# PROVISIONAL ANSWER KEY

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| Question Paper Code: | 81/2024/OL |
| Category Code: | 237/2023 |
| Exam: | Lecturer in Chemical Engineering |
| Date of Test | 04-07-2024 |
| Department | Technical Education |

Question1:-When does pressure intensity of the fluid would be same in all the directions?

A:-If and only if the fluid is inviscid

B:-If and only if the fluid is at rest

C:-When there is no relative motion of adjacent layers

D:-Regardless of the relative motion of adjacent layers

Correct Answer:- Option-C

Question2:-How does pressure and power requirements relate to the gas density of a gas fan at a constant velocity and capacity?

A:-Directly

B:-Inversely, as a square root of

C:-Directly as a square root of

D:-Directly as a square of

Correct Answer:- Option-A

Question3:-How slugging in a fluidized bed can be avoided?

A:-Deep bed of solids

B:-Tall, narrow vessel

C:-Very large particles

D:-Shallow beds of solids and proper choice of particle size

Correct Answer:- Option-D

Question4:-What is the suitable example for variable orifice flowmeter?

A:-Venturimeter

B:-Rotameter

C:-Pitot tube

D:-None of the above

Correct Answer:- Option-B

Question5:-What is the drag coefficient of a bacterium (assume the size of 1 um) moving in water at the speed of 1 mm/s? (Assume the kinematic viscosity is $_{10^{-6}m^2}$/s)

A:-0.44

B:-0.24

C:-24000

D:-2400

Correct Answer:- Option-C

Question6:-Which of the following factors influence the decrease in the pressure of a fluid when flows  under isothermal turbulent condition?

A:-Re

B:-Wall roughness

C:-Both 1 and 2

D:-None of the above

Correct Answer:- Option-C

Question7:-Two parallel plates shear a Bingham fluid, with the bottom plate moving at 0.5 m/s and the top plate at 1.5 m/s in the same direction. The plate gap is 1 mm. Let the yield stress be 10 Kpa. What is the shear stress on the plates? Assume the dynamic viscosity as 10 Pas.

A:-10 KPa

B:-20 KPa

C:-21 KPa

D:-11 KPa

Correct Answer:- Option-B

Question8:-A pipe (2 inches in diameter) requires a valve to be inserted. Suggest suitable valve

A:-Plug-cock

B:-Globe

C:-Gate

D:-Check

Correct Answer:- Option-C

Question9:-How the efficiency of the sedimentation tank (constant discharge rate) can be increased?

A:-Increase of depth

B:-Decrease of depth

C:-Increase in surface area

D:-Decrease of surface

Correct Answer:- Option-C

Question10:-Centrifugal pumps are not recommended for which of the following fluids?

A:-Molten sodium

B:-Vegetable oil

C:-Thick molten soap at 80°C

D:-None of the above

Correct Answer:- Option-C

Question11:-A screening operation is used to separate a particulate mixture into undersize and oversize fractions. If the feed contains 20% undersize particles by mass and the screen effectiveness for the undersize fraction is 80%, what is the percentage of undersize in the undersize product?

A:-16

B:-40

C:-80

D:-20

Correct Answer:- Option-A

Question12:-Which of the following combinations of filter cake properties can provide the maximum filtration rate in an industrial filtration process?

A:-High porosity and high compressibility

B:-Low porosity and low compressibility

C:-High porosity but low compressibility

D:-Low porosity but high compressibility

Correct Answer:- Option-C

Question13:-A spherical particle is settling freely in a fluid under gravity. Keeping all other parameters constant, which of the following will most significantly increase the terminal settling velocity of the particle?

A:-Doubling the particle density

B:-Doubling the particle diameter

C:-Halving the fluid density

D:-Halving the fluid viscosity

Correct Answer:- Option-B

Question14:-If the energy required to reduce the particle size of a feed whose 80% pass through a mesh of diameter 25 mm to a product whose 80% pass through a mesh of diameter 4 mm based on Bond's law is 20 kWh/ton, which of the following closely estimates the energy required to further reduce the particle size such that 80% pass through a mesh of diameter 1 mm?

