PROVISIONAL ANSWER KEY

137/2025/OL

Question

A:-4

Paper Code: Category 348/2024 Code: Exam: Assistant Tester Cum Gauger Date of Test 13-11-2025 Department Malabar Cements Limited Question1:-Which of the following is an amorphous substance? A:-Rubber B:-KCI C:-NaCl D:-Quartz Correct Answer:- Option-A Question2:-Ice is an example of A:-Covalent solid B:-Ionic solid C:-Molecular solid D:-Metallic solid Correct Answer:- Option-C Question3:-Which of the following statements about crystalline solids is/are correct? i. They are anisotropic in nature ii. They do not have sharp melting point iii. They have short range order A:-Only (i) B:-Only (ii) C:-Only (iii) D:-Both (ii) and (iii) Correct Answer:- Option-A Question4:-Number of atoms per body-centred cubit unit cell is: A:-1 B:-2 C:-3 D:-4 Correct Answer:- Option-B Question5:-Coordination number in cubic close packed structure is:

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B:-6
     C:-8
     D:-12
     Correct Answer:- Option-D
Question6:-Which of the following solids has sharp melting point?
     A:-Glass
     B:-Sodium chloride
     C:-Rubber
     D:-Plastics
     Correct Answer:- Option-B
Question7:-An ionic compound is formed by two elements A and B in which B^- make
ccp and A^+ occupy all the octahedral voids. Formula of the compound is
     A:-AB
     B:-AB_2
     C:-A_2B
     D:-A_2B_3
     Correct Answer:- Option-A
Question8:-If the radius ratio lies between 0.414 to 0.732, coordination number will
be:
     A:-4
     B:-6
     C:-8
     D:-10
     Correct Answer:- Option-B
Question9:-Packing efficiency in hexagonal close packing is
     A:-91
     B:-74
     C:-68
     D:-52.4
     Correct Answer:- Option-B
Question 10:- Which of the following is/are correct?
(i) In NaCl, the , Na^+ ions occupy all the tetrahedral voids
(ii) In ZnS, Zn^{2+} ions occupy all the tetrahedral voids
(iii) In CsCl, each Cs^+ ion is surrounded by eight Cl^- ions.
     A:-Only (i)
     B:-Only (ii)
     C:-Only (iii)
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D:-Both (i) and (ii)
     Correct Answer:- Option-C
Question11:-Which of the following is a secondary air pollutant?
     A:-Carbon monoxide
     B:-Sulphur dioxide
     C:-Ozone
     D:-NO
     Correct Answer:- Option-C
Question12:-Which of the following is not a unit used to express the concentration
of air pollutants?
     A:-ppm
     B:-\mu g/m^3
     C:-mg/L
     D:-None of the above
     Correct Answer:- Option-C
Question13:-Select the statement which help to control air pollution:
(i) Use natural gas
(ii) Arrange awareness programme against air pollution
(iii) Plant more trees
     A:-(i) and (ii)
     B:-(ii) and (iii)
     C:-(i) and (iii)
     D:-All the above
     Correct Answer:- Option-D
Question14:-Which is the most important human-controlled green house gas?
     A:-CFC
     B:-CH4
     C:-CO2
     D:-CO
     Correct Answer:- Option-C
Question15:-Select correct instrumental methods used for monitoring air pollutants:
i. Photometry
ii. IR spectroscopy
iii. Laser Technique
iv. Fluoriometry
     A:-All are correct
     B:-(i) and (ii)
     C:-(ii) and (iii)
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D:-	-(iii) and (iv)
Co	rrect Answer:- Option-A
Questio	n16:-Which metal is responsible for Minamata disease?
A:-	Pb
B:-	·Cd
C:-	·Hg
D:-	-Sn
Co	rrect Answer:- Option-C
Questio	n17:-Which disease is caused by the excessive use of nitrite fertilizers?
A:-	Meniere's disease
B:-	Blue baby syndrome
C:-	Itai-Itai disease
D:-	-Silicosis
Co	rrect Answer:- Option-B
(i) Low E (ii) Low (iii) High	n18:-Choose the correct statements: BOD value is an indication of water pollution COD value is an indication of water pollution n BOD value is an indication of water pollution n COD value is an indication of water pollution
A:-	(i) and (ii)
B:-	·(ii) and (iii)
C:-	·(iii) and (iv)
D:-	-(i) and (iv)
Co	rrect Answer:- Option-C
	n19:-The presence of heavy metals like lead and cadmium in soil is mainly
A:-	Acid rain
B:-	Industrial waster disposal
C:-	Natural weathering of rocks
D:-	-Use of compost
Co	rrect Answer:- Option-B
Questio	n20:-Chemically, DDT is classified as
A:-	Organophosphate insecticide
B:-	Carbamate insecticide
C:-	Chlorinated hydrocarbon insecticide
D:-	-Miscellaneous insecticide
Co	rrect Answer:- Option-C

