Id	**1**
Question	Conventional filter is used for
A	separation of solids
B	Immissible particles
C	It is physical separation
D	All of the above

Id	**2**
Question	Dissolved Organics are a) Trihalomethanes, b) Heavy metals, c) Clay, d) Humic acids
A	Option a & d
B	Option b & c
C	Option a & c
D	Option c & d

Id	**3**
Question	Which is the smallest size of particle in Microns if you want to perform membrane separation?
A	Bacteria
B	Yeast cell
C	Ferric iron
D	Human hair

Id	**4**
Question	Membrane can be a) Gaseous, b) Liquid, c) Solid, d) Combination of all
A	Option c only
B	Option d only
C	Option a & c
D	All Options a, b, c & d

Id	**5**
Question	A region of continuity interposed between two phases is known as membrane
A	Information is not enough
B	TRUE
C	FALSE
D	Don't know

Id	**6**
Question	The membrane has ability to transport one comonent more readily than other because of differences in
A	Physical properties
B	Chemical Properties
C	Option A & B
D	Don't know

Id	**7**
Question	Transport through the membrane takes place as a result of a
A	Driving force
B	Temperature difference
C	Membrane nature
D	Membrane material

Id	**8**
Question	Which approximate range of molecular size can be separated using Ultra-filtration membranes
A	< 500000
B	20000-100000
C	1000-10000
D	> 200

Id	**9**
Question	Synthetic dyes can be membrane filtered out using
A	Micro-filtration
B	Ultra-filtration
C	Nano-filtration
D	None of the above

Id	**10**
Question	Undissociated acids and mono-valent slats canbe membrane separated using
A	Reverse Osmosis membranes
B	Nano-filtration membranes
C	Ultra-filtration membranes
D	Micro-filtration membrnaes

Id	**11**
Question	Pore-flow micro-porous membranes are
A	Reverse Osmosis membranes
B	Nano-filtration membranes
C	Ultra-filtration membranes
D	Micro-filtration membrnaes

Id	**12**
Question	1.0 – 5.0 bar is the range of trans-membrane pressure used as operating pressure for
A	Nano-filtration membranes
B	Ultra-filtration membranes
C	Micro-filtration membranes
D	Reverse Osmosis membranes

Id	**13**
Question	Flux range (in $l.m^2, h^{-1}, bar^{-1}$) of pressure driven Reverse Osmosis (RO) membranes is
A	>50
B	10/01/50
C	01/04/12
D	0.05-1.4

Id	**14**
Question	Unit of flux in membrane separation process is
A	$l.m^{3},h^{-1},bar^{-1}$
B	$l.m^{2},h^{-1},bar^{-2}$
C	$l.m^{2},h^{-1},bar^{-1}$
D	$l.m^{-2},h^{1},bar^{1}$

Id	**15**
Question	In membrane gas separation the two phases are getting separated are
A	Liquid - Gas
B	Gas - Gas
C	Gas - Liquid
D	Non of the above

Id	**16**
Question	Driving force in pervaoration is
A	Pressure difference
B	Temperature difference
C	Concentration difference
D	Electric force difference

Id	**17**
Question	In membrane distillation driving forces are
A	Temperature difference and Pressure difference
B	Concentration difference and Pressure difference
C	Concentration difference and Pressure difference
D	Only Concentration difference

Id	18
Question	Pressure difference is the driving force for a) Reverse Osmosis b) Peizodialysis c) Dialysis d) Membrane Contactors
A	Option d only
B	Option b & c
C	Option a only
D	Option a & b

Id	**19**
Question	J = -A (dX/dx) Where A is
A	Driving force
B	Permeation rate
C	Phenomenological coefficient
D	Membrane thickness

Id	**20**
Question	Permeability with respect to any species is defined as the ratio of the
A	Flux per unit time
B	Flux to the driving force
C	Driving force to the flux
D	None of the above

Id	**21**
Question	Flux across a membrane is expressed in terms of
A	Pressure applied per unit volume
B	Volume per unit time & area
C	Volume per unit pressure & time
D	Pressure applied per unit molar concentration

Id	**22**
Question	Ratio of permeabilities for binary mixture is
A	Membrane flux
B	Membrane permeability
C	Membrane selectivity
D	Trans membrane flux

