

University of Mumbai
Online Examination 2020
 Program: BEChemical Engineering
 Curriculum Scheme: Revised 2012
 Examination: Fourth Year Semester VII
 Course Code: CHC 702
 Course Name: Process Engineering

Time: 1 Hour

Max. Marks: 50

Note to the Students: All Questions are compulsory and carry equal marks.

Q.1.	In which activity of process engineer, deciding of type of valves is considered?
Option A:	Knowledge about statutory requirements
Option B:	Deciding the requirement of interlock, shutdown arrangement
Option C:	Deciding piping requirements
Option D:	Establishing design basis
Q.2.	Pollution control board norms will not guide about _____
Option A:	Safety limit for COD and BOD of waste water
Option B:	Safety limits of gaseous emissions
Option C:	Safety limits for exhaust of stack gases
Option D:	Safety limit for rate of reaction
Q.3.	Among the following options, generally which is not the part of process and instrumentation diagram?
Option A:	Temperature controller
Option B:	Density controller
Option C:	Pressure controller
Option D:	Level controller
Q.4.	Which of the following statements is NOT CORRECT?
Option A:	We should recover more than 99 percentage of a valuable materials
Option B:	Utilities such as air, water, etc. are less valuable than organic one so do not bother to recover and recycle it
Option C:	The greater amount of excess we use, more complete conversation of the reactant we obtain
Option D:	In combustion reaction use an excess amount of fuel to ensure complete conversion of the fuel
Q.5.	From the options below, identify which is Level 2 decision in flow sheet synthesis.
Option A:	Recycle structure of flow sheet
Option B:	Batch v/s Continuous process
Option C:	Input-Output structure of the flow sheet
Option D:	Separation system synthesis
Q.6.	As per thumb rules, in which of the following case, batch process is not suitable?
Option A:	Production rate is more than one lakh tonnes per annum

Option B:	Plant is producing seasonal product
Option C:	Reactions occurring in a process are very slow
Option D:	Process involves the material which tend to foul the equipment and hence frequent cleaning is required
Q.7.	From the options below, which can not be the choice for vapor recovery system?
Option A:	Absorption
Option B:	Adsorption
Option C:	Membrane separation
Option D:	Decantation
Q.8.	In chemical reactions, fraction converted per pass is defined on the basis of _____
Option A:	Excess reactant
Option B:	Limiting reactant
Option C:	Product
Option D:	By-product
Q.9.	Feed mixture to flash column consists of components A, B and C in which component A is the key component. Overhead recovery of key component is 0.7. Vapor pressures of component A and C are 900 and 450 mm Hg respectively. Then calculate bottom recovery of component C.
Option A:	0.539
Option B:	0.291
Option C:	0.461
Option D:	0.876
Q.10.	In distillation of feed mixture of benzene, toluene and o-xylene, light and heavy key components are benzene and o-xylene respectively. Relative volatility of toluene to o-xylene is 2.7 and 10% of o-xylene in feed goes to distillate. If minimum number of stages required in this distillation column are 3, then calculate percentage recovery of toluene in distillate.
Option A:	60%
Option B:	56.4%
Option C:	87.9%
Option D:	68.6%
Q.11.	Absorption factor for air in solvent is _____
Option A:	1
Option B:	Infinity
Option C:	1.4
Option D:	0
Q.12.	As a safety factor one should choose the vessel pressure to be ---- percent higher than the actual pressure of process calculated from mass and energy balance.
Option A:	10
Option B:	20
Option C:	50
Option D:	90
Q.13.	Isothermal compression _____
Option A:	Doesn't require removal of heat to keep the system at initial temperature

Option B:	Are characterized by temperature changes at large
Option C:	Requires constant work
Option D:	Requires constant removal of heat to keep the system at initial temperature
Q.14.	During cost estimation of equipment, according to Guthrie, $BMC = BC \times MF$
Option A:	BMC is base material cost
Option B:	BMC is base module cost
Option C:	BMC is bare module cost
Option D:	BMC is bare material cost
Q.15.	According to Guthrie's cost estimation formulae, MPF is _____
Option A:	Module pressure factor
Option B:	Material and pressure factor
Option C:	Modular pressure function
Option D:	Material pressure function
Q.16.	For a compressor, value of design factor (F_d) is 1.15, then calculate material and pressure factor (MPF) for this compressor.
Option A:	1.15
Option B:	0.575
Option C:	1.32
Option D:	2.30
Q.17.	Which method of risk assessment provides information about how failure can occur and probability of occurrence?
Option A:	Fault tree analysis
Option B:	Quantitative risk analysis
Option C:	Layer of protection analysis
Option D:	Event tree analysis
Q.18.	Three major types of accidents related to chemical industries do not include
Option A:	Fire
Option B:	Explosion
Option C:	Mechanical accident
Option D:	Toxic release
Q.19.	In Process control, the variables, which are controlled by external environment i.e. their values are not the result of adjustment by an operator or control system, are called as _____
Option A:	Controlled variables
Option B:	Disturbances
Option C:	Manipulated variables
Option D:	Input variables
Q.20.	Among the options below, which is NOT the thumb rule followed while designing control loop for given process system?
Option A:	Number of controllers in control configuration should be equal to number of degrees of freedom of the system
Option B:	Number of output variables should be more than number of input variables

Option C:	There should not be more than one controller on same process line
Option D:	The control configuration is said to be underdefined when number of controllers in given control loop are less than number of degrees of freedom
Q.21.	In Liquid phase catalytic reduction process, which gas is used as reducing agent?
Option A:	H ₂
Option B:	Cl ₂
Option C:	N ₂
Option D:	O ₂
Q.22.	Which special type of reactor is used in chlorination process?
Option A:	Fluidized bed reactor
Option B:	Falling film reactor
Option C:	Bubble column reactor
Option D:	Mechanically agitated reactor
Q.23.	In exothermic reactions occurring in reactor, to remove heat of reaction, one has to circulate _____ through jacket around the reactor
Option A:	Steam
Option B:	Compressed air
Option C:	Nitrogen
Option D:	Chilled water
Q.24.	Compressed air is used as utility in chemical process industries for _____
Option A:	Heating
Option B:	Cooling
Option C:	Cleaning, flushing, etc.
Option D:	Creating inert atmosphere in process
Q.25.	There is a hot process stream, which is to be cooled from 300 to 180 °C by exchanging its heat with cold stream which is to be heated from 50 to 150 °C. The heat capacity flow rates of hot and cold stream are 5 and 7 kW/°C respectively. Then in order to achieve their (hot and cold stream) respective target temperatures, how much extra heating or cooling utility is required?
Option A:	Heating utility of 700 kW is required
Option B:	Heating utility of 100 kW is required
Option C:	Cooling utility of 600 kW is required
Option D:	Cooling utility of 100 kW is required

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Question	Correct Option
Q.1	C
Q.2	D
Q.3	B
Q.4	D
Q.5	C
Q.6	A
Q.7	D
Q.8	B
Q.9	C
Q.10	D
Q.11	D
Q.12	C
Q.13	D
Q.14	C
Q.15	B
Q.16	A
Q.17	D
Q.18	C
Q.19	B
Q.20	B
Q.21	A
Q.22	C
Q.23	D
Q.24	C
Q.25	B