Question21:-Classify the following solvents Column I Column II		
(i) Carbontetra chloride (a) Basic solvent (ii) Methyl alcohol (b) Aprotic solvent (iii) Liquid ammonia (c) Acidic solvent (iv) Acetic acid (d) Amphoteric solvent		
A:-(i)-(b), (ii)-(d), (iii)-(a), (iv)-(c)		
B:-(i)-(a), (ii)-(b), (iii)-(c), (iv)-(d)		
C:-(i)-(b), (ii)-(a), (iii)-(d), (iv)-(c)		
D:-(i)-(d), (ii)-(b), (iii)-(a), (iv)-(c)		
Correct Answer:- Option-A		
Question22:-The ratio of heat of vaporisation (J) to the boiling point (k) of a liquid is known as:		
A:-Critical constant		
B:-Hill constant		
C:-Trouton constant		
D:-Neel's constant		
Correct Answer:- Option-C		
Question23:-Which among the following statements are correct: (i) The dielectric constant of liquid ammonia is smaller than that of water (ii) The freezing and boiling points of liquid ammonia are higher than that of water (iii) NH_4Cl may be regarded as a strong acid in liquid ammonia (iv) Hydrochloric acid dissolves in liquid ammonia giving NH_4^+, NH_2^- and Cl ions		
A:-(i), (ii)		
B:-(ii), (iii)		
C:-(i), (iii)		
D:-(i), (iv)		
Correct Answer:- Option-C		
Question24:- so_3 when dissolved in liquid ammonia forms ammoniates. There ammoniates are $(so_3:NH_3)$		
A:-1:1 adduct		
B:-1: 3 adduct		
C:-2:1 adduct		
D:-1: 2 adduct		
Correct Answer:- Option-D		
Question25:-Alkali metals in liquid ammonia are		
A:-Oxidising agents		
B:-Reducing agents		

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Correct Answer:- Option-B
Question26:-Which among the following is a super acid?
     A:-HF
     B:-HClO4
     C:-HSO_3F
     D:-HSO<sub>3</sub>F.SbF<sub>5</sub>
     Correct Answer:- Option-D
Question27:-The auto ionisation product of N2O4 is
     A:-NO^2+and NO_3
     B:-NO^- and NO_3^+
     C:-NO^+and NO_3^-
     D:-NO^{2-} and NO_{3}^{2+}
     Correct Answer:- Option-C
Question 28:-NOCi behaves as _____ in N_2O_4 solvent.
     A:-Acid
     B:-Base
     C:-Neutral
     D:-None of the above
     Correct Answer:- Option-A
Question29:-What are the products formed when HNO_3 is treated with HF?
     A:-HNO_3^+ and F^-
     B:-H_2NO_3^+ and F^-
     C:-H_3No_3^+ and F^-
     D:-H_2NO_2^+ and F^-
     Correct Answer:- Option-B
Question 30:-Any compound which makes available so_3^- ions in liquid so_3 will acts as
     A:-Non Polar
     B:-Acids
     C:-Bases
     D:-None of these
     Correct Answer:- Option-C
Question31:-The number of significant figures present in 0.0304 is
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C:-Poor conductors