Id	**23**
Question	Membrane properties are variable and can be adjusted
A	TRUE
B	FALSE
C	Don't know
D	Information is not enough

Id	**24**
Question	Concentration polarization / membrane fouling is drawback of membrane technology
A	FALSE
B	Can not be concluded
C	TRUE
D	Information is not enough

Id	**25**
Question	Asymmetric, composite membranes have
A	High permeability and high separation factor
B	High permeability and low separation factor
C	Low permeability and high separation factor
D	Low permeability and Low separation factor

Id	**26**
Question	Operations at Temp > 200 ºC and /or with chemically active mixtures require use of membranes made of
A	Polymeric materials
B	Organic materials
C	Inorganic materials
D	Dense membranes

Id	**27**
Question	Micro-porous membranes have
A	High permeability and Low selectivity
B	High permeability and high selectivity
C	Low permeability and Low selectivity
D	None of the above

Id	**28**
Question	Symmetric membranes have
A	Integrally skinned membranes
B	Cylindrical porous
C	Non integrally skinned
D	Don't know

Id	**29**
Question	Anisotropic membranes are
A	Non porous dense membranes
B	Thin-film composites
C	Electrically charged
D	Supported liquid membranes

Id	**30**
Question	In 1958-1960 Sourirajan, Lobe experimented heat treatment to the commercially available UF membranes which results in
A	Shrinkage of pore size – gives better rejection and Symmetry – gives low flux
B	Shrinkage of pore size – gives low rejection and Asymmetry – gives low flux
C	Increase of pore size – gives better rejection and Asymmetry – gives higher flux
D	Shrinkage of pore size – gives better rejection and Asymmetry – gives higher flux

Id	**31**
Question	Isotropic membranes have
A	Pores of uniform size on the top layer only
B	Pores are not of uniform size
C	Pores of uniform size throughout the body of the membrane
D	Pores changes in size from one surface to the other

Id	**32**
Question	Non-integrally skinned membranes are
A	Homogeneous skin without support layers
B	Composite skin with support layers
C	Composite skin without support layers
D	Homogeneous skin with support layers

Id	**33**
Question	Natural polymers are
A	Polyporpylene, Wool
B	Cellulose, Rubber, Wool
C	Polyethylene, Cellulose, Rubber
D	None of the above

Id	**34**
Question	Inorganic materials for membrane synthesis are
A	3 dimensional, highly crossed-linked structure
B	Metals with branched chain
C	Long linear chain & branched chain
D	Metals, ceramic and glass material

Id	**35**
Question	Glassy polymers
A	Highly crossed-linked, brittle
B	Glassy and brittle
C	Hard and stiff
D	Soften at high temperature

Id	36
Question	If the glass transition temperature is reached of crystalline polymers then polymer becomes a melt
A	TRUE
B	FALSE
C	It becomes rubbery
D	Non of the above

Id	**37**
Question	Polycarbonates are
A	Highly crystalline
B	Easily deformed
C	Thermoplastics
D	Obtained from rubber plants

Id	**38**
Question	Polyimides are
A	High resistance to heat and excellent water resistant
B	Linear, amorphous
C	High strenght
D	Highly crystalline

Id	**39**
Question	Desirable characteristics of membranes are a) Good permeability and high selectivity b) Stability and freedom from fouling c) Ability to withstand large pressure differences across membrane thickness d) chemical and mechanical compatibility with its environment
A	Option a & d
B	None of the above options
C	All of the above options
D	Option a, c & d

Id	**40**
Question	FO menas
A	Front Osmotic pressure
B	Forward osmosis pressure
C	For osmotic
D	Forward osmosis

Id	**41**
Question	The upper layer thickness of asymmetric composite membranes is
A	< 50µm
B	> 0.1 µm
C	0.1 to 0.5 µm
D	10 to 50 µm

Id	**42**
Question	Micro-porous membranes have
A	Absolute rating
B	Nominal Rating
C	Thin skin on the surface
D	Asymmetric in nature

Id	**43**
Question	MWCO means
A	Molar weight of cross-organised membranes
B	Molar weight of cut off
C	Molecular weight cut off
D	Molecular weight of cross-organised membranes

Id	**44**
Question	Absolute rating means
A	Reject all the particles larger than that rating
B	MWCO above which a certain percentage of solute will be retained by the membrane
C	Pass all the particles larger than that rating
D	MWCO below which a all the solute will be passed by membranes

