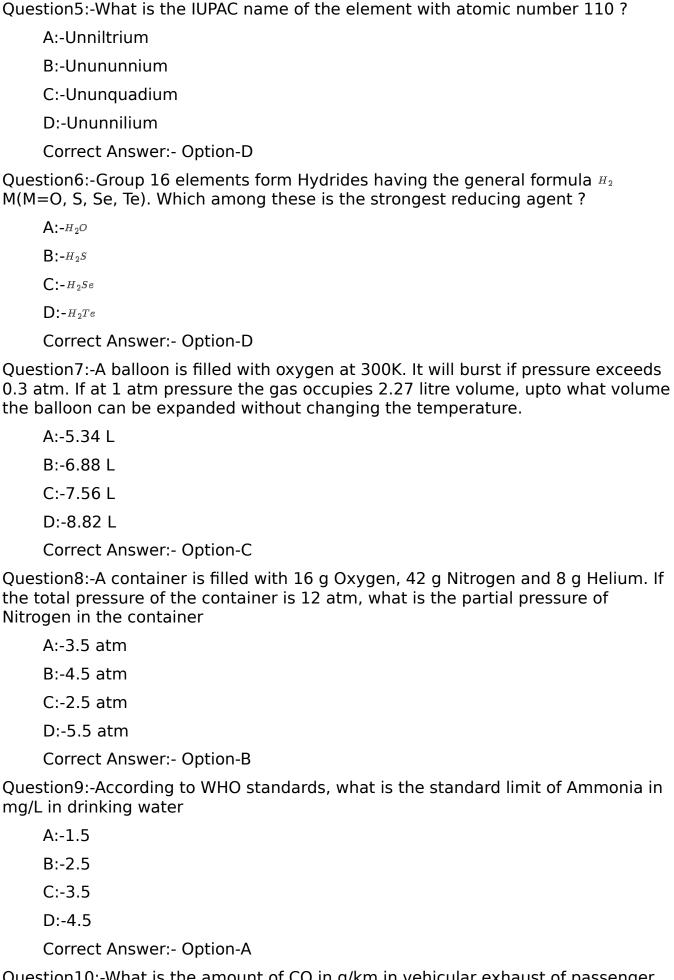
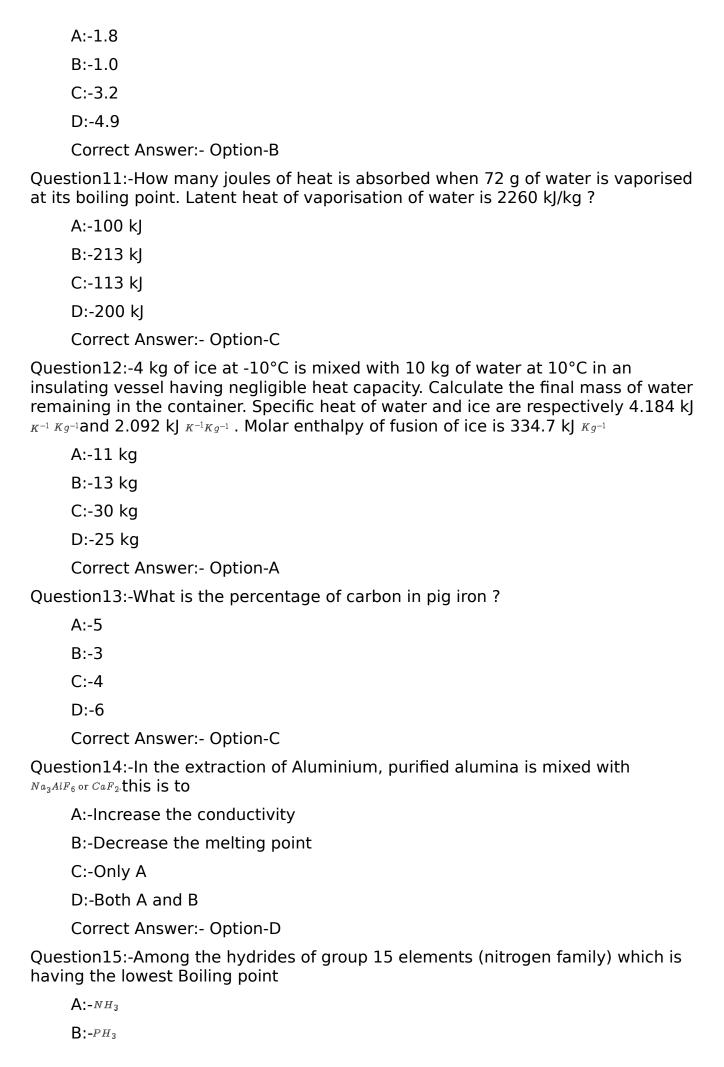
## **PROVISIONAL ANSWER KEY**