D:-None of these

- A:-2
- B:-3
- C:-4
- D:-5

Correct Answer:- Option-B

Question32:-0.002856 rounded to three significant figure is:

- A:-0.00285
- B:-0.002
- C:-0.00286
- D:-0.003

Correct Answer:- Option-C

Question33:-The numerical difference between measured value and absolute value of an analytical determination is:

- A:-Precision
- B:-Standard deviation
- C:-Error
- D:-Average deviation

Correct Answer:- Option-C

Question34:-Error in the ejudgement of colourof solution at the end point in titration is

- A:-Personal error
- B:-Method error
- C:-Constant error
- D:-All of the above

Correct Answer:- Option-A

Question35:-Which of the following reduce random error most effectively?

- A:-Changing the method
- B:-Changing the instrument used for measurement
- C:-Repeated measurement and averaging
- D:-Reduce the volume of the compound

Correct Answer:- Option-C

Question36:-Which of the following statement about standard deviation is incorrect?

- A:-Standard deviation can be negative
- B:-Standard deviation is square root of variance
- C:-Standard deviation is measure of precision
- D:-All of the above

Correct Answer:- Option-A Question37:-The number of significant figures present in 0.003290 A:-3 B:-4 C:-5 D:-6 Correct Answer:- Option-B Question38:-Which of the following is not included in the classification of error? A:-Systematic error B:-Value error C:-Random error D:-All of the above Correct Answer:- Option-B Question39:-Which of the following error is accidental error? A:-Indeterminate error B:-Determinate error C:-Proportional error D:-None of the above Correct Answer:- Option-A Question 40:- A sample of hematite was analysed by eleven students. The value obtained for the percentage of iron were as follows: 12.62, 12.73, 12.75, 12.78, 12.79, 12.83, 12.84, 12.87, 12.87, 12.92 and 12.94. The median value is:

A:-12.94 B:-12.78 C:-12.83 D:-12.84

Correct Answer:- Option-C

Question41:-Which one of the following is a wrong statement regarding gravimetry?

- (1) Digestion reduces the extent of co-precipitation and decrease size of crystals of precipitates which facilitates the filtration.
- (2) The low solubility of precipitates is achieved by the excess of precipitating agent.
- (3) By decreasing the temperature of the solution, solubility of precipitates will be decreased.
- (4) Precipitating agent should be mixed slowly and with constant agitation, which keep degree of supersaturation high and thus it will help in formation of crystalline precipitates.
- (5) The extent of contamination by post precipitation is much lower than coprecipitation.

A:-(1), (2) and (4) are wrong

B:-(1), (3) and (5) are wrong

C:-(1), (4) and (5) are wrong

D:-(1), (3) and (4) are wrong

Correct Answer:- Option-C

Question42:-Which of the following is the best reagent, added to the given lead acetate solution, for the gravimetric estimation of Lead?

A:-Potassium thiocyanate

B:-Potassium sulphate

C:-Potassium chromate

D:-Potassium dichromate

Correct Answer:- Option-C

Question43:-In gravimetric estimation of iron as iron oxide, after precipitating iron as iron hydroxide, the precipitate is made free from chloride ions by washing with

A:-One percent ammonium nitrite solution

B:-One percent ammonium nitrate solution

C:-One percent ammonium hydroxide solution

D:-One percent sodium nitrate solution

Correct Answer:- Option-B

Question44:-The gravimetric technique used to separate and analyze the ions in a substance like a metal is

A:-Metallogravimetry

B:-Electrogravimetry

C:-Voltagravimetry

D:-Colombgravimetry

Correct Answer:- Option-B

Question45:-The ashless filter paper used, in the gravimetric estimation of sulphate as barium sulphate, for the decantation of the clear solution of the precipitated

barium sulphate is

A:-Whatman No. 540

B:-Whatman No. 541

C:-Whatman No. 545

D:-Whatman No. 542

Correct Answer:- Option-A

Question46:-For the gravimetric estimation of nickel, which one of the following is correct?