Id	**45**
Question	Al_2O_3 ceramic membranes are
A	Thin film composites membranes
B	Symmertic membranes
C	Asymmertic membranes
D	None of the above

Id	**46**
Question	In depth filters particle removal occurs
A	By retaining them on the surface
B	By fouling
C	Within the depths of filter material
D	Non of the above

Id	**47**
Question	Use of membrane technology is very energy intensive process
A	TRUE
B	FALSE
C	Information is not enough
D	Don't Know

Id	**48**
Question	Up-scaling of membrane technology is
A	Easy
B	Non linear
C	Very difficult
D	Tedious process

Id	**49**
Question	Relative selectivity α_{AB} of species A vs B is
A	Q_A / Q_B
B	Q_B / Q_A
C	$Q_A X Q_B$
D	$Q_B X Q_A$

Id	**50**
Question	Greater than 10 μm is
A	Ultra-filtration
B	Micro-filtration
C	Dialysis
D	Conventional filtration

Id	**51**
Question	Membrane filtration can separate
A	Immiscible solids
B	Dissolved solids
C	Solids only
D	Gas only

Id	**52**
Question	The key to an efficient and economical membrane separation is the
A	Properties of membrane used
B	It's MWCO
C	Membrane and the manner in which it is packaged and modularized
D	Its application

Id	**53**
Question	Polycarbonate is
A	Glassy polymer
B	Rubbery polymer
C	Crystalline polymer
D	Natural polymer

Id	54
Question	Polytetrafluoroethylene is
A	Polyimide
B	Teflon
C	Aromatic polyamide
D	Polyisoprene

Id	**55**
Question	Symmetric membranes have
A	Through and through cylindrical porous structure
B	Interconnected structure
C	Top layer is dense membrane surface
D	Bottom layer is having very fine porous as compare to top layer

Id	**56**
Question	When the diffusion rate is low and selectivity is high the membranes are
A	Composite membranes
B	Asymmetric membranes
C	Micro porous membranes
D	Dense amorphous membranes

Id	**57**
Question	Membrane processes can not be easily combines with other separation processes
A	TRUE
B	FALSE
C	Difficult to combine
D	Don't know

Id	**58**
Question	Darcy's law defines the volume flux which is
A	Kinetic viscosity coefficient
B	Diffusion coefficient
C	Permeability coefficient
D	Pressure coefficient

Id	59
Question	In nanofiltration range of separation of materials is in the following range
A	> 1 nm
B	1 – 10 nm
C	10 – 100 nm
D	100 – 1000 nm

Id	**60**
Question	Undissociated acids and monovalent salts can be separated in
A	Ultra-filtration
B	Nano-filtration
C	Reverse Osmosis
D	Can not be separated by membranes

Id	**61**
Question	Dense polymeric membranes can be used for
A	Micro-filtration
B	Ultra-filtration
C	Liquid membranes
D	Gas separation / pervaporation

Id	**62**
Question	In nonporous membranes separation depends on
A	Pore size distribution
B	Intrinsic properties of membranes
C	Affinity and reactivity of membranes
D	Available mobile carrier and fixed carrier sites

Id	**63**
Question	Biological membranes are
A	Cell membranes / lungs
B	Rubbery
C	Organic polymeric
D	Phase inversion membranes

Id	**64**
Question	The selection of a type of material for membrane preparation is dependent on the a) cost, b) separation task, c) desired structure of the membrane d) operating conditions under which it has to perform.
A	Option b, c, d
B	Option a, c, d
C	All of the options
D	None of the options

Id	**65**
Question	Porosity of membranes prepared by sintering method is
A	More than 50 %
B	Less than 5%
C	50 – 70 %
D	10 – 20 %

Id	**66**
Question	In stretching of extruded film
A	Film is extruded perpendicular to extrusion & crystalline orientation
B	Film is extruded parallel to extrusion
C	Film is stretched over its crystalline orientation
D	None of the above

Id	**67**
Question	In stretching of polymers for membrane preparation is of pore size of
A	1 – 5 nm
B	0.1 – 3 µm
C	50 – 100 µm
D	< 5 nm