A:-10 kWh/ton

B:-20 kWh/ton

C:-46 kWh/ton

D:-33 kWh/ton

Correct Answer:- Option-D

Question15:-Which of the following is a close estimate of the settling velocity in mm/s of a 50μ spherical particle of density 3700 kg/$m^3$ settling in water at 20°C?

A:-50.3

B:-2000.5

C:-3.7

D:-20.9

Correct Answer:- Option-C

Question16:-Which of the following is true for a particle reaching terminal velocity?

A:-The particle is stagnant

B:-The particle has zero acceleration

C:-The particle is accelerating

D:-The particle is decelerating

Correct Answer:- Option-B

Question17:-Which of the following influences the extent of separation in an industrial sorting classifier?

A:-Difference in size of particles

B:-Difference in densities of particles

C:-Viscosity of the medium

D:-All of the above

Correct Answer:- Option-B

Question18:-For a pile of granular solids, the angle of repose is lower than the angle of internal friction when

A:-The solid particles are very fine or cohesive

B:-Grains at the surface are more loosely bound than those inside the pile

C:-The grains constitute a truly homogeneous mass

D:-None of the above

Correct Answer:- Option-B

Question19:-The collection efficiency of a cyclone separator

A:-Increases with particle diameter and particle density, but decreases with gas viscosity

B:-Increases with particle diameter but decreases with particle density and gas viscosity

C:-Decreases with particle diameter, particle density and gas viscosity

D:-Is not affected by changes in particle density and gas viscosity

Correct Answer:- Option-A

Question20:-The drag coefficient for a particle of diameter 4 mm and density 2500 $kg/m^3$ settling at a velocity of 1.5 m/s in a stagnant fluid of density 1000 $kg/m^3$ and viscosity 0.01 Pa.s is

A:-0.016

B:-0.024

C:-0.44

D:-0.33

Correct Answer:- Option-C

Question21:-Trouton's ratio is defined as the fraction of

A:-Heat of vaporization to heat of vaporization at normal boiling point

B:-Heat of vaporization to the normal boiling point

C:-Heat of vaporization to the heat of vaporization at critical temperature

D:-Heat capacity to the heat capacity at normal boiling point

Correct Answer:- Option-B

Question22:-Carbon black is produced by decomposition of methane as follows : $CH_{4(g)} \rightarrow C_s + 2H_{2(g)}$

The single pass conversion of methane is 60%. If the fresh feed is pure methane and 25% of the methane exiting the reactor is recycled, then calculate the molar ratio of fresh feed stream to recycle stream

A:-0.9

B:-9

C:-10

D:-90

Correct Answer:- Option-B

Question23:-Find the normality of 98 grams/liter $H_2SO_4$

A:-1

B:-2

C:-0.001

D:-0.002

Correct Answer:- Option-B

Question24:-An evaporator is used to concentrate a liquor from 10 to 50 percent solids by weight. If the feed rate of the weak liquor is 1000 kg/h, determine the water evaporated in kg/h.

A:-200

B:-400

C:-600

D:-800

Correct Answer:- Option-D

Question25:-Carbon monoxide combines with chlorine in the presence of a suitable catalyst to form phosgene according to the following reaction : $CO_{(g)} + Cl_{2(g)} \rightarrow COCl_{2(g)}$

After reaction, the products contained 12 moles of phosgene, 4 moles of chlorine and 10 moles of carbon monoxide. Assuming that the original mixture is free of phosgene, calculate the percentage conversion of the limiting reactant

A:-33.33

B:-71.4

C:-75.0

D:-80.0

Correct Answer:- Option-C

Question26:-The ultimate analysis of coal gives

A:-carbon, hydrogen, sulphur, nitrogen

B:-carbon, hydrogen, ash

C:-volatile matter, moisture ash, fixed carbon

D:-volatile matter, moisture, nitrogen, carbon

Correct Answer:- Option-A

Question27:-Recycle streams will have purging operation for

A:-increase yield

B:-reducing the accumulation of inerts

C:-conserving heat

D:-improving efficiency

Correct Answer:- Option-B

Question28:-The heat of combustion of methane, carbon and hydrogen are $-890.4\frac{kJ}{mol}$ , $-393.51\frac{kJ}{mol}$ and $-285.84$ kJ/mol respectively. Find the heat of formation of methane?

