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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

प्रश्नपुस्तिका सीरीज
Question Booklet Series
B

B.Sc.-Part-I (Second Semester) Examination, July-2022

B190201T

Industrial Chemistry

(Material Science and Techniques in Chemical Industries)

Time : 1:30 Hours **Maximum Marks-100**

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

निर्देश : –

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET) में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा किसी प्रश्न का एक से अधिक उत्तर दिया जाता है, तो उसे गलत उत्तर माना जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी ओ०एम०आर० शीट उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

K-264

1. Adsorption due to weak Vander Waals force is called :

(A) Pseudo Adsorption

(B) Desorption

(C) Physisorption

(D) Chemisorption

2. The amount of gas adsorbed on a solid surface :

(A) Independent on temperature

(B) Increases with decreases temperature

(C) Increases with increasing temperature

(D) None

3. The incorrect statement for ceramics :

(A) Hard, strong & dence

(B) Weak in impact strength

(C) Poor dielectric properties

(D) Above all

4. Which one of the followings are not a ceramic materials ?

(A) $Al_2 O_3$

(B) SiC

(C) SiO_2

(D) $Si_2 N_4$

5. The bonding in ceramics is :

(A) Ionic

(B) Covalent

(C) Ionic & covalent both

(D) Metallic

6. The ceramic materials is:

(A) Mica

(B) ZnS

(C) Copper

(D) ZnO

7. The ceramic materials are :

(A) Brittle in nature

(B) Inorganic materials

(C) Good thermal insulators

(D) All of above

8. Alumina is a _____.

(A) Conductor

(B) Ceramic

(C) Semiconductor

(D) Dielectric

9. Porcelain is a type of _____ ceramic.

(A) White ware

(B) Stone

(C) Abrasive

(D) Cement

10. Which of the following is not a step in making ceramics ?

(A) Alloying

(B) Vitrification

(C) Powder pressing

(D) Sintering

11. An Azeotrope occurs, when there is same _____.

(A) Boiling point

(B) Melting point

(C) VLE composition

(D) Equilibrium pressure

12. An example of minimum azeotrope is :

(A) Benzene-water

(B) Benzene-Alcohol

(C) Ethanol-water

(D) All

13. Steam distillation process is used to separate substances which are _____.

(A) Steam volatile

(B) Steam volatile & immisible with water

(C) Steam volatile & misible with water

(D) All

14. Fractional distillation is a process of separation of _____.

(A) 2 immisible liquid

(B) 2 misible liquid

(C) Liquid & solid

(D) Solid & gas

15. The process in which solid is directly converted to vapours state is called.

(A) Sublimation

(B) Crystallization

(C) Filtration

(D) Distillation

16. Which of the following is crystallization ?

(A) Solid-Solid separation

(B) Solid- liquid separation

(C) Solid-gas separation

(D) Liquid-gas separation

17. What is the purpose of recrystallization ?

(A) To purify products

(B) To dissolve products

(C) To clean products

(D) To separate-out

18. Which of the following does not influence filtration ?

(A) Viscosity

(B) pH

(C) Density

(D) Temperature

19. Which of the following process is used to separate insoluble particles from liquids ?

(A) Filtration

(B) Extraction

(C) Drying

(D) Fractional crystallization

20. At What speed do you centrifuge blood ?

(A) 220-250 RPM

(B) 2200-2500 RPM

(C) 1000-1500 RPM

(D) 4000 RPM

21. Solvent extraction is a _____ analytical technique.

(A) Identification

(B) Qualitative

(C) Quantitative separation

(D) None

22. Solvent extraction is governed by _____ law.

(A) Lambert Beer's law

(B) Ostwald's law

(C) Rault's law

(D) Nernst distribution law

23. Which one will change from red litmus to blue ?

(A) NaCl

(B) KOH

(C) Glucose

(D) HCl

24. The additional operation requires for drying gas and liquid is _____.

