Id	**1**
Question	In most of the shell and tube heat exchangers, the tube pitch is generally _____the tube diameter.
A	Less than
B	1.25-1.50 times
C	2.5 times
D	One-fourth of

Id	**2**
Question	In a multipass shell and tube heat exchanger, tube side return pressure loss is equal to _____ the velocity head.
A	Twice
B	Four times
C	Square root of
D	Square of

Id	**3**
Question	Terminal point temperature differences between fluids in case of a heat exchanger is termed as-----
A	Approach
B	Log mean temperature difference
C	Arithmetic mean temperature difference
D	Geometric mean temperature difference

Id	**4**
Question	The main function of baffles provided in a shell and tube heat exchanger is to-----
A	Facilitate the cleaning of outer tube surface
B	Hold the tubes in position
C	Enhance turbulence
D	All of the above

Id	**5**
Question	In a shell and tube heat exchanger, the height of 25 percent cut baffles is equal to (where, D = inside diameter of shell)
A	0.75 D
B	0.25 D
C	0.50 D
D	None of these

Id	**6**
Question	Tube side pressure drop in a 1-2 heat exchanger (for turbulent flow of fluids through the tubes) is about _____ times, that in a 1-1 heat exchanger having the same size & number of tubes and operated at the same liquid flow rate.
A	2
B	1/2
C	4
D	8

Id	**7**
Question	In a shell and tube heat exchanger, the shortest centre to centre distance between the adjacent tubes is
A	Called tube pitch
B	Called tube clearance
C	Always less than the diameter of the tube
D	None of these

Id	**8**
Question	In a shell and tube heat exchanger having square pitch, the shell side equivalent diameter is given by--- (where, P = pitch, d = outside diameter of the tube)
A	$4(P^2 - \pi d^2/4)/\pi d$
B	$(P^2 - \pi d^2/4)/\pi d$
C	$4P^2/\pi d$
D	$\Pi d/4P^2$

Id	**9**
Question	Minimum tube pitch recommended for shell and tube heat exchangers is about _____ times the outside diameter of the tube.
A	1.75
B	2.5
C	1.25
D	3.5

Id	**10**
Question	In a shell and tube heat exchanger, the overall heat transfer co-efficient is proportional to the tube side (volumetric flow rate)$^{0.8}$. This is valid, only when the ratio of the tube side film resistance to the total resistance is almost equal to
A	∞
B	1
C	20.8
D	2

Id	**11**
Question	Triangular pitch tube layout as compared to square pitch in a shell and tube heat exchanger------
A	Permits the use of less tubes in a given shell diameter
B	Facilitates comparatively easier external cleaning because of large clearance
C	Permits the use of more tubes in a given shell diameter
D	Both B and C

Id	**12**
Question	In shell and tube heat exchangers, straight tie rods are used to
A	Hold baffle in space
B	Fix the tubes in position
C	Account for thermal strain
D	None of these

Id	**13**
Question	In case of a shell and tube heat exchanger, the minimum and maximum baffle spacing is respectively------- (where, D = inside diameter of the shell)
A	D/5 and D
B	D/2 and 2 D
C	D/4 and 2 D
D	D and 2 D

Id	**14**
Question	Baffle spacing is generally _____ the I.D. of the shell.
A	More than
B	Not greater than
C	Not less than one fifth of
D	Both B and C

Id	**15**
Question	In a shell and tube heat exchanger, tube side _____ of the mass velocity.
A	Heat transfer co-efficient is proportional to 0.8th power
B	Pressure drop is proportional to the square
C	Both A & B
D	Neither A nor B

Id	**16**
Question	In the design of a shell and tube heat exchanger, the corrosion allowance-------
A	Need not be provided for non-pressure parts like tie rods, spacers, baffles, supports etc
B	For carbon steel and cast iron pressure parts is 1.5 mm (except for tubes) and for severe conditions it is 3 mm
C	For internal cover and tube sheet is provided on both the sides
D	All of the above

Id	**17**
Question	When one of the fluids is highly corrosive and has fouling tendency, it should-----
A	Preferably flow inside the tube for its easier internal cleaning
B	Perferably flow outside the tube
C	Flow at a very slow velocity
D	Flow outside the tube, when the flow is counter-current and inside the tube when the flow is co-current

Id	**18**
Question	Baffles are provided in a shell and tube heat exchanger to increase the turbulence and velocity of the shell side fluid. Which of the following shaped baffles does not fall in the category of transverse baffle?
A	Segmental baffle
B	Flat plate extending across the wall
C	Disk type baffle
D	Helical type baffle