A:--75 kJ

B:--150 kJ

C:--1570 kJ

D:--211 kJ

Correct Answer:- Option-A

Question29:-The ratio of actual partial pressure exerted by the vapour to its vapour pressure at the same temperature, expressed as a percentage is called

A:-percent absolute saturation

B:-percent molal humidity

C:-percent humidity

D:-percent relative saturation

Correct Answer:- Option-D

Question30:-The scale that is used to indicate the strength of sugar solution is

A:-API

B:-Baume

C:-Twaddell

D:-Brix

Correct Answer:- Option-D

Question31:-Which of the following statement is/are true?
i. Heat interaction is a path function
ii. Enthalpy change associated with a chemical reaction can be measured with a flow calorimeter
iii. Throttling process is an isenthalpic process

A:-i and iii only

B:-i and ii only

C:-ii and iii only

D:-i, ii and iii

Correct Answer:- Option-D

Question32:-Ratio of fugacity to pressure is known as

A:-fugacity coefficient

B:-activity

C:-activity coefficient

D:-acentric factor

Correct Answer:- Option-A

Question33:-Determine the minimum amount of power required to maintain the temperature of a solution at 200K, when 100 kJ of heat per second is continuously removed from it. Consider the temperature of its surrounding as 300 K

A:-33.33 kW

B:-50 kW

C:-200 kW

D:-300 kW

Correct Answer:- Option-B

Question34:-All spontaneous processes are

A:-reversible

B:-irreversible

C:-reversible adiabatic

D:-adiabatic

Correct Answer:- Option-B

Question35:-The following are the relations between activity coefficient ($\gamma_i$) and mole fraction ($x_i$) of a binary mixture at constant temperature and pressure. Pick the thermodynamically consistent relations

A:-$\ln\gamma_1 = -2x_1 + x_1^2$,
$\ln\gamma_2 = \frac{1}{2}\, x_1^2$

B:-$\ln\gamma_1 = -2x_1 + x_1^2$,
$\ln\gamma_2 = x_1^2$

C:-$\ln\gamma_1 = -2x_1 + x_1^2$,

$\ln\gamma_2 = -\frac{1}{2}x_1^2$

D:-$\ln\gamma_1 = -2x_1 + x_1^2$;
$\ln\gamma_2 = -x_1^2$

Correct Answer:- Option-B

Question36:-Identify the equation that is used to express the excess Gibbs free energy of a binary mixture, where its combinatorial part considers the composition, size and shape of the constituent molecules; and the residual part takes care of the intermolecular forces

A:-van Laar

B:-Wilson

C:-NRTL

D:-UNIQUAC

Correct Answer:- Option-D

Question37:-The composition of a reaction mixture at the point where the Gibbs free energy is _____ is the equilibrium composition at the specified temperature and pressure.

A:-minimum

B:-maximum

C:-constant

D:-zero

Correct Answer:- Option-A

Question38:-Consider a reaction with standard free energy change ΔG° = 200 kJ/kmol. Choose the most appropriate statement regarding the feasibility of this reaction.

A:-Reaction is very unfavourable

B:-Reaction is promising

C:-Reaction may or may not be possible

D:-None of the above

Correct Answer:- Option-C

Question39:-Consider two species **a** and **b**. The partial molar enthalpy of species **a** in the binary mixture is $\bar{h}_a = 100 - 20x_a + 50x_b - 200x_b^2 + 5x_a x_b^2$ , where $x_a$ and $x_b$ are the mole fractions of species **a** and **b**, respectively. Determine the partial molar enthalpy of species **a** at infinite dilution.

A:-–50

B:-80

C:-100

D:-–200

Correct Answer:- Option-A

Question40:-The term representing the net energy cost for a system created at a constant environmental temperature from a negligible initial volume after

subtracting what the environment automatically supplied

A:-Internal energy

B:-Enthalpy

C:-Helmholtz free energy

D:-Gibbs free energy

Correct Answer:- Option-D

Question41:-Critical thickness of insulation of a spherical shell is given by

A:-$\frac{k}{h}$

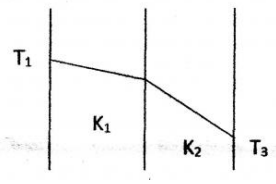
B:-$\frac{4k}{h}$

C:-$\frac{k}{2h}$

D:-$\frac{2k}{h}$

Correct Answer:- Option-D

Question42:-The heat conduction in a composite slab consist of two materials as shown in figure. Which of the following statement is true if the thermal conductivities of the materials are $k_1$ and $k_2$ respectively