Id	**68**
Question	In Track-etching process of membrane preparation thin polymers will be exposed
A	Parallel to a high energy beam
B	Perpendicular to high energy beam
C	At an angle of 45° to low energy beam
D	Perpendicular to low energy beam

Id	**69**
Question	In phase inversion method of membrane preparation a polymer transformed in a controlled manner from
A	Solid to liquid
B	Solid to solid
C	Liquid to solid
D	Non of the above

Id	**70**
Question	In phase inversion method of membrane preparation the solidification initiated by the transition from
A	Liquid state into two liquids (liquid – liquid demixing)
B	Solid state into two liquids (liquid – liquid demixing)
C	Liquid state into liquid – solid demixing
D	Solid state into liquid – solid demixing

Id	**71**
Question	In thermal precipitation of phase inversion technique polymer solution is
A	Heated to enable phase separation
B	Cooled to enable phase separation
C	First heated and then cooled to enable phase separation
D	First cooled and then heated to enable phase separation

Id	**72**
Question	In immersion precipitation after polymer solution is casted on support it is immersed in a coagulation bath containing
A	Solvent of dope
B	Solvent of polymer solution
C	Non-solvent
D	None of the above

Id	**73**
Question	In immersion precipitation technique membrane structure results from a combination of
A	Heat transfer and pressure difference
B	Phase separation and momentum transfer
C	Heat and mass transfer
D	Mass and phase separation

Id	**74**
Question	Most of the commercial asymmetric membranes are prepared by
A	Immersion precipitation
B	Track etching
C	Extrusion
D	Thermal precipitation

Id	**75**
Question	Flat sheet membranes preparation parameters are a) Solvent/Solvent & Non-solvent b) Polymer concentration c) Casting thickness d) Humidity and temperature e) Additives f) Evaporation time
A	Option a, c, e only
B	Option b, d, f only
C	All of the above
D	Except option e all other options

Id	**76**
Question	In preparation of flat sheet membrane casting knife is used to
A	Coat the dope on membrane
B	Control the thickness of dope coat on baking material
C	To prepare composite coating on membranes
D	None of the above

Id	**77**
Question	Viscosity of polymer dope solution will decide the tightness or looseness of membrane
A	TRUE
B	FALSE
C	Viscosity is not deciding factor
D	Don't know

Id	**78**
Question	In general non-solvent used in immersion precipitation of phase inversion method is
A	Organic solvent
B	Water
C	50% Mixture of water and solvent
D	Some times inorganic solvents

Id	**79**
Question	In track-etching process membrane pores are
A	Inter-connected
B	Dense pores
C	Angled pores
D	Capillary pores

Id	**80**
Question	In carrier mediated transport membranes separation depends on
A	Affinity and reactivity of membranes
B	High selectivity
C	Pore size distribution
D	None of the above

Id	**81**
Question	Tubuler form of membranes are a) Track-etching membranes b) Capillary membranes c) Spiral wound membranes d) Hollow fiber membranes
A	Option a & c
B	Option b & d
C	Option b & c
D	None of the option

Id	**82**
Question	Hollow fiber membranes are having
A	Dia < 0.5mm and are self suppported
B	Dia > 1 mm and are on support
C	Dia is between 1 – 5 mm
D	Dia < 5 mm and are self supported

Id	**83**
Question	HF membranes means
A	High fiber membranes
B	Hollow full membranes
C	High length membranes
D	Hollow Fiber membranes

Id	**84**
Question	Dry-wet hollow fiber spinning process is
A	Immersion precipitation method
B	Track-etching process
C	Coating of dope on hollow tube
D	Extrusion stretching process

Id	85
Question	To make hollow fiber membranes dope solution is
A	Coated on hollow tube
B	Passing through spinneret to make it hollow
C	Coating is controlled by knife
D	None of the above

Id	**86**
Question	In spinneret the dope is
A	Inside the tube
B	Out side the tube
C	Covered by inside by bore solution
D	Bore solution is not used

Id	**87**
Question	For reparation of hollow fiber membranes following parameters are necessary to take in to consideration a) Extrusion rate of the polymer solution b) Flow rate of the bore liquid c) Dimensions and types of the spinneret d) Temperature of the coagulation bath
A	None of the above
B	Option a, c, d only
C	Option b, c, d only
D	All of the above

Id	**88**
Question	In tubular membrane casting casting bob will act as
A	Reservoir of dope solution
B	Casting of polymer
C	Guiding the dope solution to cast on supported tube
D	To regulate air pressure