		Question Paper Code:	135/2024/OL	
		Category Code:	648/2023	
		Exam:	Junior Instructor in Laboratory Assistant (Chemical Plant)	
		Date of Test	19-12-2024	
		Department	Industrial Training	
the s	same el	ement hydrog	ydrogen combines with oxygen to form water as a product gen combines with oxygen to form hydrogen peroxide as aw of chemical combination is illustrated in this example.	
	A:-Law	of Definite Pr	roportion	
	B:-Law	ion of mass		
	C:-Law of Multiple proportion			
	D:-Avo	vogadros Law		
	Correct	Answer:- Op	tion-C	
	stion2:-0 00 ml of		Molarity of a solution prepared by dissolving 20 g of NaOH	
	A:-1M			
	B:-0.5N	1		
	C:-2M			
	D:-1.5N	1		
	Correct	Answer:- Op	tion-A	
Que	stion3:-I	Equilibrium co	onstant for the reaction $N_2+3H_2 \rightleftharpoons 2NH_3$ is 7. What is the	
equi	librium	constant for t	the reaction $4NH_3 \rightarrow 2N_2 + 6H_2$	
	A:-7			
	B:-1/7			
	C:-49			
	D:-1/49			
	Correct	Answer:- Op	tion-D	
Que	stion4:-I	How many ele	ectrons are present in the 4S atomic orbital of ${}_{24}{}^{Cr}$ atom ?	
	A:-2			
	B:-3			
	C:-1			
	D:-5			
	Correct	Answer:- Op	tion-C	



Question10:-What is the amount of CO in g/km in vehicular exhaust of passenger cars according to Bharath Stage 4 Norms?



C:-AsH<sub>3</sub>

 $D:-SbH_3$ 

Correct Answer:- Option-B

Question16:-PCl<sub>5</sub> contains two types of P-Cl bond called axial and equatorial bond. The bond length of P-Cl equatorial bond is 202 pm. What is the bond length of P-Cl axial bond?

A:-202 pm

B:-200 pm

C:-240 pm

D:-198 pm

Correct Answer:- Option-C

Question17:-Equilibrium is affected by change in temperature. What happens to the following equilibrium, when temperature is increased  $2NO2(g) \rightleftharpoons N2O4(g) \Delta H = -57.2 \text{ kJ}_{mol}^{-1}$ 

A:-Rate of forward reaction increases

B:-Rate of backward reaction increases

C:-No change in the rate of reaction

D:-None of the above

Correct Answer:- Option-B

Question18:-A compound contains the elements Carbon, hydrogen and Oxygen with percentage mass 26.08, 4.34 and 69.5 respectively. What is the Empirical Formula of the compound?

A:-CH2O2

B:-CH<sub>3</sub>O<sub>2</sub>

C:-CH<sub>2</sub>O<sub>3</sub>

D:-CH2O

Correct Answer: - Option-A

Question19:- ${}^{60}C_{^{O}_{27}}$  decays with a half life of 69.3 years to produce  ${}^{60}N_{^{i}_{28}}$ . What is the decay constant of the radioactive disintegration of  ${}^{60}C_{^{O}_{27}}$ 

A:-100 years

B:-10 years

C:-0.1 year

D:-0.01 year

Correct Answer:- Option-D

Question 20:-When a positron is emitted from an atom, the mass number and atomic number of the daughter nucleus ?