Id	**19**
Question	Baffles in the shell side of a shell and tube heat exchanger----
A	Increase the cross-section of the shell side liquid
B	Force the liquid to flow parallel to the bank
C	Increase the shell side heat transfer co-efficient
D	Decrease the shell side heat transfer co-efficient

Id	**20**
Question	If all the conditions and dimensions are same, then the ratio of velocity through the tubes of a double pass heat exchanger to that through the single pass heat exchanger is-----
A	1
B	2
C	1/2
D	4

Id	**21**
Question	In case of a multipass shell and tube heat exchanger, the temperature drop in the fluid---
A	Is inversely proportional to the resistance across which the drop occurs
B	And the wall are proportional to individual resistances
C	And the wall is not related
D	None of these

Id	**22**
Question	It is not recommended to use a 1-2 shell and tube heat exchanger for a particular heat duty, whenever the LMTD correction factor is----
A	> 0.75
B	< 0.75
C	< 0.50
D	< 0.25

Id	**23**
Question	In a shell and tube heat exchanger, putting a longitudinal baffle across the shell, forces the shell side fluid to pass _____ through the heat exchanger.
A	Once
B	Twice
C	Thrice
D	Four times

Id	**24**
Question	For large heat transfer area requirement, shell and tube heat exchanger is preferred, because it
A	Occupies smaller space
B	Is more economical
C	Is easy to operate and maintain
D	All of the above

Id	**25**
Question	In a shell and tube heat exchanger, the tube side heat transfer co-efficient just at the entrance of the tube is
A	Infinity
B	Zero
C	Same as average heat transfer co-efficient for tube side
D	None of these

Id	**26**
Question	Baffle spacing-----
A	Is not the same as baffle pitch
B	Should be less than one fifth the diameter of the shell
C	Should be less than the inside diameter of the shell
D	None of these

Id	**27**
Question	Which is the best tube arrangement (in a shell and tube heat exchanger) if the fluids are clean and non-fouling?
A	Square pitch
B	Triangular pitch
C	Diagonal square pitch
D	None of these

Id	**28**
Question	LMTD correction factor is used in heat exchanger design for
A	Double pipe heat exchanger
B	Multipass shell and tube heat exchanger
C	Fouling fluids
D	Counter flow of hot and cold fluids

Id	**29**
Question	In a heat exchanger, shell side fluid velocity can be changed by changing the tube------
A	Layout
B	Pitch
C	Both A & B
D	Neither A nor B

Id	**30**
Question	The advantage of using a 1 - 2 shell and tube heat exchanger over a 1 - 1 shell and tube heat exchanger is
A	Lower tube side pressure drop
B	Lower shell side pressure drop
C	Higher tube side heat transfer co-efficient
D	Higher shell side heat transfer co-efficient

Id	**31**
Question	In a shell and tube heat exchanger, square pitch compared to triangular pitch
A	Gives a higher shell side pressure drop
B	Gives a lower shell side pressure drop
C	Can pack more surface area into a shell of given diameter
D	None of these

Id	**32**
Question	High pressure fluid in a shell and tube heat exchanger should preferably be routed through the
A	Tubes to avoid the expansion of high pressure shell construction
B	Shell side for smaller total pressure drop
C	Shell side, if the flow is counter-current and tube side if the flow is co-current
D	Shell side for large overall heat transfer co-efficient

Id	**33**
Question	Which characteristic of a fluid is not important in deciding its route in a shell and tube heat exchanger?
A	Corrosiveness
B	Fouling characteristic
C	Viscosity
D	None of these

Id	**34**
Question	In a gas-liquid shell and tube heat exchanger, the-----
A	Presence of a non-condensible gas decreases the condensing film co-efficient
B	Gases under high pressure are routed through the tube side, because high pressure gases are corrosive in nature
C	Gases to be heated/cooled is normally routed through the shell side, because the corrosion caused by the cooling water or steam condensate remain localised to the tubes
D	All of the above

Id	**35**
Question	In a shell and tube heat exchanger, the shell side fluid velocity can not be changed by changing the
A	Tube layout
B	Tube diameter
C	Tube pitch
D	No. of baffles

Id	**36**
Question	If the baffle spacing in a shell and tube heat exchanger increases, then the Reynolds number of the shell side fluid
A	Remains unchanged
B	Increases
C	Increases or decreases depending on number of shell passes
D	Decreases