A:-$k_1 > k_2$

B:-$k_1 < k_2$

C:-$k_1 = k_2$

D:-None of these

Correct Answer:- Option-B

Question43:-The distance from the leading edge of a flat plate at which the transition will occur for a flow of water with a uniform velocity of 1 m/s is (transition Reynolds Number for flow over a flat plate is $5 \times 10^5$ and kinematic viscosity, v = $0.858 \times 10^{-6} m^2/s$ )

A:-1 m

B:-103 m

C:-43 m

D:-0.43 m

Correct Answer:- Option-D

Question44:-The ratio of the thickness of thermal boundary layer to the thickness of hydro dynamic boundary layer is equal to (Prandtl number)$^n$ , where $n$ is

A:-$\frac{1}{3}$

B:-$-\frac{1}{3}$

C:-0.8

D:-0.2

Correct Answer:- Option-B

Question45:-Consider two black bodies with surfaces $S_1$ (area = 1m$^2$) and $S_2$ (area = 6m$^2$). They exchange heat only by radiation, 60% of the energy emitted by $S_1$ is received by $S_2$. The fraction of energy emitted by $S_2$ that is received by $S_1$ is

A:-0.05

B:-0.1

C:-0.4

D:-0.6

Correct Answer:- Option-B

Question46:-Which of the following statements are true in the case of an ideal black body?
(P) The emissivity of black body radiation is 1.
(Q) The radiation emitted by a black body is of different wavelengths lying in regions of ultraviolet, visible and infrared
(R) The transmittivity of black body is 1.
(S) The lack body radiation curve at different temperature peaks at a wavelength is directly proportional to temperature

A:-P only

B:-P and Q only

C:-Q and R only

D:-R and S only

Correct Answer:- Option-B

Question47:-For turbulent flow in a pipe, assuming Seider-Tate correlation is valid, the heat transfer coefficient varies with the pipe diameter D as

A:-$D^{1.8}$

B:-$D^{-1.8}$

C:-$D^{0.2}$

D:-$D^{-0.2}$

Correct Answer:- Option-D

Question48:-A copper ball of 5 cm diameter at 300°C is suddenly immersed in water at 30°C. It cools down to 150°C in 70s. It is then reheated to the initial temperature of 300°C and suddenly exposed to air at 30°C where it cools down to 150°C in 200s. The difference in cooling time is due to

A:-Larger specific heat of water

B:-Smaller heat transfer coefficient of waters

C:-Larger heat transfer coefficient of water

D:-All of these

Correct Answer:- Option-C

Question49:-An electrically heated element is submerged in a pool of water at its

saturation temperature. As the temperature of the element increases the Leidenfrost point is observed at

A:-In the free convection regime

B:-In the incipient nucleate boiling regime

C:-In the stable film boiling regime

D:-None of these

Correct Answer:- Option-C

Question50:-A current of 200 A is passed through a stainless steel wire [k = 19 W/m °C] 2mm in diameter. The resistance of the steel wire may be taken as 0.1 Ω. And the length of the wire is 1 m. The wire is submerged in a liquid at 110°C and experiences a convection heat transfer coefficient of 4 kW/$m^2$. °C. The center temperature of the wire is

A:-600°C

B:-178°C

C:-274 °C

D:-None of these

Correct Answer:- Option-C

Question51:-In the case of mass transfer between two phases in contact, when the two phases attain equilibrium

A:-Concentration of all components will be equal in both the phases

B:-Composition of the contacting phases will be equal

C:-Partial pressure of components will be equal in both the phases

D:-Chemical potential of the components will be identical in both the phases

Correct Answer:- Option-D

Question52:-The concentration distribution for diffusion of A through stagnant B under steady state is

A:-linear

B:-logarithmic

C:-hyperbolic

D:-parabolic

Correct Answer:- Option-B

Question53:-Pick out incorrect statement from the following

A:-At dew point partial pressure of vapour equals vapour pressure of the liquid

B:-When temperature of a vapour-gas mixture is reduced below dew point, condensation of vapour occurs