Id	**89**
Question	The supported tube in tubular membranes is
A	Made up of polymer tube
B	Porous tube
C	Nonorous tube
D	Nonwoven material tube

Id	**90**
Question	After casting of dope solution on tubular porous tube the coating tube
A	Put in oven to dry
B	Non of the option
C	Dipped in organic solvent bath of the dope solution
D	Dipped in coagulation bath

Id	**91**
Question	The relationship among dope composition and membrane morphology says that delayed demixing gives
A	Composite bottom layer
B	Dense top layer
C	Microporous top layer
D	Micro-voids at bottom layer

Id	**92**
Question	The relationship among dope composition and membrane morphology says that instantaneous demixing gives
A	Composite bottom layer
B	Dense top layer
C	Microporous top layer
D	Micro-voids at bottom layer

Id	**93**
Question	In membrane morphology is a function of 'k' ratio, which defines as
A	Dope viscosity / membrane porosity
B	Solvent inflow / coagulant out flow
C	Coagulant influx / solvent outflow
D	Solvent outflow / coagulation influx

Id	**94**
Question	In membrane preparation ratio of 'k' is function of
A	Pressure & casting thickness
B	Temperature & dope viscosity
C	Pressure & dope viscosity
D	Casting thickness & Temperature

Id	**95**
Question	During choice of solvent & nonsolvent selection for membrane preparation high mutual affinity pairs gives
A	Instant demixing and porous membrane morphology
B	Instant demixing and nonporous membrane morphology
C	Delayed demixing and nonporous membrane morphology
D	Delayed demixing and porous membrane morphology

Id	**96**
Question	During choice of solvent & nonsolvent selection for membrane preparation low mutual affinity pairs gives
A	Instant demixing and porous membrane morphology
B	Instant demixing and nonporous membrane morphology
C	Delayed demixing and nonporous membrane morphology
D	Delayed demixing and porous membrane morphology

Id	**97**
Question	Which of following factors promotes the formation of porous membrane morphology a) Low polymer concentration b) High polymer concentration c) Low mutual affinity between solvent / nonsolvent d) Addition of nonsolvent to the polymer solution e) Vapour phase instead of coagulation bath
A	Option a, d & e
B	Option a, c, d, e
C	All of the above opptions
D	Options b, c, d& e

Id	**98**
Question	In formation of integrally skinned membranes
A	Top layer is thick & defect free
B	Top layer is thin & defect free
C	Bottom layer is thin with microvoides
D	Bottom layer is thick

Id	**99**
Question	Top layer thin & defect free is getting formed in integrally skinned membranes because of
A	High viscosity of dope solution
B	Low viscosity of doe solution
C	Delayed demixing
D	Instantaneous demixing

Id	**100**
Question	In asymmetric membranes formation of microvoids can be observed in
A	Bottom of membrane
B	Top layer of membrane
C	Porous sub-layers
D	None of the above

Id	**101**
Question	Formation of microvoids leads to
A	Strong membrane structure for high pressure applications
B	Weak spots for membrane for high pressure
C	Thick membrane morphology
D	Membranes can not with stand for water purification applications

Id	**102**
Question	Composite membranes are prepared by following techniques a) Dip-coating b) Extrusion c) Spray coating d) Track-etching e) In-situ polymerization
A	Option b, d & e
B	Option a, b, c & e
C	Option a, c & e
D	Option b, c & d

Id	103
Question	Which are two different types of characterization methods for porous membranes
A	Structure related & permeation related
B	Structure related only
C	Permeation related only
D	None of the above

Id	**104**
Question	Flux and retention measurement of any membrane gives information about
A	Pore size distribution
B	Surface morphology
C	Permeability & selectivity
D	Top layer thickness & surface porosity

Id	**105**
Question	Infrared spectroscopy of prepared membrane gives information about
A	Pore size distribution
B	Surface porosity
C	Permeability
D	Functional group analysis of membrane surface

Id	**106**
Question	Measurement of bubble pressure to understand maximum pore size of prepared membrane is
A	Dynamic & non destructive method
B	Static & destructive method
C	Dynamic & destructive method
D	Static & non destructive method