Id	**37**
Question	In a shell and tube type heat exchanger, the floating tube bundle heat arrangement is used
A	In low range of temperature differences
B	In high range of temperature differences
C	Because of its low cost
D	To prevent corrosion of the tube bundles

Id	**38**
Question	Vibrations in the tubes of a shell and tube heat exchanger is induced due to the
A	Flow of fluid on the tube and shell sides
B	Oscillations in the flow of shell/tube sides fluid
C	Vibrations transmitted through piping and/or supports due to external reasons
D	All of the above

Id	**39**
Question	For given number of passes, pitch & tube diameter, the maximum number of tubes that can be accommodated in a shell of tripled inside diameter will be _____ times.
A	About 9
B	Considerably more than 9
C	Considerably less than 9
D	About 3

Id	**40**
Question	The thickness of segmental baffles (25 -35% cut truncated plates usually) is generally _____ the tube wall thickness.
A	Equal to
B	Twice
C	Four times
D	Half

Id	**41**
Question	Convective heat transfer, in which heat is transferred by movement of warmed matter is described by
A	Fourier's law
B	Newton's law of cooling
C	Fick's law
D	None of these

Id	**42**
Question	The compact heat exchangers are commonly used in
A	gas to gas heat transfer
B	gas to liquid heat transfer
C	both A and B
D	none of the above

Id	**43**
Question	The scales form in heat exchangers after a period of operation and provide additional resistance to heat transfer with some heat transfer coefficient. The reciprocal of this scale heat transfer coefficient is called as
A	scaling factor
B	fouling factor
C	forming factor
D	resisting factor

Id	**44**
Question	When is the arithmetic mean temperature difference of heat exchanger used instead of LMTD?
A	when the temperature profiles of two fluids of heat exchanger are sloping downward with curve
B	when the temperature profiles of two fluids of heat exchanger are sloping upward with curve
C	when the temperature profiles of two fluids of heat exchanger are straight
D	none of the above

Id	**45**
Question	Which of the following temperature difference is safer than other to consider in designing of heat exchangers?
A	Arithmetic Mean Temperature Difference (ΔT_{am})
B	Logarithmic Mean Temperature Difference (LMTD)
C	Both have nothing to do with safety
D	Other

Id	**46**
Question	For the same inlet and exit temperatures of two fluids, the LMTD for counterflow is always
A	smaller than LMTD for parallel flow
B	greater than LMTD for parallel flow
C	same as LMTD for parallel flow
D	unpredictable

Id	**47**
Question	For the same heat transfer Q and same overall heat transfer coefficient U_o, surface area required for parallel flow operation is always
A	less than LMTD for counter flow
B	more than LMTD for counter flow
C	same as LMTD for counter flow
D	unpredictable

Id	**48**
Question	In parallel flow heat exchangers,
A	the exit temperature of hot fluid is always equal to the exit temperature of cold fluid
B	the exit temperature of hot fluid is always less than the exit temperature of cold fluid
C	the exit temperature of hot fluid is always more than the exit temperature of cold fluid
D	we cannot predict comparison between exit temperatures of hot fluid and cold fluid

Id	**49**
Question	For the same heat transfer Q and same overall heat transfer coefficient U_o, surface area required for cross flow operation is always
A	less than LMTD for parallel flow
B	more than LMTD for parallel flow
C	same as LMTD for parallel flow
D	unpredictable

Id	**50**
Question	How many times do we have to calculate for Pressure drop in a Shell and Tube Heat Exchanger?
A	1
B	2
C	3
D	4

Id	**51**
Question	In an operation where we want to heat a stream of liquid by Steam, we have the option to use extended fins. Then which of the following is best suited?
A	Steam on the shell side with the fins on outer surface of the tube
B	Steam on the tube side with the fins on outer surface of the tube
C	Steam on the shell side with the fins on inner surface of the tube
D	Steam on the tube side with the fins on inner surface of the tube

Id	**52**
Question	When a fluid is used in a Shell and Tube heat exchanger, which one of the following is not true?
A	If the fluid is gas then the gas side heat transfer coefficient is the lowest
B	Extended fins are used on the shell side to increase the Heat Transfer coefficient
C	Baffles are provided only to work as fins
D	Fins increase necessary heat transfer area