A:-Precipitating reagent is 8-Hydroxyquinoline and sintered crucible is used for filtration

B:-Precipitating reagent is Dimethylglyoxime and the pH is buffered in the range of 5 to 9

C:-Precipitating reagent is 8-Hydroxyquinoline and silica crucible is used

D:-Precipitating reagent is Dimethyl glyoxime and the reaction solution contains acetic acid

Correct Answer:- Option-B

Question47:-The crucible used for filtration of the precipitate obtained during the gravimetric estimation of silver as silver chloride is

A:-Silica Crucible

B:-Sintered Glass Crucible

C:-Nickel crucible

D:-Porcelain crucible

Correct Answer:- Option-B

Question48:-In the gravimetric estimation procedure of copper as cuprous thiocyanate, the role of sulphurous acid is

A:-Oxidising Agent

B:-Suppressing Agent

C:-Antiocoagulating Agent

D:-Reducing Agent

Correct Answer: - Option-D

Question49:-In the gravimetric estimation, on digestion, precipitates tends to become:

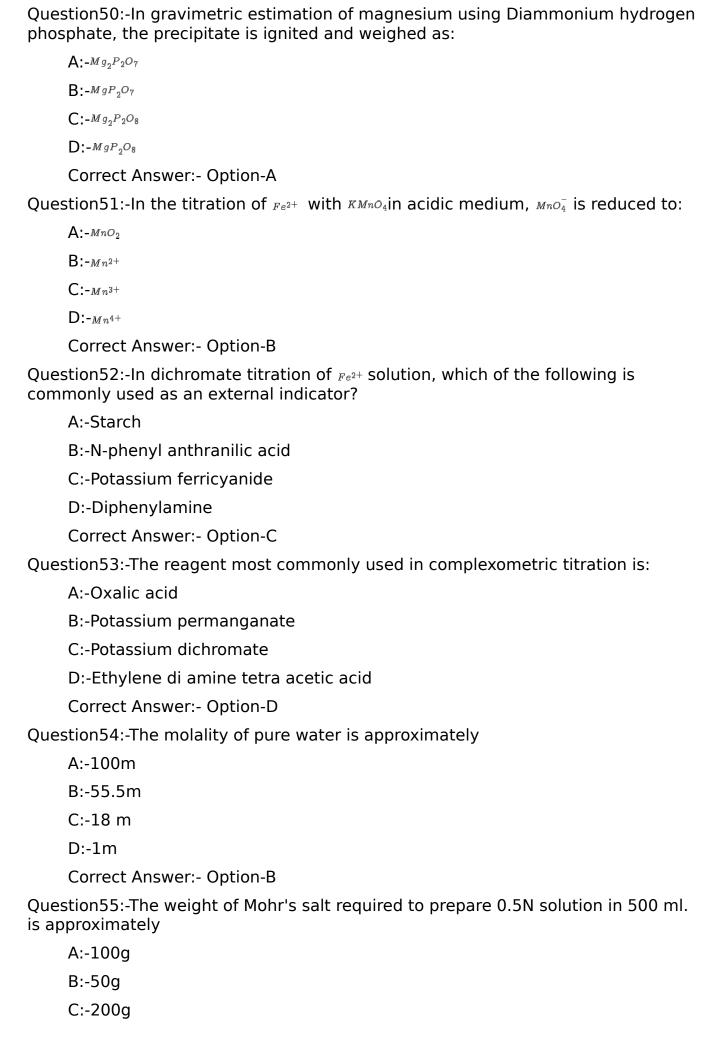
A:-More regular and collodial

B:-Dense and increase in surface adsorption

C:-Crystalline particle and decrease in surface area

D:-Increase size of crystals of precipitates

Correct Answer:- Option-D



D:-400g

Correct Answer: - Option-A

Question 56:- Which of the following substance is suitable as a primary standard?

