d)	Packaging of the final product	
21.	Cloning Vectors are used in r DNA experiments to	
a)	Know the sequence of amino acids	
b)	Carry the gene into the host	
c)	Mutate the gene at a specific location	
d)	To know the sequence of the target gene	
22.	Function of MHC molecule is	
a)	to kill the antigen.	
b)	to produce antibodies against antigen.	
c)	to present the antigenic determinat peptide to immunological cells.	
d)	to neutralize the antigenic material.	
23.	Which bacteria is used as a host for obtaining insulin by r DNA technique	
a)	E. coli	
b)	B. Subtilis	
c)	M. Bovis	
d)	S. Typhi	
24.	Plasmid vectors are obtained from	
a)	Plants	
b)	animals	
c)	bacteria	
d)	Algae	
25.	The central dogma of life is	
a)	DNA-RNA-Protein	
b)	Protein-DNA-RNA	

c)	RNA-DNA-Protein	
d)	RNA-Protein-DNA	
26.	Which cloning vector is used for the production of insulin by r DNA technique	
a)	Cosmid	
b)	Plasmid	
c)	YAC	
d)	BAC	
27.	Which of the following is an extrachromosomal DNA	
a)	Plasmid	
b)	Cosmid	
c)	Shuttle vector	
d)	YAC	
28.	Restriction endonuclease enzyme	
a)	can recognise specific base sequence in a DNA	
b)	can join two genes	
c)	can join two RNA sequences	
d)	Can join two peptides	
29.	RFLP means	
a)	Resequenced fragment length polymorphism	
b)	Restriction fragment length polymorphism	
c)	Restriction fragment long polymorphism	
d)	Restriction fragment liquid polymorphism	
30.	Which of the following is a correct sentence about Covishield vaccine	
a)	It contains a viral vector	
b)	It is a subunit vaccine	
c)	It is a toxoid vaccine	

d)	It contains a peptide sequence of corona virus	
31.	By using DNA fingerprinting	
a)	A criminal can be identified	
b)	A protein sequence can be identified	
c)	A peptide sequence can be identified	
d)	A RNA sequence can be identified	
32.	_____ works as an antigen detector in cell mediated immunity.	
a)	Phagocytes	
b)	B-Cells	
c)	Receptors	
d)	MHC molecules	
33.	While selecting the nutrients for production of enzymes by fermentation which of the following is the primary factor	
a)	Cost of the nutrient	
b)	Requirement of the nutrient by the enzyme producing microorganism	
c)	Size of the fermenter	
d)	Cost of the fermenter	
34.	Which of the following is the correct sentence about sputnik vaccine	
a)	For the two doses of the vaccine two different vectors are used	
b)	Both the doses have the same vector	
c)	There are no vectors used in sputnik vaccine	
d)	It is a subunit vaccine	
35.	Sera are_____ types of Immunity	
a)	Naturally acquired active	

b)	Naturally acquired passive	
c)	Artificially acquired active	
d)	Artificially stimulated passive	
36.	Following ethics in biotechnology will	
a)	give freedom to research labs to carry out genetic experiments without ethical committee approval	
b)	make research labs to carry out genetic experiments after the ethical committee approval	
c)	give freedom to research labs to carry out experiments without biosafety inspections	
d)	give freedom to research labs to carry out experiments involving infectious microorganisms without ethical committee approval.	
37.	_____ works as an antigen detector in humoral immunity.	
a)	Phagocytes	
b)	B-Cells	
c)	Antibodies	
d)	MHC molecules	
38.	Which of the following is used as a host in the production of insulin using rDNA technology ?	
a)	B. Subtilis	
b)	S. Typhi	
c)	E. coli	
d)	M. Tuberculosis	
39.	Which Antibody is present in high concentration in serum	
a)	IgG	
b)	IgA	
c)	IgM	

d)	IgD	
40.	The first component of a biosensor as per the working diagram is	
a)	Display	
b)	Bioreceptor	
c)	Transducer	
d)	Signal Detector	
41.	Vaccines are _____ type of immunity	
a)	Naturally acquired active	
b)	Naturally acquired passive	
c)	Artificially acquired active	
d)	Artificially stimulated passive	
42.	_____ is the Antigen binding site of Antibody.	
a)	N terminus	
b)	C terminus	
c)	Disulphide bonds	
d)	H terminus	
43.	Which of the following is not the part of downstream process of fermentation	
a)	Sterilization of nutrient medium	
b)	Separation of the crude product from the nutrient medium	
c)	Purification of the product	
d)	Packaging of the isolated product	
44.	Which of the following antibody has a pentameric structure	
a)	IgG	