Id	**53**
Question	The three most common types of shell-and-tube exchangers are: (1) fixed tubesheet design. (2) U-tube design. (3) floating-head type. (4) Regenerator Type.
A	(1),(3),(4)
B	(2),(3),(4)
C	(1),(2),(3)
D	(1),(2),(4)

Id	**54**
Question	Which of the following has the maximum Log mean temperature difference for a Shell and tube Heat Exchanger?
A	Counter-flow
B	Parallel Flow
C	Cross Flow
D	Split Flow

Id	**55**
Question	What are the types of baffles exist for a shell and tube heat exchanger?
A	Cross baffle, Split baffle and segmental baffle
B	Counter baffle, doughnut baffle and Cross baffle
C	Orifice baffle, segmental baffle and doughnut baffle
D	Orifice baffle, segmental baffle and doughnut baffle

Id	**56**
Question	Which one of the following fluid cannot be placed in the shell side?
A	Condensing Vapour
B	Fluid with very high temperature
C	Fluid with very high pressure
D	Fluid with high viscosity

Id	**57**
Question	Which one of the following fluid cannot be placed in the tube side?
A	Fouling Fluid
B	Cooling liquid
C	Corrosive fluid
D	Highly viscous

Id	**58**
Question	What are the ways can tubes be arranged in a shell and tube Heat Exchanger?
A	Half parallel flow arrangement & Semi parallel flow arrangement
B	Hairpin arrangement & Full parallel flow arrangement
C	Full parallel flow arrangement & Half parallel flow arrangement
D	Hairpin arrangement & Half parallel flow arrangement

Id	**59**
Question	Shell and tube HE as well as baffle designs are made by strictly following the standards of_____
A	TERA
B	AESA
C	TEMA
D	AISA

Id	**60**
Question	What is the equivalent diameter of a triangular pitch shell and tube Heat Exchanger if pitch is 40mm, the outer diameter of the tubes is 30mm?
A	29.4 mm
B	28.4 mm
C	26.2 mm
D	24.1 mm

Id	**61**
Question	_____ heat exchanger is also known as 'hair pin type' exchanger.
A	Double pipe
B	Finned
C	Plate type
D	Regenerative

Id	**62**
Question	Double pipe heat exchangers are used----
A	When heat transfer area required is very high
B	When heat transfer area required is very low, i.e (100-200 ft^2)
C	Because it occupies less floor area
D	Because it is less costly

Id	**63**
Question	Tube pitch is the _____ of tube diameters and the clearances.
A	Sum
B	Difference
C	Ratio
D	None of these

Id	**64**
Question	Log mean temperature difference in case of multi-pass shell and tube heat exchanger is always----
A	Less than arithmetic mean value
B	More than arithmetic mean value
C	More than geometric mean value
D	Both B & C

Id	**65**
Question	Tube expansion allowances exist in _____ heat exchanger.
A	Multipass fixed tube sheet
B	Single pass fixed tube sheet
C	U-tube
D	None of these

Id	**66**
Question	The equivalent diameter for pressure drop is _____ that for heat transfer.
A	Smaller than
B	Greater than
C	Equal to
D	Not related with

Id	**67**
Question	In case of 1.5" heat exchanger tubes, the inside flow area _____ with decrease in BWG.
A	Increases
B	Decreases
C	Remains same
D	None of these

Id	**68**
Question	Pick out the wrong statement.
A	Orifice baffles are never used in a shell and tube heat exchanger.
B	Pressure drop on the shell side of a heat exchanger depends upon tube pitch also.
C	Split ring type and pull through type floating heads are two commonly used floating heads is heat exchangers.
D	Fouling factor provide a safety factor for design

Id	**69**
Question	Convective heat transfer co-efficient in case of fluid flowing in tubes is not affected by the tube length/diameter ratio, if the flow is in the _____ zone.
A	Laminar
B	transition
C	both 'a' & 'b'
D	highly turbulent

Id	**70**
Question	The unit of heat transfer co-efficient in SI unit is
A	$J/S^{2}°K$
B	$W/m^{2}°K$
C	W/m°K
D	J/m°K

Id	**71**
Question	Controlling heat transfer film co-efficient is the one, which offers _____ resistance to heat transfer.
A	No
B	the least
C	the largest
D	lower

Id	**72**
Question	_____ heat exchanger is the most suitable, when the temperature of shell side fluid is much higher than that of tube side.
A	Single pass, fixed tube sheet
B	U-tube
C	Three pass, fixed tube sheet
D	none of these

