Reg. No.															

Question Paper Code	13301

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Fifth Semester

Instrumentation and Control Engineering

20ICEL503 - UNIT OPERATIONS AND CONTROL

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Segregation is due to differences in the_____ of the components of the mix (a) size (b) temperature (c) pressure (d) color	1	K1	CO1
2.	Important non conducting materials are (a) Hematite (b) Jamesonite (c) Linnaeite (d) Quartz	1	K1	CO1
3.	The volume of any particle is proportional to its (a) diameter cube (b) diameter (c) diameter square (d) square root of diameter	1	K1	CO1
4.	In test sieve Area of opening in any screen is equal to _____ Area of opening in next smaller screen. (a) 4 times (b) three times (c) two times (d) none of the above	1	K1	CO1
5.	The major principles governing solute and fluid transport across the peritoneal membrane are _____ (a) Dryer (b) Diffusion (c) Convention (d) Radiation	1	K1	CO2
6.	When two liquids combine to form a new liquid, we call the liquids (a) Miscible (b) Immiscible (c) Solid (d) Gascible	1	K1	CO2
7.	Where does sedimentation separation value is used? (a) Bread (b) Chocolate (c) Salt (d) Sugar	1	K1	CO2
8.	_____ states that in steady state ideal flow of an incompressible fluid, the total energy per unit mass, which consists of pressure energy, kinetic energy and datum energy at any point of the fluid is constant. (a) superposition's theorem (b) Boyle's theorem (c) Bernoulli’s theorem (d) Maxwell’s theorem	1	K1	CO2
9.	_____ is the temperature at which the saturated vapor starts to condense. (a) bubble point (b) Dew point (c) boiling point (d) triple point	1	K1	CO3
10.	In steam distillation, as long as water is present, the high- boiling component B vaporizes at a temperature well _____ (a) Below its normal boiling point with using a vacuum. (b) Above its normal boiling point without using a vacuum. (c) Below its normal boiling point without using a vacuum. (d) Above its normal boiling point with using a vacuum.	1	K1	CO3
11.	Heat transfer coefficient is about _____ for drop wise condensation than film wise condensation (a) 4 to 8 times higher (b) 4 to 8 times lower (c) 2 times lower (d) 2 times higher	1	K1	CO3
12.	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	1	K1	CO3
13.	The choice of method for achieving super saturation depends on the effect (a) atmospheric pressure (b) of pressure on solubility (c) of temperature on solubility (d) vacuum	1	K1	CO4

14.	The most common continuous dryer used in chemical and food industry are (a) fluidized dryer (b) drum dryer (c) kiln dryer (d) tray dryer	*1*	*K1*	*CO4*
15.	A paper-making machine is designed based on (a) porous material (b) twin drum machine (c) viscous material (d) for hard materials	*1*	*K1*	*CO4*
16.	For many materials, the rate of thermal degradation follows an Arrhenius relationship, and the maximum permissible working temperature _____ (a) Raises exponentially with an increase in holding time. (b) Falls exponentially with an increase in holding time. (c) Falls exponentially with a decrease in holding time. (d) Raises exponentially with a decrease in holding time.	*1*	*K1*	*CO4*
17.	Which one is false about SOE (a) SOE is a Stand Alone System. (b) Scanning Time is 1 second. (c) Determines First Cause Of Trip. (d) Automatic Triggered when any point in alarm.	*1*	*K1*	*CO5*
18.	_____is used Refractory brick linings (a) Limestone (b) Dolomite (c) Magnesite (d) Fluorspar	*1*	*K1*	*CO5*
19.	Chrome tanning and vegetable tanning are done for (a) light and heavy leather respectively (b) heavy and light leather respectively (c) Both light and heavy leather (d) neither light and heavy leather	*1*	*K1*	*CO5*
20.	The kraft process is otherwise (a) sulphite process (b) sulphate process (c) mechanical process (d) phosphate process	*1*	*K1*	*CO5*

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21.	Define angle of nip.	*2*	*K1*	*CO1*
22.	List out the general characteristics of solids.	*2*	*K1*	*CO1*
23.	Contrast between filtration and Centrifugation.	*2*	*K2*	*CO2*
24.	Infer the factors which influence 'Rate of Mixing'.	*2*	*K2*	*CO2*
25.	Recall the advantage of double pipe heat exchanger.	*2*	*K1*	*CO3*
26.	What is less Volatile component?	*2*	*K1*	*CO3*
27.	Explain Convection process.	*2*	*K2*	*CO4*
28.	Explain Natural Draught Cooling Tower.	*2*	*K2*	*CO4*
29.	List the raw materials used in paper and pulp industry.	*2*	*K1*	*CO5*
30.	What are fluxes?	*2*	*K1*	*CO5*

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31.	a)	Explain the working principle of any one type of crushers and how their design influences their efficiency and application in various industries.	*10*	*K2*	*CO1*
		OR			
	b)	Rephrase different methods for separating solids based on magnetic properties.	*10*	*K2*	*CO1*
32.	a)	Explain the principle construction and working of Double cone classifier.	*10*	*K2*	*CO2*
		OR			
	b)	Explain the principle construction and working of Gravity settling tank.	*10*	*K2*	*CO2*
33.	a)	Draw a neat sketch of kettle reboiler and explain its construction and working.	*10*	*K2*	*CO3*
		OR			
	b)	Illustrate with a neat sketch, distillation column showing feed, condenser and reboiler with a neat sketch.	*10*	*K2*	*CO3*

34.	a)	Explain the Crystallization process in detail.	*10*	*K2*	*CO4*
		OR			
	b)	Discuss on the different types of dryers used in Industry.	*10*	*K2*	*CO4*
35.	a)	Paraphrase the thermal power plant with a neat sketch.	*10*	*K2*	*CO5*
		OR			
	b)	Summarize the process involved in manufacture of paper and pulp.	*10*	*K2*	*CO5*
36.	a) i)	Explain in brief with a neat sketch Swenson-Walker crystallizer.	*5*	*K2*	*CO4*
	ii)	Summarize the process involved in Leather manufacturing process.	*5*	*K2*	*CO5*
		OR			
	b) i)	Draw a neat sketch of long tube evaporator and explain briefly its construction and working.	*5*	*K2*	*CO4*
	ii)	Paraphrase Kraft process with neat sketch.	*5*	*K2*	*CO5*