A:-Mass number increases, atomic number remains the same

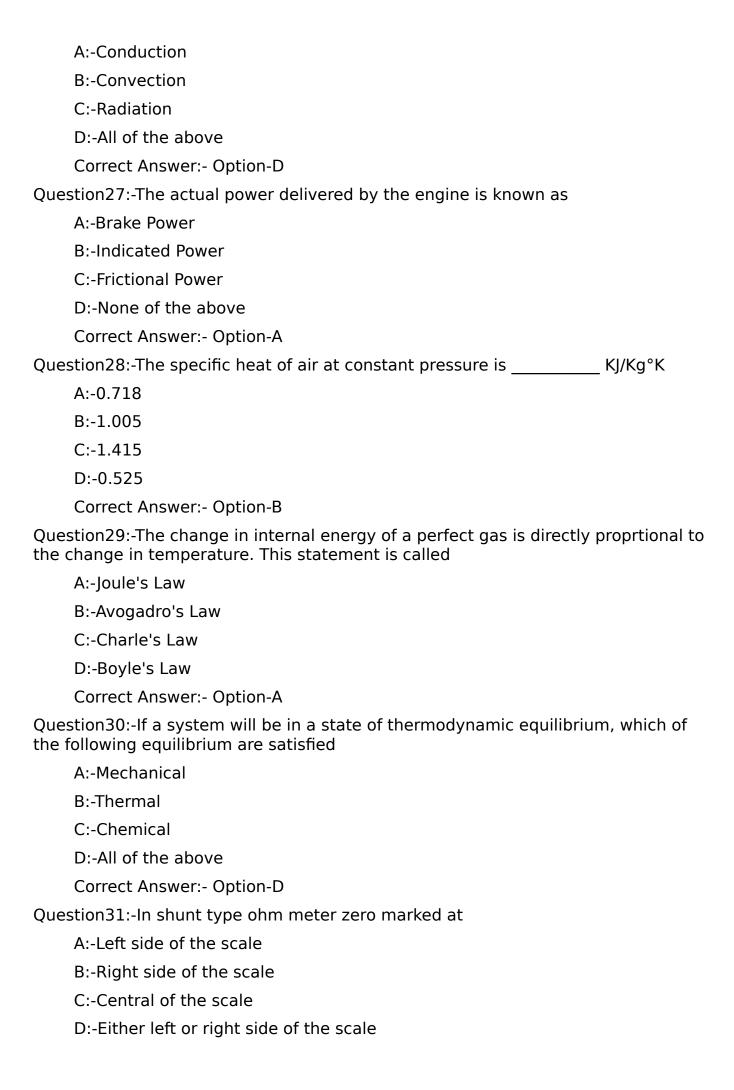
B:-Mass number does not changes, atomic number decreases

C:-Mass number does decreases, atomic number does not changes D:-Mass number does decreases, atomic number decreases Correct Answer:- Option-B Question21:-The motion of a couple is A:-Combined translatory and rotational B:-Rotational C:-Translatory D:-Oscillatory Correct Answer:- Option-B Question22:-The ratio of the distance moved by the effort to the distance moved by the load is called A:-Efficiency B:-Acceleration C:-Mechanical advantage D:-Velocity Ratio Correct Answer: - Option-D Ouestion 23:-The ratio of linear stress to the linear strain is called A:-Modulus of Rigidity B:-Bulk Modulus C:-Modulus of Elasticity D:-Factor of Safety Correct Answer:- Option-C Question24:-According to , when a material is loaded within elastic limit, the stress is directly proportional to strain A:-Hooke's Law B:-Mohr's Law C:-Lami's Theorem D:-Varingon's Theorem Correct Answer:- Option-A Question25:-The heat energy stored in the gas and used for increasing its temperature is known as A:-Molecular Energy B:-Kinetic Energy C:-Internal Energy

Question26:-Heat transfer is possible from one body to another by

D:-External Energy

Correct Answer:- Option-C



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Correct Answer:- Option-A
Question32:-What material is used for cover submarine cable?
     A:-Paper and Paraffin Wax
     B:-Gutta percha
     C:-Bitumen Gutta percha
     D:-Porcelain
     Correct Answer:- Option-B
Question33:-What is the coefficient of linear expansion of COPPER at 20°C?
     A:-17×10-6 per°C
     B:-0.17×10-6 per°C
     C:-17×10-6per°C
     D:-0.017×10<sup>-6</sup>per°C
     Correct Answer:- Option-C
Question34:-One Calorie equal to
     A:-0.4184 107ergs
     B:-418.4 107ergs
     C:-41.84 10<sup>7</sup>ergs
     D:-4.184 10<sup>7</sup>ergs
     Correct Answer:- Option-D
Question35:-Which fuse element used in GEC HRC cartridge fuse?
     A:-Silver
     B:-Copper
     C:-Aluminum
     D:-Lead-tin alloy
     Correct Answer:- Option-A
Question36:-What is the dielectric constant of pure water?
     A:-80
     B:-155
     C:-50
     D:-1
     Correct Answer:- Option-A
Question37:-What is the electrochemical equivalent of mercury?
     A:-2.0791 milli-gram/coulomb
     B:-0.304 milli-gram/coulomb
     C:-1.0738 milli-gram/coulomb
     D:-1.118 milli-gram/coulomb
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Correct Answer:- Option-A

Question38:-What is the minimum resistance can obtain by combining of three resistance each of value 1/3 ohm them?