Id	**73**
Question	The equivalent diameter for the annulus of a double pipe heat exchanger, whose inner pipe has fins on the outside is _____ compared to the same size pipes without fins.
A	More
B	Less
C	Same
D	Unpredictable

Id	**74**
Question	In a co-current double pipe heat exchanger used for condensing saturated steam over the inner tube, if the entrance and exit conditions of the coolant are interchanged, then the rate of condensation will----
A	Increase
B	Decrease
C	Remain unchanged
D	Either increase or decrease; depends on the coolant flow rate

Id	**75**
Question	A concentric double pipe heat exchanger as compared to the shell and tube heat exchanger for the same heat load requires-----
A	Less heating surface
B	More space
C	Lower maintenance cost
D	None of these

Id	**76**
Question	Air is best heated with steam in a heat exchanger of…
A	plate type
B	double pipe type with fin on steam side
C	double pipe type with fin on air side
D	shell and tube type.

Id	**77**
Question	In a double pipe heat exchanger, the inner pipe is supported within the outer pipe by….
A	Using rods
B	Spacer
C	Packing glands
D	None of these

Id	**78**
Question	When hairpins are employed in excess of 20ft in length of double pipe…
A	The inner pipe tends to sag
B	It causes poor flow distribution in annulus
C	Both A & B
D	None of these

Id	**79**
Question	The principal disadvantage to the use of double pipe heat exchangers lies in ……..
A	The small amount of heat transfer surface contained in a single hairpin
B	Higher maintenance cost
C	Its capacity to handle variety of fluids
D	None of these

Id	**80**
Question	Sieder & Tate equation is applicable for-----
A	Organic liquids
B	Aqueous solutions and gases
C	Both A & B
D	None of A & B

Id	**81**
Question	When steam is used on the tube side of the Heat Exchanger, then the allowable pressure drop should be less than _____ P.S.I.
A	1
B	2
C	3
D	4

Id	**82**
Question	Our design dirt factor should be _____ the provided threshold dirt factor.
A	Less than
B	More than
C	Equal to
D	Much less than

Id	**83**
Question	We have a fluid of dirt factor 0.0035 which we want to use in our operation. Then during design considerations, we find that for our design the dirt factor is not applicable, this value of the dirt factor can be _____
A	0.00035
B	0.0035
C	0.0045
D	0.0055

Id	**84**
Question	Which one of the following cannot be determined by knowing fouling factors?
A	When to clean the equipment
B	When the equipment will stop to work
C	Its value is zero for a new heat exchanger
D	Its value is infinity for an old heat exchanger

Id	**85**
Question	The phenomenon of scaling on the surface of a Heat Exchanger due to the hardness of water where salts get deposited on the surface is an example of ____ fouling.
A	Chemical
B	Deposition
C	Biology
D	Corrosion

Id	**86**
Question	Which of the following statements are not true about fouling in a Heat Exchanger?
A	It decreases the heat transfer coefficient in both sides
B	Temperature of the hot fluid remains hot and the cold fluid remains cold
C	Pressure drop decreases
D	Efficiency decreases

Id	**87**
Question	If we know the output and input temperatures of the heat exchanging fluids, then which one of the following calculation is not required to determine the number of bends in tube for the equipment?
A	Pressure drop in the equipment
B	Overall heat transfer coefficients
C	Total heat transfer area required
D	Pipe length

Id	**88**
Question	Which of the following has the maximum Log mean temperature difference for a Double Pipe Heat Exchanger?
A	Counter-flow
B	Parallel Flow
C	Cross Flow
D	Split Flow

Id	**89**
Question	Which one of the following is the determining reason for heat transfer in double pipe Heat Exchanger?
A	Conduction
B	Natural Convection
C	Forced Convection
D	Radiation

Id	**90**
Question	Which one of these is not true when the steady state is reached by the heat exchanging fluids in a double pipe Heat Exchanger?
A	When the two liquids have same temperature
B	When their temperatures become stable
C	Wall temperature becomes constant
D	Rate of heat transfer becomes constant

Id	**91**
Question	We can apply LMTD only when? (i) There is no change in Specific heats (ii) Overall heat transfer coefficient is constant (iii) No heat loss (iv) No pressure drop
A	(ii)(iii)(iv)
B	(i)(ii)(iii)
C	(ii)(iii)
D	(i)(ii)(iv)

Id	**92**
Question	Which one of the following is true about a hairpin used in double pipe Heat Exchanger?
A	It can handle high pressure drops
B	It cannot handle high pressure drops
C	It is very resistant to fouling
D	It is very expensive