(A) Humidification

(B) Dehumidification

(C) Adsorption

(D) Absorption

25. The moisture inside the substance is known as _____.

(A) Free moisture

(B) Unbound moisture

(C) Bound moisture

(D) Equilibrium moisture

26. After critical moisture content _____ tarts.

(A) Saturated drying Region

(B) Unsaturated drying Region

(C) Constant drying Region

(D) None

27. Which one of these drying techniques is used for drying antibiotics & plant extract?

(A) Vacuum dryer

(B) Freeze dryer

(C) Spray dryer

(D) None of these

28. In which dryer, hot air jets are used for drying purposes ?

(A) Vacuum dryer

(B) Spray dryer

(C) Roller dryer

(D) Fluid bed dryer

29. Drying involves _____ transfer operation.

(A) Mass

(B) Heat

(C) Mass & Heat

(D) None

30. For effective drying conditions which processing factor is essential.

(A) Height

(B) Weight

(C) Pressure

(D) Humidity

31. Which of the following condition is correct for evaporation ?

(A) Solvent must be volatile

(B) Non volatile solvent

(C) Viscous liquid

(D) Constituent must be thermolabile

32. Which factor does not influence the rate of evaporation ?

(A) Melting points of solid

(B) Vapour pressure difference

(C) Viscosity of the solution

(D) Surface area

33. What is the source of heat in most of the evaporators ?

(A) Coal

(B) Hot water

(C) Steam

(D) Oil bath

34. Distillation operation involves on of the following steps.

(A) Vaporization

(B) Vaporization & condensation

(C) Crystallization

(D) Drying

35. Which part of the distillation apparatus represents the heat exchanger ?

(A) Adapter

(B) Condenser

(C) Receiver

(D) Still

36. X-rays can be deflected by :

(A) Flection field

(B) Magnetic field

(C) Electromagnetic field

(D) None of them

37. X-ray crystallography is not used to find the physical properties of _____.

(A) Liquid

(B) Solid

(C) Metal

(D) Metal complex

38. In power method, the powder sample is contained in which of the following.

(A) Thin walled test tube

(B) Thin walled flask

(C) Thin walled glass capillary tubes

(D) Currettes

39. The equation used in x-ray powder diffraction :

(A) Bragg's equation

(B) Debye equation

(C) Einstein equation

(D) Nernst equation

40. As the applied voltage increases, the minimum wavelength of x-radiation from a metal.

(A) Variable with metal

(B) Increases

(C) Decreases

(D) Remain same

41. Which of the following boiler is best suited to meet the fluctuating demand of steam ?

(A) Wilcox boiler

(B) Cornish boiler

(C) Lanchashire boiler

(D) Locomotive boiler

42. An economizer in a boiler _____.

(A) Increases steam pressure

(B) Increases steam flow

(C) Decreases fuel consumption

(D) Decreases steam pressure

43. Green coal, In order to be burnt must be :

(A) Heated sufficiently

(B) Burnt in excess air

(C) Heated to the ignition point

(D) Burnt as powder

44. A wet vapour can be completely specified by :

(A) Temperature only

(B) Pressure only

(C) Dryness fraction

(D) Pressure & Dryness fraction

45. When is super saturation attained ?

(A) Solvent contains more solute

(B) Solute contains more solvent

(C) Solvent contains less solute

(D) Solute contains less solvent

46. What are crystallization techniques ?

(A) Sharp cooling

(B) Diffusion

(C) Gradual cooling

(D) Gradual cooling & Diffusion

47. What is the main feature of circulating liquid crystallizer ?

(A) Efficiency is high

(B) Super saturation is created in a separate region

(C) Low capital cost

(D) Easy maintenance

48. The parameter used ASME to define fans, blowers and compressors is :

(A) Fan ratio

(B) Blade ratio

(C) Specific ratio

(D) Twist factor

49. Compressor is used to _____ the pressure of a fluid.

(A) Increases

(B) Decreases

(C) Remains same