b)	IgA	
c)	IgM	
d)	IgD	
45.	Which of the following is an antiviral substance	
a)	Insulin	
b)	Interferon	
c)	Lipase	
d)	Amylase	
46.	Cosmid vector is obtained	
a)	from a bacteria only	
b)	from a virus only	
c)	by combining bacterial and viral genes	
d)	from a yeast	
47.	_____ vaccines are more stable below their freezing points.	
a)	Viral	
b)	Bacterial	
c)	Antitoxins	
d)	Combined	
48.	Interferons are _____ proteins	
a)	Antibacterial	
b)	Antiviral	
c)	Antifungal	
d)	Antimalarial	

49.	In the beads on a string model, the bead is made up of _____	
a)	6 histone proteins	
b)	8 histone proteins	
c)	6 histone proteins and DNA	
d)	8 histone proteins and DNA	
50.	Immunity transferred from mother to child is _____ Immunity	
a)	Naturally acquired active	
b)	Naturally acquired passive	
c)	Artificially acquired active	
d)	Artificially stimulated passive	
51.is not an example of an anticoagulant used in blood collection.	
a)	Heparin	
b)	Citrates	
c)	Tartrate	
d)	Disodium EDTA	
52.	When viral genome integrates into the bacterial genome it is known as _____	
a)	temperate phage	
b)	prophage	
c)	bacteriophage	
d)	episome	
53.	Antibody involved in Type I hypersensitivity reaction is	
a)	IgG	
b)	IgA	
c)	IgE	
d)	IgD	

54.	The distinct zig-zag appearance of the chromatin fiber is due to _____	
a)	Nucleosome	
b)	Histone H1	
c)	Histone core	
d)	Linker DNA	
55.	Which of the following cells of E.coli are referred to as F-	
a)	Male cells	
b)	Female cells	
c)	Both male and female cells	
d)	Neither male nor female cells	
56.	Biotransformations are structural modifications in a chemical compound by organisms /enzyme systems that leads to the formation of molecules with relatively _____	
a)	lesser polarity.	
b)	no polarity.	
c)	lipophilicity.	
d)	greater polarity.	
57.	The _____ biotechnology involves the use of microbial biotransformation for generating products of interest.	
a)	White	
b)	Green	
c)	Blue	
d)	Purple	
58.	_____ is not an example of an anticoagulant used in blood collection.	
a)	Heparin	
b)	Citrates	

c)	Tartrate	
d)	Disodium EDTA	
59.	Loop Fermentor is a type of	
a)	Mechanically stirred fermenter	
b)	Forced convection fermenter	
c)	Pneumatic fermenter	
d)	Tray fermenter	
60.	Blackstrap molasses is used as a _____ in fermentation media.	
a)	Nitrogen source	
b)	Carbon source	
c)	Mineral source	
d)	Antifoaming agent	
61.	_____ is used as Adjuvant in vaccine preparations.	
a)	Aluminum Oxide	
b)	Calcium Citrate	
c)	Calcium Phosphate	
d)	Calcium Carbonate	
62.	Aeration in fermentor is achieved by	
a)	Agitator	
b)	Impeller	
c)	Sparger	
d)	Baffles	
63.	Which of the following role is performed by a bacteriophage in transduction?	
a)	vector	

b)	donor	
c)	recipient	
d)	episome	
64.	_____ are used in fermenters for preventing vortex formation.	
a)	Baffles	
b)	Impellers	
c)	Propelars	
d)	Spargers	
65.	Microorganism used for the production of Vitamin B12 by fermentation method is	
a)	Penicillium chrysogenum	
b)	Aspergillus niger	
c)	Pseudomonas denitrificans	
d)	Saccharomyces cerevisiae	
66.	During a regular donation, you will give around _____ of whole blood.	
a)	420mL	
b)	100mL	
c)	1000mL	
d)	820mL	
67.	Sera are_____ immunity.	
a)	Naturally acquired passive	
b)	Naturally acquired active	