A:-1/6 Ohm

B:-3 Ohm

C:-1 Ohm

D:-1/9 Ohm

Correct Answer:- Option-D

Question39:-What is the colour of pure Zinc

A:-Bluish White

B:-Bluish Gray

C:-Bluish Red

D:-Bluish Yellow

Correct Answer:- Option-A

Question 40:-Which rule makes a connection to the switch as live controller?

A:-Rule 50

B:-Rule 66

C:-Rule 32

D:-Rule 63

Correct Answer:- Option-C

Ouestion41:-1 Torr =

A:-19.34  $\times$  10<sup>-3</sup> PSI

B:-19.34  $\times$  10<sup>-6</sup> PSI

 $C:-19.34 \times 10^{-4} PSI$ 

D:-19.34  $\times$  10<sup>-5</sup> PSI

Correct Answer: - Option-A

Question42:-Among the following statement which is/are correct about the thermal conductivity gauge

- i) it is used for the measurement of vacuum
- ii) Pirani gauge is an example for thermal conductivity gauge
- iii) Ionization gauge is an example for thermal conductivity gauge

A:-Only (ii and iii)

B:-Only (i and iii)

C:-All of the above (i, ii and iii)

D:-Only (i and ii)

Correct Answer:- Option-D

Question43:-Which of the following statement is/are wrong in the case of filled system thermometer?

- i) The bourdon tube coils tights as pressure increases and uncoils as pressure decreases.
- ii) Due to immersion error a lower temperature is indicated by the thermometer
- iii) Accuracy and temperature span is much higher compared to electrical type instruments

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A:-Only (i and ii)
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B:-All of the above (i, ii and iii)

C:-Only (i and iii)

D:-Only (ii and iii)

Correct Answer:- Option-C

Question44:-Which thermocouple has the most linear characteristics

A:-Type J

B:-Type K

C:-Type R

D:-Type S

Correct Answer:- Option-B

Question45:-Which of the following statement is/are true in the case of two position controlller

- i) process disturbances and interferences causes the output to cycle rapidly.
- ii) a differential gap is added to prevent cycling.
- iii) two position controllers are generally hydraulic devices.

A:-Only (i and iii)

B:-(Only (ii and iii)

C:-Only (i and ii)

D:-All of the above (i, ii and iii)

Correct Answer:- Option-C

Question46:-Hydraulic controllers are used where

A:-Both high power and slow speed of response are required

B:-Both high power and fast speed of response are required

C:-Both low power and fast speed of response are required

D:-Both low power and slow speed of response are required

Correct Answer:- Option-B

Question47:-To avoid loading effects, a transducer should have

A:-High input impedance and High output impedance

B:-Low input impedance and High output impedance

C:-Low input impedance and Low output impedance

D:-High input impedance and Low output impedance

Correct Answer:- Option-D

Question48:-Which of the following statement is wrong regarding SMART transmitter

- i) calibrate the unit over much wider range
- ii) smart transmitters have lower error and lower rangeability
- iii) smart transmitters allow only one way communication

A:-Only (ii and iii)

B:-Only (i and iii)

C:-All of the above (i, ii and iii)

D:-Only (i and ii)

Correct Answer:- Option-A

Question49:-Which of the following statements are wrong regarding circular chart recorder?

- i) Time lines are straight lines
- ii) Chart based on polar coordinates
- iii) readability is the same for all values of scale

A:-Only (ii and iii)

B:-Only (i and iii)

C:-All of the above (i, ii and iii)

D:-Only (i and ii)

Correct Answer:- Option-B

Question 50:-Which of the following statements are true regarding strip chart recorder?