C:-At dew point, dry bulb temperature is greater than wet bulb temperature

D:-The difference between dry bulb temperature and wet bulb temperature is called wet bulb depression

Correct Answer:- Option-C

Question54:-In the case of simultaneous heat and mass transfer occurring in boundary layer flow, the temperature and concentration profiles are identical when

A:-Lewis number = 1

B:-Prandtl number = 1

C:-Schmidt number = 1

D:-Grashoff number = 1

Correct Answer:- Option-A

Question55:-Which of the following dryers is suitable for drying a feed in the form of solution into a dried particulate product in a single operation?

A:-Tunnel dryer

B:-Spray drier

C:-Tray drier

D:-Shelf drier

Correct Answer:- Option-B

Question56:-Which of the following is true in the case of solvents used in liquid-liquid extraction?

A:-No separation is possible when selectivity is equal to one

B:-No separation is possible when distribution coefficient is equal to one

C:-The larger the distribution coefficient, larger the amount of solvent needed for separation

D:-All the above

Correct Answer:- Option-A

Question57:-Which of the following factors are favourable for leaching operation?

A:-Low temperature

B:-Large particle size in the solid feed

C:-Low viscosity of the solvent used

D:-All the above

Correct Answer:- Option-C

Question58:-In the case of absorption of solute from gas phase to liquid phase, if the solute is readily soluble in the liquid

A:-Equilibrium curve is steep

B:-Mass transfer is gas phase controlled

C:-Both 1 and 2

D:-Mass transfer is liquid phase controlled

Correct Answer:- Option-D

Question59:-Which of the following is applicable to chemical adsorption?

A:-Multilayer adsorption occurs

B:-Adsorption is not possible above critical temperature

C:-Heat of adsorption is of the order of heat of reaction

D:-All the above

Correct Answer:- Option-C

Question60:-Identify correct statement out of the following.

A:-The lower the relative volatility, the easier the separation of components by distillation

B:-As reflux ratio increases, slope of operating line increases

C:-If reflux ratio is increased, the number of plates needed for separation also increases

D:-All the above

Correct Answer:- Option-B

Question61:-Match the process in Group I with the catalyst in Group II

| Group I | Group II |
|---|---|
| P. Fischer-Tropsch Synthesis | I Nickel |
| Q. Formaldehyde from methanol | II. $Fe_2O_3$ |
| R. Hydrogenation of vegetable oil | III. Silver |
| S. Dehydrogenation of Ethyl benzene | IV. Cobalt |

A:-P-III, Q-IV, R-I, S-II

B:-P-IV, Q-II, R-I, S-III

C:-P-IV, Q-III, R-I, S-II

D:-P-III, Q-IV, R-II, S-I

Correct Answer:- Option-C

Question62:-In petroleum refining, catalytic reforming is used to convert

A:-paraffins and naphthenes to aromatics

B:-paraffins to hydrogen and carbon monoxide

C:-gas oil to diesel and gasoline

D:-light olefins to gasoline

Correct Answer:- Option-A

Question63:-Match the polymer in Group I to the polymer characteristics in Group II

| Group I | Group II |
|---|---|
| P. Polyethylene | I. Elastomer |
| Q. Phenol-formaldehyde | II. Fiber |
| R. Polyisoprene | III. Thermoplastic |
| S. Polyester | IV. Thermosetting |

A:-P-III, Q-IV, R-I, S-II

B:-P-IV, Q-II, R-III, S-I

C:-P-III, Q-II, R-I, S-IV

D:-P-IV, Q-III, R-I, S-II

Correct Answer:- Option-A

Question64:-Which one of the following sequences is arranged according to increasing calorific value?