A:-Potassium permanganate

B:-Potassium dichromate

C:-Sodium hydroxide

D:-Crsytalline copper sulphate

Correct Answer:- Option-B

Question57:-Which of the following concentration term is temperature independent?

A:-Normality

B:-Molarity

C:-Molality

D:-Formality

Correct Answer:- Option-C

Question58:-In acid-base titration, the colour change of phenolphthalein occurs between pH:

A:-3.1 - 4.4

B:-4.2 - 6.3

C:-6.8 - 8.4

D:-8.3 - 10.0

Correct Answer:- Option-D

Question59:-In an acid-base tirtration, if 20 ml of 0.1 N NaOH neutralizes 40 ml of acid solution, the normality of HCl is:

A:-0.25 N

B:-0.2 N

C:-0.1 N

D:-0.05 N

Correct Answer: - Option-D

Question60:-In the titration of $\mathbb{Z}^{n^{2+}}$ ions with EDTA using Eriochrome Black T as an indicator, the colour change at the end point is

A:-Red to Blue

B:-Blue to Red

C:-Green to Violet

D:-Pink to colourless

Correct Answer:- Option-A

Question61:-Which is the correct increasing order of percentage of oxides present

in Portland cement?

 $A:-Al_2O_3 > CaO > SiO_2$

 $B:-Al_2O_3 > SiO_2 > CaO$

 $C:-SiO_2 > CaO > Al_2O_3$

 $\mathsf{D:-}\mathit{CaO} > \mathit{SiO}_2 {>} \mathit{Al}_2 O_3$

Correct Answer:- Option-D

Question62:-A slow setting cement contains:

A:-Excess of silica

B:-Lower amount of silica

C:-Excess of Alumina

D:-Excess of lime

Correct Answer: - Option-A

Question63:-Maximum permissible limit of magnesia in cement, used for railway sleepers, in 53-S Grade cement is:

A:-5%

B:-6%

C:-10%

D:-8%

Correct Answer:- Option-A

Question64:-Which one of the following ingredients in not a content in Portland Cement?

A:-Dicalcium Silicate (Ca₂SiO₄)

B:-Tricalcium Phosphate $\left[Ca_3(PO_4)_2\right]$

C:-Tricalcium Silicate [Ca₃SiO₅]

D:-Tricalcium aluminate $\begin{bmatrix} Ca_3Al_2O_6 \end{bmatrix}$

Correct Answer:- Option-B

Question65:-Consider the following Statement:

- 1) Setting of cement is an endothermic process
- 2) Setting of cement involves hydration and rearrangement of molecules of calcium aluminates and calcium silicates

A:-Both (1) and (2) are correct and (2) is the correct explanation of (1)

B:-Both (1) and (2) are correct and (2) is not correct explanation of (1)

C:-(1) is correct, (2) is wrong

D:-(1) is wrong, (2) is correct

Correct Answer:- Option-D

Question66:-Ordinary Portland Cement Grade 33 means:

A:-Soundness of cement is 0.33 mm

B:-Compressive strength of cement is 33 MPa

C:-Setting time of cement is 33 minutes

D:-Fineness of cement is $\frac{33m^2}{kg}$

Correct Answer:- Option-B

Question67:-For a good quality cement the ratio of Silica (SiO_2) to alumina (Al_2O_3) should be between:

A:-2.5 and 4

B:-2 and 1

C:-3.5 and 4

D:-2 and 2.5

Correct Answer:- Option-A

Question68:-To determine compressive strength of cement, How much water is to be added in mortar as a percentage of total mass of cement and sand, where P stands for the water required for standard consistency?

