Time: 3 Hrs **Marks: 75**

Q. 1 Attempt all multiple-choice questions (MCQ) **20M**

Sr No	Questions		Options
1	Selection of suitable_____allows targeting of drugs to diseased cells expressing glycans on the cell surface	a	folate
		b	transferrin
		c	lectins
		d	peptides
2	Which of the following is true about passive targeting	a	they do not target systemic circulation
		b	they utilize natural course of biodistribution
		c	they are delivered exclusively to the organ
		d	they are ligand mediated
3	Drugs with low therapeutic index are effective as targeted DDS because they can be used at	a	Low drug concentration
		b	High drug concentration
		c	Moderate drug concentration
		d	Variable drug concentration
4	Targeting drugs to specific organs is called as	a	Spatial placement
		b	Temporal delivery
		c	Temporal placement
		d	Spacious placement
5	Liposome structure has a _____ tail	a	hydrophilic
		b	hydrophobic
		c	amphiphilic
		d	amphipathic
6	All of the following are methods of preparation for nanoparticles except	a	Solvent evaporation method
		b	Emulsion polymerization
		c	Ethanol injection method
		d	Interfacial polymerization
7	_____ are vesicular drug delivery systems	a	Liposomes
		b	Nanoparticles
		c	Microspheres
		d	Nanospheres

8	Which of the following is a polysaccharide used as polymer to prepare nanoparticles	a	Gelatin
		b	Lectin
		c	Dextran
		d	Albumin
9	The following is the polymer of synthetic origin used for preparation of microspheres	a	Agarose
		b	Acrolein
		c	Collagen
		d	Carrageenan
10	The following method of preparation is used in the preparation of niosomes	a	Double emulsion technique
		b	Interfacial polymerization
		c	Hand shaking method
		d	Phase separation coacervation technique
11	Epitope is a _____	a	part of antigen that is recognized by the antibody
		b	area in the antibody which binds to antigen
		c	complex formed by binding of antibody to antigen
		d	variable region on the antibody
12	The following antibodies are the most immunogenic in humans and have tendency to elicit a maximum human antimouse antibody (HAMA) response	a	Murine antibodies
		b	Chimeric antibodies
		c	Humanized antibodies
		d	Human antibodies
13	The following factors are governed by Aerosol design except	a	Airway calibre
		b	Droplet size
		c	Shape
		d	Velocity
14	The _____mechanism can improve the deposition of highly charged aerosols	a	Interception
		b	Electrostatic precipitation
		c	Sedimentation
		d	Diffusion

15	_____ employs a multidose reservoir of drug wherein dose is metered into small conical cavities by twisting a grip at the base of the device and on inhalation air is ducted through cavity and dose is dislodged	a	Turbuhaler
		b	Spinhaler
		c	Rotahaler
		d	Easyhaler
16	Lung is an attractive organ to administer proteins and peptides because of	a	high enzymatic activity
		b	invasive administration by inhalation
		c	extensive vasculature and thin alveolar epithelium
		d	low permeability
17	Gene expression involves	a	Only Transcription
		b	Only Translation
		c	Only Splicing
		d	Transcription and Translation
18	Introducing healthy genes into cells cultured *in vitro* and reimplanting into the patient is referred to as	a	*ex vivo* therapy
		b	germ line therapy
		c	somatic cell therapy
		d	*in vivo* therapy
19	Antisense technology interrupts the ___phase of protein production	a	Transcription
		b	Splicing
		c	Folding
		d	Translation
20	The SELEX technology used to obtain Aptamers stands for	a	Systematic evolution of ligands by exponential enrichment
		b	Secondary evaluation of ligands by exploratory evolution

		c	Systematic enrichment of ligands by exponential evaluation
		d	Secondary evolution of ligands by exploratory enrichment

Q.2: Attempt any two out of three (20 M)

i)		Enlist advantages of targeted drug delivery and explain in brief lymphatic uptake of drug molecules.	10M
ii)	a	What are Liposomes. Discuss any four methods for the evaluation of liposomes.	5M
	b	Elaborate on the polymers used to manufacture nanoparticles.	5M
iii)	a	List out the evaluation parameters for microspheres and discuss in detail any one evaluation parameter.	5M
	b	List out the method of preparation of microspheres and explain in detail any one based on emulsion technique.	5M

Q.3: Attempt any seven out of nine (35 M)

i)	Write in brief with examples on the levels of drug targeting.	5M
ii)	Discuss the advantages, disadvantages and applications of Nanoparticles.	5M
iii)	Elaborate on the method of preparation of microspheres based on spray drying and spray congealing technique.	5M
iv)	Describe any two applications of niosomes in drug delivery.	5M
v)	Give a detailed account of metered dose inhalers.	5M
vi)	Summarize salient features of any three *in vivo* nasal absorption models and give any one general limitation of these models.	5M
vii)	Write in brief on the *ex vivo* gene therapy approach.	5M
viii)	Explain any two viral vectors used for gene therapy.	5M
ix)	Explain the concept and any two applications of antisense therapy.	5M

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