A:-Producer gas, natural gas, water gas

B:-Natural gas, producer gas, water gas

C:-Producer gas, water gas, natural gas

D:-Water gas, natural gas, producer gas

Correct Answer:- Option-C

Question65:-Hydrotreating is used for

A:-Removal of water from crude oil

B:-Treatment of crude oil with water

C:-Improving octane number of gasoline

D:-Removal of sulphur and nitrogen from petroleum fraction

Correct Answer:- Option-D

Question66:-For making superphosphate by acidulation of phosphate rock, use of nitric acid is desirable, because

A:-Nitric acid is less expensive than sulphuric acid

B:-The availability of nitrogen enhances the value of the superphosphate as a fertilizer

C:-The process produce non hygroscopic super phosphate

D:-The process produces superphosphate having higher phosphorous content than the sulphuric acid

Correct Answer:- Option-D

Question67:-The active component of catalyst used in steam reforming of methane to produce synthesis gas is

A:-iron

B:-platinum

C:-nickel

D:-palladium

Correct Answer:- Option-C

Question68:-Match the product in Group I to the raw material in Group II

| Group I | Group II |
|---|---|
| P. Ethylene | 1. Natural gas |
| Q. Methanol | 2. Synthesis gas |
| R. Phthalic anhydride | 3. Naphtha |
| | 4. Naphthalene |

A:-P-1, Q-2, R-3

B:-P-2, Q-1, R-4

C:-P-3, Q-1, R-4

D:-P-3, Q-2, R-4

Correct Answer:- Option-D

Question69:-Which of the following is detergent?

A:-Benzene hexachloride

B:-Alkyl benzene sulphonate

C:-Polyvinyl chloride

D:-Cellulose nitrate

Correct Answer:- Option-B

Question70:-Which of the following is not employed in the commercial production of linear PVC?

A:-Emulsion polymerization

B:-Suspension polymerization

C:-Addition polymerization

D:-Condensation polymerization

Correct Answer:- Option-C

Question71:-Methanator is used in the ammonia plant for _____.

A:-Conversion of hydrogen to methane

B:-Conversion of water vapour to methane

C:-Conversion of oxides of carbon to methane

D:-Conversion of methane to Hydrogen

Correct Answer:- Option-C

Question72:-Fertilizer produced during soda ash manufacture by dual process is ammonium

A:-Sulphate

B:-Chloride

C:-Phosphate

D:-Nitrate

Correct Answer:- Option-B

Question73:-$H_3PO_4$ is the chemical formula of _____ phosphoric acid.

A:-Ortho

B:-Pyro

C:-Meta

D:-Beta

Correct Answer:- Option-A

Question74:-Which of the following is desirable in gasoline but undersirable in kerosene?

A:-Naphthenes

B:-Olefins

C:-Aromatics

D:-Paraffins

Correct Answer:- Option-C

Question75:-Match each of the polymers in Group I with raw material in Group II, from which they are made.

| Group I | Group II |
|---|---|
| P. Polyester | I. Ethylene Glycol |
| Q. Polyamide | II. Adipic acid |
| R. Viscose Rayon | III. Cellulose |
| S. Epoxy resin | IV. Bisphenol. |

A:-P-I, Q-II, R-III, S-IV

B:-P-II, Q-I, R-III, S-IV

C:-P-I, Q-II, R-IV, S-III

D:-P-III, Q-II, R-IV, S-I

Correct Answer:- Option-A

Question76:-Styrene is produced from ethyl benzene by the process of

A:-Alkylation

B:-Dehydrogenation

C:-Oxidation

D:-Dehydration

Correct Answer:- Option-B

Question77:-Which process is widely used to treat all types of woods to pulp?

A:-Mechanical pulping

B:-Neutral Sulfite Semi Chemical (NSSC)

C:-Thermo Mechanical

D:-Kraft

Correct Answer:- Option-D

Question78:-Nylon 66 is so named because

A:-The average degree of polymerization of the polymer is 1966

B:-The number of carbon atoms between two nitrogen atoms are 6

C:-The number of nitrogen atoms between two carbon atoms are 6

D:-The polymer was first synthesized in 1966

Correct Answer:- Option-B

Question79:-The commonly used solvent in supercritical extraction is

A:-Methyl ethyl ketone

B:-Water

C:-Carbon tetra chloride

D:-Carbon dioxide

Correct Answer:- Option-D

Question80:-Commercially, ethylene is produced from naphtha by

A:-Catalytic cracking

B:-Thermal cracking

C:-Catalytic reforming

D:-Hydrocracking

Correct Answer:- Option-B

Question81:-Which among the following represents dynamic characteristics of an instrument?

