Time: 3 Hrs **Marks: 75**

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

Sr No	Questions		Options
1	The body's natural immune system is used in which type of targeting	a	Passive
		b	Active
		c	Dual
		d	Physical
2	The lymph is involved in following important function	a	Transport oxygen to the blood
		b	Transport carbon-dioxide to the lungs
		c	Return RBCs to lymph nodes
		d	Return interstitial fluid to the blood
3	Immunoglobulin clusters on the surface of the target cells expose tail region which is recognized by _____receptors present onmacrophages.	a	Interferon
		b	Fc
		c	Antibodies
		d	lectins
4	In case of cancer cells, there is____ expression of cell surface receptors as normal cells.	a	over
		b	similar
		c	reduced
		d	unaffected
5	A lipid bilayer structure that encloses an internal aqueous volume	a	Niosomes
		b	Liposomes
		c	Solid Lipid Nanoparticle
		d	Nanoparticle
6	LDC stands for _____ in nanoparticle technology	a	Lipid Drug Conjugates
		b	Lyophobic Drug Complex
		c	Lyophilic Drug Complex
		d	Lipid Drug Concentration

7	For the preparation of _____ ether injection method is used	a	Monoclonal antibodies
		b	Nanoparticles
		c	Transferosomes
		d	Liposomes
8	Which of the following is a natural polymer used in nanoparticles	a	PLGA
		b	Polycaprolactone
		c	Alginates
		d	Polystyrene
9	The following polymerization technique for preparation of microspheres is also referred as bead or pearl polymerization	a	Bulk polymerization
		b	Emulsion polymerization
		c	Suspension polymerization
		d	Interfacial polymerization
10	The following is a non-biodegradable polymer used in the preparation of microspheres	a	Glycidyl methacrylate
		b	Polyalkyl cyano acrylates
		c	Polyanhydrides
		d	Lactides and glycolides and their copolymers
11	Non-ionic surfactant based vesicles are _____	a	Liposomes
		b	Microspheres
		c	Niosomes
		d	Microcapsules
12	The following technique employs chemical cross-linking agents during preparation of microspheres of natural polymers	a	Spray drying
		b	Spray congealing
		c	Solvent extraction
		d	Single emulsion technique
13	_____ attached assists patients in coordination with the MDI and can reduce undesirable orophayngeal deposition.	a	Spacer mouthpiece
		b	Metering chamber
		c	Actuator
		d	Metering valve

14	In _____mechanism of aerosol deposition, greater the mass, particle mobility and initial velocity will have increased chances of hitting the obstacle in front of it.	a	Inertial impaction
		b	Sedimentation
		c	Electrostatic precipitation
		d	Diffusion
15	The _____employs packaging consisting of individual doses of a drug in blister packs on a circular cassette	a	Diskhaler
		b	Spinhaler
		c	Rotahaler
		d	Easyhaler
16	The following factors of dosage form affect the pharmacokinetics and bioavailability of drugs following intranasal administration except	a	physicochemical properties of excipients
		b	toxicity of dosage form
		c	concentration of active drug
		d	speed of mucus flow
17	Identify the chemical method to enhance delivery in gene transfer	a	Sonoporation
		b	Magnetofection
		c	Lipoplexes
		d	Microinjections
18	A commonly used vector in gene therapy to carry target gene into host cells is	a	Bacteria
		b	Fungi
		c	Eukaryotic cells
		d	Virus
19	All of the following are true about Aptamers except	a	they are oligonucleotides
		b	they can be deactivated
		c	they are non-specific
		d	they can be modified
20	_____ are the backbone of antisense therapy	a	Nucleic acids
		b	Lipids
		c	Carbohydrates
		d	Proteins

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

i)	a	Explain rationale for target oriented drug delivery system and state the advantages of such type of system.	5M
	b	Enlist approaches for tumor targeting and explain the "Enhanced Permeability and Retention" effect.	5M
ii)	a	What are nanoparticles. Explain in detail evaluation of nanoparticles.	5M
	b	Classify Liposomes. Discuss any two methods for the preparation of liposomes.	5M
iii)	a	Give a detailed account of nebulizers.	5M
	b	Summarize any three factors affecting absorption of intranasal drug delivery systems.	5M

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

i)	Discuss in detail the factors affecting targeted drug delivery systems.	5M
ii)	List out the methods of characterization of microspheres and explain any one method in detail.	5M
iii)	List out the methods of preparation of niosomes and explain any one method in detail.	5M
iv)	Write in brief on any two pharmaceutical applications of monoclonal antibodies.	5M
v)	Write a short note on *ex vivo* nasal perfusion model and mention any one application of same.	5M
vi)	Summarize any three factors governing particle deposition in lungs governed by aerosol design.	5M
vii)	Elaborate on the concept and applications of Aptamers.	5M
viii)	How do antisense oligonucleotides act? Discuss any two applications of Antisense therapy.	5M
ix)	State the meaning of somatic gene therapy and discuss any one approach for the same.	5M

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