Id	**93**
Question	Which of the following phases of designing of heat exchangers does designer consider corrosive nature of the fluid in?
A	The thermal analysis
B	The mechanical design
C	The design for manufacture
D	none of the above

Id	**94**
Question	1. How is the logarithmic mean temperature difference (LMTD) calculated for heat exchangers? Where, ΔT_i= temperature difference between hot and cold fluid at inlet of heat exchanger ΔT_e = temperature difference between hot and cold fluid at exit of heat exchanger
A	$\ln (\Delta T_i - \Delta T_e)$
B	$\ln (\Delta T_e - \Delta T_i)$
C	$(\Delta T_i - \Delta T_e) / (\ln (\Delta T_e / \Delta t_i))$
D	$(\Delta T_i - \Delta T_e) / (\ln (\Delta T_i / \Delta t_e))$

Id	**95**
Question	In case of parallel flow heat exchanger, the lowest temperature theoretically attainable by the hot fluid is _____ the outlet temperature of the cold fluid.
A	Equal to
B	More than
C	Less than
D	Either more or less than (depending upon the fluid)

Id	**96**
Question	In a heat exchanger, the rate of heat transfer from the hot fluid to the cold fluid
A	Varies directly as the area and the LMTD
B	Directly proportional to LMTD and inversely proportional to the area
C	Varies as square of the area
D	None of these

Id	**97**
Question	A multiple effect evaporator as compared to a single effect evaporator of the same capacity has
A	Lower heat transfer area
B	Lower steam economy
C	Higher steam economy
D	Higher solute concentration in the product

Id	**98**
Question	_____ heat exchanger is used for chilling oil to be dewaxed.
A	U-tube
B	Double pipe
C	Fixed tube
D	Floating head

Id	**99**
Question	Double pipe heat exchangers are preferably useful, when
A	High viscosity liquid is to be cooled
B	Requirement of heat transfer area is low
C	Overall heat transfer co-efficient is very high
D	A corrosive liquid is to be heated

Id	**100**
Question	An equipment which converts the latent or sensible heat of one fluid into the latent heat of vaporisation of another, is called a
A	boiler
B	heat exchanger
C	recuperator
D	regenerator

Id	**101**
Question	'Fouling factor' used in the design of a multipass shell and tube heat exchanger is a
A	non-dimensional factor.
B	factor of safety.
C	conversion factor for individual film heat transfer co-efficient to overall heat transfer co-efficient.
D	none of these

Id	**102**
Question	For specified tube outside diameter, higher BWG means higher
A	tube thickness
B	cross-sectional area
C	weight per unit length
D	none of these

Id	**103**
Question	Which type of heat exchanger is preferred for heavy heat loads ?
A	Double pipe
B	Plate fine
C	Series and parallel set of shell and tube
D	None of these

Id	**104**
Question	Extremely large or small volumes of fluids are generally best routed through the shell side of a shell and tube heat exchanger, because of the
A	less corrosion problems
B	flexibility possible in the baffle arrangement
C	low pressure drop
D	high heat transfer co-efficient

Id	**105**
Question	In a heat exchanger, the rate of heat transfer from the hot fluid to the cold fluid
A	varies directly as the area and the LMTD.
B	directly proportional to LMTD and inversely proportional to the area
C	varies as square of the area
D	none of these

Id	**106**
Question	Which is the best tube arrangement (in a shell and tube heat exchanger) if the fluids are clean and non-fouling ?
A	Square pitch
B	Triangular pitch
C	Diagonal square pitch
D	None of these

Id	**107**
Question	The purpose of providing expansion bellows in the shell of tubular exchanger is to
A	increase the heating load.
B	impart structural strength.
C	account for the uneven expansion of shell and tube bundles.
D	facilitate increase of shell length, if needed.