A:-0.85P

 $B:-\frac{P}{3}+4$

 $C:-\frac{P}{4}+3$

D:-0.28P

Correct Answer:- Option-C

Question69:-Initial setting time for ordinary portland cement and IRS_T_40 Cement respectively are:

A:-30 minute and 10 hours

B:-30 minute and one hour

C:-One hour and 10 hours

D:-One hour and 1.5 hours

Correct Answer:- Option-B

Question 70: Find the correct match for tests on cement and apparatus or method used:

A:-Tensile Strength test - Sieve method

B:-Final setting time test - Universal Testing Machine (UTM)

C:-Soundness test - Le-Chatelier's apparatus

D:-Compressive Strength Test - Air Permeability Test

Correct Answer:- Option-C

Question71:-Cement clinker is mixed with 2-3% by weight of which substance to slow down the process of setting?

 $A:-CaSO_4\cdot\frac{1}{2}H_2O$

B:-Ca3Si04

C:-CaSO4.2H2O

D:-Ca3(PO4)2

Correct Answer:- Option-C

Question72:-The fineness and strength of the cement are:

A:-Randomly related

B:-Inversely proportional

C:-Not related

D:-Directly proportional

Correct Answer:- Option-D

Question73:-Raw materials used for High alumina cement is

A:-Limestone and clay

B:-Limestone and Bauxite

C:-Clay and Bauxite

D:-Magnesium Phosphate and alumina

Correct Answer:- Option-B

Question74:-Vicat apparatus is used for

A:-Fineness test

B:-Soundness test

C:-Consistency test

D:-None of the above

Correct Answer:- Option-C

Question75:-Which are the correct statements?

- (i) Portland Pozzolana cement produces less heat of hydration.
- (ii) Extra rapid hardening cement is obtained by integrating calcium chloride with rapid hardening Portland Cement.
- (iii) Sulphate resisting cement contains high amount of tricalcium aluminate.
- (iv) Expansive cement suffers no over change in volume on drying.

A:-(i), (ii), (iii), (iv)

B:-(i), (iii) and (iv) only

C:-(i), (ii) and (iv) only

D:-(i), (ii) and (iii) only

Correct Answer:- Option-C

Question 76:-During wet process of production of cement which is not used as fuel for burning?

A:-Natural gas

B:-Powdered coal

C:-Oil

D:-Wood

Correct Answer: - Option-D

Question77:-Cement used for mass concreting is:

A:-Low heat cement

B:-Sulphate Resisting Cement

C:-Rapid hardening cement

D:-Portland slag cement

Correct Answer:- Option-A

Question 78: During the field test for the quality of cement, a hand full of cement taken and thrown to a bucket full of water. A good quality cement will:

A:-Completely sink to the bottom of the bucket

B:-Suddenly dissolve in the water

C:-Produces large heat and water produces steam

D:-Particles float for sometime before they sink

Correct Answer:- Option-D

Question79:-Rediset cement can be used for:

(i) Mass concrete

(ii) Patch repairs and emergency repair

(iii) Construction between tides

(iv) As sulphate resistant

A:-(i) and (ii) are correct

B:-(ii) and (iii) are correct

C:-(i) and (iii) are correct

D:-(iii) and (iv) are correct

Correct Answer:- Option-B

Question80:-Advantage of Portland Possolana Portland cement over ordinary Portland cement is due to:

A:-PPC does not produce calcium hydroxide as much as that of OPC

B:-PPC has low heat of hydration

C:-Long term strength of PPC is higher than OPC

D:-All the above

Correct Answer:- Option-D

Question81:-When no heat energy is allowed to enter or leave the system, the process is called;

A:-Isochoric

B:-Isothermal

C:-Adiabatic

D:-Isobaric

Correct Answer:- Option-C

Question82:-Among the following which one is extensive property?

A:-Volume

B:-Surface tension

C:-Temperature

D:-pH

Correct Answer:- Option-A

Question83:-A system absorbs 400 J of heat and does work equivalent to 300 J on its surroundings. The change in internal energy is:

A:-300 J

B:-100 |

C:-400 J

D:-700 J

Correct Answer:- Option-B

Question84:-Which one of the following is not a state function?