Id	**107**
Question	If pore size is increases the required pressure for membrane operation is
A	Increases
B	Decreases
C	Independent of pore size
D	Remains same if pore size increases or decreases

Id	108
Question	In bubble point method for membrane characterization air bubble will penetrate through the pore when its radius is
A	Less than that of the pore
B	More than that of the pore
C	Equal to that of the pore
D	Independent of the pore

Id	**109**
Question	For gas adsorption-desorption method of membrane characterization generally following gases are used
A	Mercury & helium
B	Nitrogen & argon
C	Hydrogen-sulfide & carbon dioxide
D	Water vapors and benzene

Id	**110**
Question	Permporometry is suitable method for determination of size distribution of active pores for
A	Asymmetric and composite membrane structure
B	Loose micro porous membrane structure
C	Ultra-filtration Membranes
D	Micro-filtration Membranes

Id	**111**
Question	Because of experimental difficulties permporometry is more
A	Difficult method for membrane characterization
B	Complicated method for membrane characterization
C	Easy method for membrane characterization
D	Don't know

Id	**112**
Question	Solute rejection method is also known as
A	Bubble point method
B	Liquid displacement method
C	MWCO measurement
D	Permporometry method

Id	113
Question	For nonporous membranes following techniques are used to characterize membranes
A	Permeability, Surface analysis & physical properties
B	Surface analysis only
C	Permeability only
D	Surface analysis & physical analysis

Id	**114**
Question	For surface analysis of prepared membranes following methods are used a) XRD b) DSC c) FTIR d) SEM/TEM e) ESCA f) AFM
A	Option a, c, d
B	Option d, e, f
C	Option a, b, c
D	Option b, c, e

Id	**115**
Question	When membrane gives sharp cut off of any particular species means
A	Membranes are tight membranes
B	Membranes are loose membranes
C	Can not measure the MWCO
D	Independent of MWCO

Id	**116**
Question	The advantage of permporometry method is that
A	Number of non active pores can be calculated
B	Easy to understand the surface morphology
C	Gives information about cross sectional transmembrane pressure
D	Only active pores can be characterized

Id	**117**
Question	Mercury intrusion porosimetry is applicable to pores from
A	1000 A – 5000 A diameter
B	30 A – 900 A diameter
C	Less than 30 A diameter
D	Greater than 5000 A diameter

Id	**118**
Question	For asymmetric membranes most pore cross-sections of pore diameter are irregular
A	TRUE
B	FALSE
C	Independent of pore diameter
D	Independent of pore size

Id	**119**
Question	Membranes prepared by plasma polymerization are
A	Thick membranes
B	Highly loose membranes & are pinhole free
C	Highly dense & pinhole free
D	There are more pinholes than any other membranes

Id	**120**
Question	For membrane surface modification after casting of membranes cross linking is one of the method commonly used
A	FALSE
B	TRUE
C	Don't know
D	Do not required any surface modification post casting of membranes

Id	**121**
Question	Common membrane shapes are a) Flat sheet b) Tubular c) Hollow fiber d) Monolithic e) Spiral wound
A	Option a, b, c & d
B	Option a & d only
C	All of the above options
D	Option b, c, & d

Id	**122**
Question	Following are the different membrane devices used commonly a) Flat sheet membranes b) Hollow fiber membranes c) Spiral wound d) Plate & frame e) Tubular
A	Option a & c only
B	Option b, c, d & e
C	Option a, c & d only
D	All the options

Id	**123**
Question	Choice of module configuration and arrangement of modules in the system depends on a) The type of separation problem b) Ease of cleaning & maintenance c) Ease of operations d) Compactness of the system e) Scale & possibility of membrane replacement
A	All options
B	None of the options
C	Option a, b & c
D	Option c, d & e

Id	**124**
Question	In plate & frame module system arrangement the spacer is used between two membranes
A	TRUE
B	FALSE
C	Not required
D	Depends on operation

Id	**125**
Question	In spiral wound membranes module central tube is known as
A	Feed flow tube
B	Concentrate flow tube
C	Permeate tube
D	Reject flow tube

Id	**126**
Question	The industrial biggest size of spiral wound membrane is
A	8” X 40”
B	4” X 40”
C	2.5' X 40”
D	40” X 40”

Id	**127**
Question	In spiral wound membrane module the feed spacer and permeate spacer both are used
A	FALSE
B	Only Feed spacer is used
C	Only permeate spacer is used
D	TRUE