Id	**108**
Question	Based upon the nature of heat exchange process, the heat exchangers are classified into how many categories
A	1
B	2
C	3
D	4

Id	**109**
Question	In how many categories heat exchangers are classified on the basis of mechanical design of heat exchanger surface?
A	2
B	4
C	1
D	3

Id	**110**
Question	In how many categories heat exchangers are classified on the basis of physical state of heat exchanging fluids?
A	1
B	2
C	3
D	4

Id	**111**
Question	Many types of heat exchangers have been developed to meet the widely varying applications. Based upon their (i) Operating principle (ii) Arrangement of flow path (iii) Design Identify the correct statements
A	i, ii and iii
B	i and ii
C	ii and iii
D	i and iii

Id	112
Question	Assumptions made for calculation of logarithmic mean temperature difference are (i) Constant overall heat transfer coefficient (ii) The kinetic and potential energy changes are negligible (iii) There is no conduction of heat along the tubes of heat exchanger Identify the correct statements
A	i, ii and iii
B	i and iii
C	i and ii
D	ii and iii

Id	**113**
Question	Which one of the following does not belong to the classes of multipass heat exchangers?
A	Compound flow extended surface
B	Regenerative
C	Split flow shell and tube
D	Parallel counter-flow shell and tube

Id	**114**
Question	Which of the following is not a subset of Multipass Extended Surface Heat Exchangers?
A	Cross Counter Flow
B	Cross Parallel Flow
C	Split Flow
D	Compound Flow

Id	**115**
Question	Which one of the following statement is correct?
A	Split flow has one input flow and two output flow
B	Divided flow has two output flow and one input flow
C	Double split flow has two input flow and one output
D	Cross flow has two input and two output flows

Id	**116**
Question	How many times do we have to calculate for Nusselt number in a Double Pipe Heat Exchanger?
A	1
B	2
C	3
D	4

Id	**117**
Question	Which of the following is not a subset of the category of Tubular Heat Exchangers?
A	Double pipe
B	Finned pipe
C	Shell and Tube
D	Spiral tube

Id	**118**
Question	In an operation where we want to heat a stream of liquid by Steam, we have the option to use extended fins. Then which of the following is best suited?
A	Steam on the annular side with the fins on the cold liquid side
B	Steam on the annular side with the fins on the steam side
C	Steam on the inner side with the fins on the cold liquid side
D	Steam on the inner side with the fins on the steam side

Id	**119**
Question	In a double pipe heat exchanger, in the inner side fluid enters at 20°C and leaves at 45°C. The annulus has steam condensing at 1atm. What is the value of LMTD?
A	39°C
B	66.7°C
C	70°C
D	40.5°C

Id	**120**
Question	Which of the following is not a classification based on Construction of the heat Exchanger?
A	Tubular
B	Plate Type
C	Multipass
D	Regenerative

Id	**121**
Question	Floating head heat exchangers are used for the
A	Heat transfer between corrosive fluids
B	Cases where temperature difference between the shell and the tubes is more (>50°C)
C	Co-current heat transfer systems
D	Counter-current heat transfer systems

Id	**122**
Question	Overall heat transfer co-efficient of a particular tube is U_1 . If the same tube with some dirt deposited on either side has coefficient U_2 , then
A	$U_1 = U_2$
B	$U_2 > U_1$
C	$U_1 > U_2$
D	U_1 = dirt factor - U_2

Id	**123**
Question	Temperature profile in steady state heat transfer is
A	Asymptotic
B	Hyperbolic
C	Parabolic
D	Linear

Id	**124**
Question	In a 1-1 cocurrent heat exchanger, if the tube side fluid outlet temperature is equal to the shell side fluid outlet temperature, then the LMTD is
A	∞
B	0
C	Equal to the difference between hot and cold fluids inlet temperature
D	Equal to the difference between hot fluid inlet temperature and cold fluid outlet temperature

Id	**125**
Question	In a heat exchanger, floating head is provided to
A	Facilitate cleaning of the exchanger
B	Increase the heat transfer area
C	Relieve stresses caused by thermal expansion
D	Increase log mean temperature gradient

Id	**126**
Question	Heat transfer rate described by Fourier's law will decrease, if the _____ increases.
A	Thermal conductivity
B	Thickness
C	Temperature difference
D	Heat transfer area

Id	**127**
Question	A 2-4 heat exchanger involves
A	Only counter-flow of fluids
B	Only parallel-flow of fluids
C	Both counter and parallel-flow of the fluids
D	Smaller pressure drop compared to 1-2 exchanger

Id	**128**
Question	Log mean temperature difference (LMTD) cannot be used, if
A	Heat transfer co-efficient over the entire heat exchanger is not constant
B	There exists an unsteady state
C	The heat capacity is not constant and there is a phase change
D	None of these

Id	**129**
Question	Fouling factor-------
A	Is a dimensionless quantity
B	Does not provide a safety factor for design
C	Accounts for additional resistances to heat flow
D	None of these