- i) A graphic recorder
- ii) Self balancing type recorder
- iii) They are generally used on the potentiometric type instrument

A:-Only (ii and iii)

B:-Only (i and iii)

C:-All of the above (i, ii and iii)

D:-Only (i and ii)

Correct Answer:- Option-C

Question51:-The halogens present in an organic compound is determined by

A:-Kjeldahl's method

B:-Duma's method

C:-Carius method

D:-Fusion method

Correct Answer:- Option-C

Question52:-The product formed by the hydroboration oxidation of but-1-ene is

A:-Butanal

B:-Butanone

C:-Butan-2-ol

D:-Butan-1-ol

Correct Answer: - Option-D

Question53:-(+)-Sucrose is known as table sugar. Select the incorrect statement about sucrose from the following

A:-It is a non reducing sugar

B:-It reduces Tollen's reagent

C:-It doesnot form osazone

D:-It undergoes hydrolysis

Correct Answer:- Option-B

Question54:-At the isoelectric point, amino acids exist as

A:-Dipolar ion with a zero net charge

B:-Dipolar ion with a positive net charge

C:-Dipolar ion with a negative net charge

D:-Non polar form

Correct Answer:- Option-A

Question55:-The correct statement about the heterocyclic compound Pyridine is

A:-It undergoes electrophilic, substitution reaction under vigorous condition and the substitution occurs mainly at the 3-position

B:-It undergoes electrophilic, substitution reaction easily at the 3-position

C:-It undergoes electrophilic, substitution easily at the 2-position

D:-It undergoes Friedel-Crafts reaction easily

Correct Answer:- Option-A

Question56:-Condensation of two molecules of dimethyl aniline with one molecule of benzaldehyde produce the dye

A:-Fluorescein

B:-Crystal violet

C:-Malachite green

D:-Congo red

Correct Answer:- Option-C

Question57:-The strengths of Acetic acid (I), chloroacetic acid (II), dichloroacetic acid (III) and trichloroacetic acid (IV) follow the order

A:-I > II > III > IV

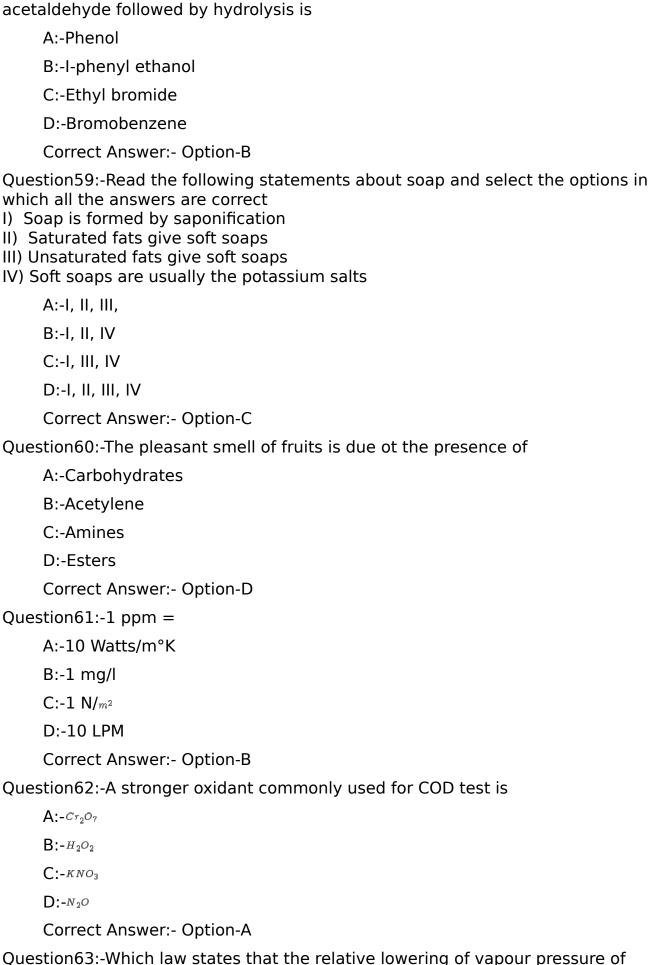
B:-II > I > III > IV

C:-I > IV > III > II

D:-IV > III > II > I

Correct Answer:- Option-D

Question 58:- The product formed when phenyl magnesium bromide reacts with



solution is equal to the mole fraction of the solute?