Id	**128**
Question	Hollow fiber membrane modules are
A	Dead end filtration modules
B	Cross flow filtration modules
C	Can be used cross flow and dead end filtration modules
D	Only counter current flow system can be used

Id	**129**
Question	Capillary fiber modules can be operate in
A	Out to In operation mode
B	In to Out operation mode
C	Both In to Out and Out to In operations can be possible
D	Only dead end filtration mode is possible

Id	**130**
Question	For tubular membrane configuration
A	Packing density is high and Fouling resistance is high
B	Packing density is low and Fouling resistance is high
C	Packing density is low and Fouling resistance is low
D	Packing density is moderate and Fouling resistance is moderate

Id	**131**
Question	Fouling resistance is tolerance to suspended solids
A	TRUE
B	FALSE
C	Not necessary
D	Don't know

Id	**132**
Question	Packing density is
A	Number of membrane used
B	Number of membrane modules used
C	Membrane ares per unit volume of element
D	Volume of element per unit area of membrane

Id	**133**
Question	Ease of cleaning in hollow fiber membrane modules is
A	Poor
B	Fair
C	Good
D	Excellent

Id	**134**
Question	Packing density of membrane modules are having units
A	m^2 /m^3
B	m^3 / m^2
C	m^2 / bar
D	Bar / m^3

Id	**135**
Question	In plate and frame membrane modules replacement of membrane leaf is possible
A	Yes
B	No
C	Poor
D	Depends on the mode of operation

Id	**136**
Question	In hollow fiber membrane modules no of fibers / modules (thousands) depends on
A	Membrane area
B	Packing density
C	Fiber diameter
D	Length of fiber

Id	**137**
Question	In ultra-filtration fiber diameter is
A	1000 – 2000 µm
B	100 µm
C	250 – 500 µm
D	None of the above

Id	**138**
Question	How much of the module volume is generally filled with fiber?
A	80.00%
B	25.00%
C	5.00%
D	50.00%

Id	**139**
Question	Which membrane module is having very packing density
A	Hollow fiber
B	Capillary
C	Spiral wound
D	Plate & frame

Id	**140**
Question	Active membrane surface area is very high in
A	Plate and frame membrane modules
B	Tubular membrane modules
C	Spiral wound membrane modules
D	Hollow fiber membranes modules

Id	**141**
Question	Most efficient membranes modules for micro-filtration are
A	Hollow fiber membrane modules
B	Plate and frame modules
C	Tubular modules
D	None of the above

Id	**142**
Question	The hollow fiber membranes can cast up to thousand of meters
A	TRUE
B	FALSE
C	Can not casted
D	Difficult to cast only 1-5 meters is possible

Id	**143**
Question	In spiral wound modules permeate spacer is in between membrane toward active membrane surface
A	TRUE
B	FALSE
C	Both ways we can have the permeate spacer
D	Only out side of active membrane surface we can place permeate spacer

Id	**144**
Question	Active surface ares is always more in spiral wound modules than hollow fiber modules
A	TRUE
B	FALSE
C	Depends on type of application
D	Hollow fibers are more pinholes than flat sheet membranes

Id	**145**
Question	During manufacturing of spiral wound modules both sides are protected by one device known as
A	Telescoping device
B	Anti-telescoping device
C	Feed controller
D	Permeate controller

Id	**146**
Question	Plate and frame membrane modules configuration have
A	Low packing density
B	High packing density
C	Moderate packing density
D	Depends on number of plate and frames used

Id	**147**
Question	Tubular membrane have excellent ease of cleaning
A	Depends on operation
B	TRUE
C	FALSE
D	Can not be possible for cleaning

Id	**148**
Question	Relevant cost of tubular membrane modules is
A	Low
B	High
C	Moderate
D	Depends on application for which it is used

Id	**149**
Question	Main applications of hollow fiber membrane modules are
A	Reverse Osmosis, Gas permeation, Ultra-filtration
B	Micro filtration
C	Pervaporation
D	Gas permeation only

Id	**150**
Question	Packing density of low pressure gas separation membrane modules is
A	50 – 20 cm^2 /cm^3
B	5 – 10 cm^2 /cm^3
C	100 cm^2 /cm^3
D	> 100 cm^2 /cm^3