A:-enthalpy

B:-entropy

C:-temperature

D:-heat

Correct Answer:- Option-D

Question85:-The heat required to raise the temperature of a body by 1ºC is called:

A:-Specific heat capacity

B:-Heat capacity

C:-Cp

D:-C_v

Correct Answer:- Option-B

Question86:-The process of evaporation of a liquid is accompanied by

A:-decrease in entropy

B:-no charge in entropy

C:-increase in entropy

D:-no change in free energy

Correct Answer:- Option-C

Question87:-The correct relationship between free energy change in a reaction and the corresponding equilibrium constant K_c is:

$$A:-\Delta G = RTl_nK_c$$

$$B:-\Delta G^{\circ} = RTl_nK_c$$

$$C:-\Delta G = RTl_nK_c$$

$$D:-\Delta G^{\circ} = RTl_n K_c$$

Correct Answer:- Option-D

Question88:-Among the following which one is not a spontaneous process?

A:-Electrolysis of water

B:-Dissolution of ammonium chloride in water

C:-Combustion of fuel

D:-Neutralisation reaction between acid and a base

Correct Answer: - Option-A

Question89:-For a reaction to be spontaneous at all temperature:

A:- ΔG and ΔH should be negative

B:-ΔG for the reaction is zero

C:- ΔG and ΔH should be positive

D:-ΔH for the reaction is zero

Correct Answer: - Option-A

Question 90:-What is the enthalpy change for the allotropic transformation from monoclinic sulphur to rhombic sulphur, given that

$$S_{(r\,\mathrm{hom}\,bic)} + O_{2(g)} \to SO_{2(g)}; \Delta\,H = ^-295.1\,kJ$$

$$S_{(monoclonic)} + O_{2(g)} \rightarrow SO_{2(g)}; \Delta H = ^-296.4 kJ$$

A:--1.3k

B:-1.3 kJ

C:-zero

D:-None of these

Correct Answer:- Option-A

Question91:-During corrossion metal gets

A:-reduced

B:-oxidised

C:-No change

D:-None of these

Correct Answer:- Option-B

Question 92:-During rusting of Iron, at cathodic sport oxygen gets reduced to water. $_{H^+}$ for this reaction is obtained from

A:-H₂CO₃

B:-HCl

 $C:-HNO_3$

 $D:-H_2S$

Correct Answer:- Option-A

Question93:-Galvanisation is the process in which iron surface is coated with A:-Copper B:-Magnesium C:-Zinc D:-Aluminium Correct Answer:- Option-C Question 94: Tarnishing of silver is an example for corrossion in which silver gets converted to its A:-Oxide B:-Carbonate C:-Hydroxide D:-Sulphide Correct Answer:- Option-D Question95:-Among the following which metal cannot be used for sacrificial protection of Iron? A:-Copper B:-Magnesium C:-Zinc D:-Aluminium Correct Answer: - Option-A Question 96:-Which among the following is not a Barrier protection method for preventing corrosion of a metal? A:-Painting B:-Applying oil C:-Applying Bis phenol D:-Connecting the metal to a more active metal Correct Answer:- Option-D Question 97:- What is the effect of electrolyte on the rate of corrossion? A:-decrease the rate of corrosion B:-increase the rate of corrosion C:-No effect on the rate of corrosion D:-Can increase or decrease the rate of corrosion Correct Answer:- Option-B Question 98:-Which of the following statement regarding corrosion is false? A:-Corrossion of iron is not an electro chemical process B:-Corrossion of Iron in sea water is faster than in ordinary water

C:-Painting Iron article helps in preventing corrossion

D:-Iron does not rust in dry air or vaccum

Correct Answer:- Option-A

Question99:-Chemical formula of rust is:

A:-FeCl₃

B:-FeSO4

C:- $Fe_2O_3 \times H_2O$

D:-FeO

Correct Answer:- Option-C

Question100:-Among the following which metal gets easily corroded?

A:-Copper

B:-Magnesium

C:-Silver

D:-Gold

Correct Answer:- Option-B