A:-Boyl's law

B:-Dalton's law C:-Rault's law D:-Henry's law Correct Answer:- Option-C Question64:-The indicator used to determine hardness of water by EDTA method A:-Phenolphthalein B:-Methyl orange C:-Potassium permanganate D:-Eriochrome black-T Correct Answer: - Option-D Question65:-The another name of carbamide A:-Carbon tetrachloride B:-Urea C:-Ammonia D:-Carbon dioxide Correct Answer:- Option-B Question66:-Temporary hardness of water can be removed by A:-Filtration B:-de-mineralisation C:-Boiling D:-Freezing Correct Answer:- Option-C Question67:-Hydrated sodium alumino silicate is known as A:-Zeolite B:-Soda ash C:-Brine D:-Hypocholorous acid Correct Answer:- Option-A Question68:-Negative logarithm of hydrogen ion concentration is called A:-Acidity **B:-Alkalinity** C:-pH D:-Turbidity Correct Answer:- Option-C Question69:-The major raw material for the manufacture of phosphorous fertilizer is

A:-Phosphate rock

B:-Phosphoric acid C:-Hydrogen phosphate D:-Phosphorous pentoxide Correct Answer:- Option-A Question 70: - Hardness can be expressed in terms of equivalents of A:-Calcium sulphate B:-Calcium carbonate C:-Calcium phosphate D:-Calcium chloride Correct Answer:- Option-B Question71:-In Orsat's apparatus KOH is used to absorb A:-Oxygen B:-Carbon dioxide C:-Carbon monoxide D:-Nitrous oxide Correct Answer:- Option-B Question72:-Bomb Calorimeter is used for determining the calorific value of A:-Solid fule B:-Liquid fuel C:-Gaseous fuel D:-Both (A) and (B) Correct Answer:- Option-D Question73:-Coal having maximum carbon content and maximum calorific value is A:-Peat **B:-Bitumionous** C:-Anthracite D:-Lignite Correct Answer:- Option-C Question74:-The amount of Nitrogen in coal is determined by A:-Proximate analysis B:-Burning it completely in air C:-Burning it in absence of air

Question75:-If flue gas contain Carbon monoxide it indicates i) Complete combustion

D:-Ultimate analysis

Correct Answer:- Option-D

- ii) Incomplete combustion
- iii) Short supply of oxygen
- iv) Oxygen is excess
  - A:-Only (i)
  - B:-Only (ii and iv)
  - C:-Only (i and iv)
  - D:-Only (ii and iii)

Correct Answer:- Option-D

Question 76:- Which of the following contain highest percentage of volatile matter?

- A:-Peat
- **B:-Bituminous**
- C:-Anthracite
- D:-Lignite

Correct Answer:- Option-A

Question77:-Presence of functional groups in an organic compound can be determined by

- A:-IR spectroscopy
- B:-Microwave spectroscopy
- C:-UV spectroscopy
- D:-Any of the above

Correct Answer:- Option-A

Question 78:-If the molar concentration of the sample is tripled and length of the path of the beam through the sample is doubled, then absorbance at a particular wavelength will be

- A:-3 times
- B:-2/3 times
- C:-3/2 times
- D:-6 times

Correct Answer:- Option-D

Question79:-Particle size analysis can be done using sieve analysis for the particle diameter

- A:-Less than 0.075 mm
- B:-Less than 0.075 microns
- C:-Less than 75 microns
- D:-Greater than 0.075 mm

Correct Answer:- Option-D

Question80:-In Tyler standard screens the 200 mesh screen have an opening of 0.0029 inch. 150 mesh screen, a coarser screen placed just above the 200 mesh screen will have an opening of size

A:-0.0058 inch

B:-0.0041 inch

C:-0.0036 inch

D:-0.0015 inch

Correct Answer:- Option-B

Question81:-Alkaloid present in black pepper is

A:-Caryophyllene

**B:-Piperine** 

C:-Cinnamaldehyde

D:-1-phellandrene

Correct Answer:- Option-B

Question82:-If carbon content of steel is increased, which of the following parameter of steel will be reduced?