c)	Artificially stimulated passive	
d)	Naturally stimulated active	
68.	Microorganism used for the production of Citric acid by fermentation method is	
a)	Penicillium chrysogenum	
b)	Aspergillus niger	
c)	Pseudomonas denitrificans	
d)	Saccharomyces cerevisiae	
69.	_____ fermenter used for the production of Monoclonal antibodies	
a)	Air lift	
b)	Mechanically stirred	
c)	Bubble column	
d)	Tray	
70.	Which comparison between eukaryotic and prokaryotic genomes is true?	
a)	Prokaryotic genomes frequently have many transposable elements	
b)	Both types of genomes have large spacer regions between genes	
c)	Eukaryotic genes are often single and not in operons like prokaryotic genes	
d)	Both genomes are replicated in the nucleus	
Q. II	Descriptive Questions.	
1.	Explain any two methods of enzyme immobilization with diagrams	(06)
2.	Describe in detail the parts of a biosensor	(06)
3.	Describe the applications of biotechnology in pharmaceutical industries	(06)

4.	Write a short note on covishield & sputnik vaccine	(06)
5.	Enlist the various ELISA tests and explain any one in detail.	(06)
6.	Write about restriction enzymes in detail	(06)
7.	Draw a neat labeled diagram of an Antibody. Differentiate between Humoral and Cellular immunity.	(06)
8.	Explain the method of production of Monoclonal antibodies and write its applications.	(06)
9.	Explain the method of production of amylase enzyme by fermentation	(06)
10.	Enlist any three cloning vectors and explain plasmid cloning vector in detail	(06)
11.	Draw and explain the diagram of MHC molecules and comment on its function.	(06)
12.	Classify the types of fermentor. Explain in detail Mechanically stirred tank fermentor.	(06)
13.	What is PCR?	(06)
14.	Write about ethics in biotechnology	(06)
15.	Define Hypersensitivity reaction, enlist the types and explain any one in detail	(06)
16.	Explain in detail any one method of DNA sequencing	(06)
17.	Write a short note on covishield & sputnik vaccine	(06)
18.	What is RFLP? Describe gene therapy in detail	(06)
19.	Explain General method of vaccine preparation.	(06)
20.	Define Mutation and write a short note on Induced mutation.	(06)
21.	Describe gene therapy in detail and explain it's applications	(06)
22.	Write a note on transgenic plants and animals	(06)
23.	Describe the working of biosensor	(06)
24.	Explain what is protein engineering	(06)
25.	Draw and explain structure of MHC class-I and Class-II molecules.	(06)

26.	Enlist methods of fermentation and explain any one in detail.	(06)
27.	What is gene therapy? give some examples	(06)
28.	Explain in detail production of Griseofulvin by fermentation	(06)
29.	Draw and explain structure of MHC molecules.	(06)
30.	Explain the methods of Fermentation and Comment on the Aeration process in Fermentor.	(06)
31.	Draw a neat labeled diagram of Fermenter and enlist the process controls.	(06)
32.	What do you mean by Plasma Substitutes ? enlist their properties.	(06)
33.	Enlist the blotting techniques and explain any one in detail.	(06)
34.	Explain with applications methods of enzyme immobilization	(06)
35.	Define Sera. Explain the process of production of Diphtheria antitoxin in detail.	(06)
36.	Enlist the types of mutation and explain any one in detail.	(06)
37.	What is a mutation and explain any one in detail.	(06)
38.	Differentiate between Humoral and Cellular immunity.	(06)
39.	Describe cosmid cloning vector in detail	(06)
40.	Explain Seed lot system of vaccine production. Comment on Storage and stability of vaccines.	(06)
41.	Write a short note on Plasma Substitutes	(06)
42.	Explain the role of ethics in Biotechnology	(06)
43.	Draw a neat labeled diagram of a large scale fermenter and comment on various controls of the fermentation process.	(06)
44.	What are ligase enzymes? Explain restriction enzymes with examples	(06)
45.	Write a short note on microbial biotransformation and enlist its application	(06)
46.	What is DNA fingerprinting ? write a note on RFLP?	(06)
47.	Explain the process of production of Sera.	(06)
48.	Explain any one method for transfer of DNA form one bacteria to other	(06)

49.	Write a short note on Storage of Whole Blood.	(06)
50.	Explain any one method of DNA sequencing	(06)