Id	**130**
Question	LMTD for counterflow and prallel flow heat exchanger will be the same, when the
A	Cold fluid is heated to a certain temperature by condensing steam (isothermal fluid)
B	Outlent temperature of both the hot and cold fluid are same
C	Outlet temperature of hot fluid is less than the outlet temperature of the cold fluid
D	None of these

Id	**131**
Question	_____ of water makes it a widely used coolant in heat exchangers.
A	Low corrosiveness
B	Low dirt factor
C	High specific heat
D	Low viscosity

Id	**132**
Question	Heat exchanger tubes are never made of
A	Plain carbon steel
B	Stainless steel
C	Lead
D	Copper

Id	**133**
Question	Multipass heat exchangers are used-------
A	Because of simplicity of fabrication
B	For low heat load
C	To obtain higher heat transfer co-efficient and shorter tube
D	To reduce the pressure drop

Id	**134**
Question	In a liquid-liquid heat exchanger, for the same process temperature, the ratio of the LMTD in parallel flow to the LMTD in counter flow is always---------
A	< 1
B	> 1
C	1
D	∞

Id	**135**
Question	In counter flow compared to parallel flow,--------
A	LMTD is greater
B	Less surface area is required for a given heat transfer rate
C	Both A and B
D	More surface area is required for a given heat transfer rate

Id	**136**
Question	Indirect contact heat exchangers are preferred over direct contact heat exchangers, because
A	Heat transfer co-efficient are high
B	There is no risk of contamination
C	There is no mist formation
D	Cost of equipment is lower

Id	**137**
Question	Heat transfer efficiency leading of energy conservation in a heat exchanger can be achieved by
A	Keeping the heat transfer surface clean
B	Enhancing the fluid pumping rate
C	Increasing the tube length
D	None of these

Id	**138**
Question	Dietus-Boelter equation used for the determination of heat transfer co-efficient is valid
A	For fluids in laminar flow
B	For fluids in turbulent flow
C	When Grashhoff number is very important
D	For liquid metals

Id	**139**
Question	The outlet temperature of cooling water in a heat exchanger is generally not allowed to exceed above 50°C in industrial practice mainly to avoid
A	Its evaporation loss
B	Excessive corrosion
C	Uneconomic LMTD
D	Decrease in heat exchanger efficiency

Id	**140**
Question	LMTD can't be used as such without a correction factor for the------
A	Multipass heat exchanger
B	Baffled heat exchanger
C	Condensation of mixed vapour in a condenser
D	All of the above

Id	**141**
Question	h.D/K is called the _____ number.
A	Nusselt
B	Peclet
C	Rayleigh
D	Grashoff

Id	**142**
Question	(N_{Gr} x N_{Pr}) is called the _____ number.
A	Rayleigh
B	Grashoff
C	Stanton
D	Nusselt

Id	**143**
Question	If h_1 = inner film co-efficient and /h_2 = outer film co-efficient, then the overall heat transfer co-efficient is
A	Always less than h_1
B	Always between h_1 and h_2
C	Always higher than h_2
D	Dependent on metal resistance

Id	**144**
Question	The unit of heat transfer co-efficient is
A	BTU/hr. $ft^2°F$
B	BTU/hr. °F. ft
C	BTU/hr. °F
D	BTU/hr. ft

Id	**145**
Question	Heat transfer co-efficient equation for forced convection, Nu = 0.023 $R_e^{0.8}$. P_r^n, is not valid, if the value of
A	N = 0.4 is used for heating
B	N = 0.3 is used for cooling
C	Reynolds number for the flow involved is > 10000
D	Reynolds number for the flow involved is < 2100

Id	**146**
Question	What is the thermal conductivity of a perfect heat insulator?
A	Zero
B	One
C	∞
D	Between 0 and ∞

Id	**147**
Question	Which of the following is correct?
A	Rate = Driving force x Resistance
B	Driving force = Rate x Resistance
C	Resistance = Driving force x Rate
D	Rate = Resistance/Driving force

Id	**148**
Question	The maximum heat transfer co-efficient from steam heating will be attained when the steam is
A	Supersaturated
B	Saturated
C	Wet
D	None of these

Id	**149**
Question	The ratio of kinematic viscosity to thermal diffusivity is called the _____ number.
A	Peclet
B	Prandtl
C	Stanton
D	Nusselt

Id	**150**
Question	With increase in temperature, the thermal conductivity of a gas
A	Increases
B	Decreases
C	Remains same
D	May increase or decrease depending on the type of gas