A:-Brittleness

**B:-Hardness** 

C:-Ductility

D:-None of the above

Correct Answer:- Option-C

Question83:-Effect of vanadium on properties of alloy steel is

A:-To lower melting point

B:-To modify colour

C:-To provide better castability

D:-To enhance Tensile strength

Correct Answer:- Option-D

Question84:-Rancidity of lipids or fat rich food is due to

A:-Oxidation of fatty acids

B:-Hydrogenation of unsaturated fatty acids

C:-Reduction of fatty acids

D:-Dehydrogenation of saturated fatty acids

Correct Answer:- Option-A

Question85:-Partial hydrogenation of vegetable oils in presence of Ni catalyst at 200°C gives

A:-Vanaspati ghee

B:-Margarine

C:-Both (A) and (B)

D:-None of these

Correct Answer:- Option-A

Question86:-The salt used in fruit processing operations below 0.1% is

A:-Calcium

B:-Magnesium

C:-Sodium

D:-None of these

Correct Answer:- Option-A

Question87:-The test used to evaluate the efficacy of preservatives is

A:-Preservative characteristic test

B:-Preservative challenge test

C:-Preservative activity test

D:-LAL test

Correct Answer:- Option-B

Question88:-Identify the compound that does not act as a target for drug action in the human body

A:-RNA

B:-DNA

C:-Vitamin C

D:-Protein

Correct Answer:- Option-C

Question89:-Animal fats having a greater proportion of saturated acid residues have

A:-Low iodine value

B:-Low saponification value

C:-High iodine value

D:-None of these

Correct Answer: - Option-A

Question 90:- The indicator for adulteration of ghee is

A:-Acid value

B:-lodine value

C:-Saponfication value

D:-Reichert Meissl value

Correct Answer:- Option-D

Question 91:- Which of the following is a major use of phase-contrast microscopy

- A:-Observing the chemical composition of microbial cells
- B:-Analyzing fluorescence-labeled cellular structures
- C:-Examining microbial motility and live cell morphology
- D:-Identifying genetic material within eukaryotic cells

Correct Answer:- Option-C

Question92:-In the context of membrane filters used for liquid sterilisation, what does 'pore size' refer to and why is it important?

- A:-The thickness of the filter, which determines the filter's ability to withstand high pressure
- B:-The diameter of the tiny holes in the filter, which controls the size of microorganisms that can pass through
- C:-The uniformity of the filter material's density, which affects its filtration efficiency
  - D:-The surface area of the filter, which directly determines the filtration speed Correct Answer:- Option-B

Question93:-Which among the following statements regarding capsules and slime layers is correct?

- A:-A capsule is tightly attached and excludes small particles, while a slime layer is loosely attached and more easily deformed
  - B:-A capsule is less involved in biofilm formation compared to a slime layer
- C:-A capsule is always visible under a microscope, whereas a slime layer cannot be seen
- D:-A capsule is typically found in Gram-negative bacteria, while a slime layer is found in Gram-positive bacteria

Correct Answer:- Option-A

Question 94:- Which of the following is an example of a Gram-positive microbe?

- A:-Escherichia coli
- B:-Pseudomonas aeruginosa
- C:-Staphylococcus aureus
- D:-Salmonella typhi

Correct Answer:- Option-C

Question95:-Which of the following is an example of an enrichment medium used to enhance the growth of specific microbes?

- A:-Nutrient Agar
- B:-MacConkey Agar
- C:-Selenite F Broth
- D:-Eosin Methylene Blue (EMB) Agar

Correct Answer:- Option-C

Question 96:-Which of the following is a primary factor that differentiates lager beer

fermentation from ale beer fermentation?

A:-The type of yeast used and fermentation temperature

B:-The sugar content of the malt used

C:-The pH of the fermentation medium

D:-The amount of hops used in the fermentation process

Correct Answer:- Option-A

Question 97:-What is the primary function of hops in beer production?

A:-To ferment malt sugars into ethanol

B:-To enhance the aroma and add bitterness, balancing the sweetness of the malt

C:-To prevent the growth of Saccharomyces cerevisiae

D:-To increase the yeast's ethanol tolerance

Correct Answer:- Option-B

Question 98:-Which among the following statements about SEM (Scanning electron microscope) is correct?

A:-SEM provides a three-dimensional view of the surface structures of microorganisms

B:-SEM directly observes the internal structures of microorganisms without preparation

C:-SEM uses visible light to achieve high-resolution imaging

D:-SEM requires no fixation or dehydration of samples before imaging

Correct Answer: - Option-A

Question99:-Which of the following bacteria uses light energy and organic compounds as a carbon source ?

A:-Chemoheterotrophs

**B:-Chemoautotrophs** 

C:-Photoheterotrophs

D:-Photoautotrophs

Correct Answer:- Option-C

Question100:-Which of the following is a primary component of endotoxins found in the outer membrane of Gram-negative bacteria?

A:-Lipid A

B:-Peptidoglycan

C:-Lipoteichoic acid

D:-Protein A

Correct Answer:- Option-A