A:-Sensitivity and lag

B:-Reproducibility and drift

C:-Speed of response and lag

D:-Sensitivity and dead zone

Correct Answer:- Option-C

Question82:-Which of the following thermocouples are used for high temperature measurement?

A:-Copper-constantan

B:-Iron-Constantan

C:-Platinum-Platinum, 13% rhodium

D:-Chromel-alumel

Correct Answer:- Option-C

Question83:-Which of the following regarding the response of manometers for a step change is correct

A:-Manometers have overdamped response

B:-Manometers have underdamped response

C:-Manometers have critically damped response

D:-None of the above

Correct Answer:- Option-B

Question84:-The law stated as "the algebraic sum of the thermal emf's in a circuit composed of any number of dissimilar metals is zero, if all the circuit is at a uniform temperature" is called as

A:-Seebeck effect

B:-Law of intermediate temperatures

C:-Law of homogeneous circuit

D:-Law of intermediate metals

Correct Answer:- Option-D

Question85:-The inverse Laplace transform of the function F(s) given below is $F(s)=\frac{1}{s(s+1)}$

A:-$1-e^{-t}$

B:-$1+e^{t}$

C:-$1-e^{t}$

D:-$1+e^{-t}$

Correct Answer:- Option-A

Question86:-In an on/off controller the gain Kc is made

A:-Very high

B:-Low

C:-Can be either low or high

D:-None of these

Correct Answer:- Option-A

Question87:-Which of the following statement is true regarding a PI controller?

A:-does not change the order of response and offset is not eliminated

B:-order of response increases and offset is eliminated

C:-order of response decreases and offset is eliminated

D:-decrease in speed of response and increase in damping

Correct Answer:- Option-B

Question88:-An explosion in which reaction front moves at a speed greater than the speed of sound in an unreacted medium is called

A:-Deflgration

B:-Unconfined explosion

C:-BLEVE

D:-Detonation

Correct Answer:- Option-D

Question89:-Class E fire is produced due to

A:-Organic solids

B:-Combustible liquids such as petrol

C:-Flammable gases

D:-Electrical apparatus

Correct Answer:- Option-D

Question90:-The degree to which an instrument indicate the changes in measured variable without dynamic error is called

A:-Fidelity

B:-Lag

C:-Reproducibility

D:-Sensitivity

Correct Answer:- Option-A

Question91:-Trickling filter is an

A:-Anaerobic attached growth process

B:-Anaerobic suspended growth process

C:-Aerobic attached growth process

D:-Aerobic suspended growth process

Correct Answer:- Option-C

Question92:-Blue Baby syndrome is due to the presence of excess _____ in drinking water.

A:-Chlorides

B:-Flourides

C:-Sulphates

D:-Nitrates

Correct Answer:- Option-D

Question93:-BOD is used as a characteristic of

A:-Drinking water

B:-River water

C:-Industrial effluents

D:-Cooling water

Correct Answer:- Option-C

Question94:-The angle between the solar collector surface plane and the horizontal plane is called

A:-Angle of declination

B:-Azimuth angle

C:-Angle of incidence

D:-Tilt angle

Correct Answer:- Option-D

Question95:-Main product obtained from fermentation of biomass is

A:-Biogas

B:-Ethanol

C:-Methane

D:-Heavy oil

Correct Answer:- Option-B

Question96:-Permanent hardness of water can be removed by

A:-Boiling

B:-Sedimentation

C:-Filtration

D:-Ion exchange

Correct Answer:- Option-D

Question97:-Electrodialysis removes

A:-Suspended solids from water

B:-Dissolved solids from water

C:-Dissolved gases from water

D:-None of the above

Correct Answer:- Option-B

Question98:-The permissible pH of drinking water is

A:-1-6

B:-6.5-8.5

C:-9-11

D:-4-7

Correct Answer:- Option-B

Question99:-Which of the following is not a method of disinfection of water?

A:-Boiling

B:-UV radiation

C:-Chlorination

D:-Filtration

Correct Answer:- Option-D

Question100:-What is the power in wind, if velocity of the wind is 20 m/s and the blade length is 60 m. Assume air density as 1.23 kg/$m^3$

A:-55.64 MW

B:-13.91 MW

C:-25.3 MW

D:-12.5 kW

Correct Answer:- Option-A