(D) Can't say

50. Pressure of which of the following substances can you increase by pump ?

(A) Solid

(B) Gas

(C) Liquid

(D) Above all

51. One Nanometer is equal to _____.

(A) 10^{-6} m

(B) 10^{-9} m

(C) 10^{-12} m

(D) 10^{-15} m

52. One Picometer is equal to _____.

(A) 10^{-3} m

(B) 10^{-6} m

(C) 10^{-12} m

(D) 10^{-9} m

53. Nano scale Aluminium oxide increases the_____.

(A) Conductivity

(B) Resistance

(C) Ductility

(D) Stability

54. Nanomaterials synthesized by sol-gel technique results in a foam like structure is called :

(A) Gel

(B) Arogel

(C) Asosol

(D) Foam

55. Quantum dat can be used in :

(A) Quantum physics

(B) Quantum mechanics

(C) Opto electronics

(D) Above all

56. The dimension of nanomaterials is less than _____.

(A) 1 nm

(B) 10 nm

(C) 100 nm

(D) 500 nm

57. The colour of nano gold particle is :

(A) Orange

(B) Yellow

(C) Red

(D) Above all

58. The first talk about nano technology was given by :

(A) Newton

(B) Einstein

(C) Bohr

(D) Richard Feynman

59. The most important property of nanomaterials is :

(A) Pressure

(B) Temperature

(C) Force

(D) Friction

60. Nano sine polymers built from branched units are called :

(A) Dendrimers

(B) Oligomers

(C) Composite

(D) Carbon materials

61. Toxicity of nanomaterials is not primarily dependent on :

(A) Surface charge

(B) Surface area

(C) Particle size

(D) Thermal conductivity

62. The absorption & adsorption of molecules are fast and high in _____ materials.

(A) Nanomaterials

(B) Metal complex

(C) Bulk materials

(D) None of them

63. The full form of SEM is :

(A) Scanning electron microscope

(B) Scanning electrode microscope

(C) Surface electrode materials

(D) Surface electron microscope

64. The nano structure are categorized into _____ Types according to their dimensions.

(A) One

(B) Two

(C) Three

(D) Four

65. _____ is used in cancer therapeutics.

(A) Carbon nanotubes

(B) Nano rods

(C) Nano bots

(D) All

66. _____ is used in solar cell

(A) Carbon nano tubes

(B) Nano rods

(C) Nano bots

(D) None

67. _____ is an organic nanoparticles :

(A) Carbon Nanotubes

(B) Gold

(C) Silica

(D) Zine oxide

68. The size and shape of silver for blue colour is around _____.

(A) 10 mm

(B) 40 mm

(C) 40 nm

(D) 100 Pm

69. _____ is the smallest buang ball cluster.

(A) C_6

(B) C_{10}

(C) C_{20}

(D) C_{40}

70. The fullerenes are made up with :

(A) Graphene sheets

(B) Graphite

(C) Lead

(D) Carbide

71. The naturally occurring element found in _____ is buckminister fullerenes.

(A) Earth

(B) Soot

(C) Smoke

(D) Fog

72. Fullerenes are allotropes of _____.

(A) Nitrogen

(B) Carbon

(C) Oxygen

(D) Phosphorous

73. Thin film of C_{60} are _____ colour.

(A) Blue

(B) Red

(C) Mustard

(D) Green

74. Spherical fullerenes are called_____.

(A) Bucky ball

(B) Duky ball

(C) Cricket ball

(D) Tennis ball

75. Which of the following are the properties of super conductors ?

(A) Diamagnetic nature

(B) Zero resistivity

(C) Infinite conductivity

(D) Above all

76. In super conductivity the conductivity of materials becomes :

(A) Zero

(B) Finite

(C) Infinite

(D) None of the above

77. The super conducting state is perfectly _____ in nature.

(A) Diamagnetic

(B) Paramagnetic

(C) Ferromagnetic

(D) Ferrimagnetic

78. Which of the following conductor has highest critical temperature ?

(A) Al

(B) Zn

(C) Mo

(D) Sn

79. The shifting of electrons in superconductors is prevented by _____.

(A) Quantum effect

(B) Orbitals

(C) Thresold energy

(D) Energy barrier

80. The normal metal passes into super conducting state at _____.

(A) High temperature

(B) Low temperature

(C) Critical temperature

(D) No temperature

81. The ideal superconductors exhibit _____.

(A) Meissner effect

(B) Mesmeric effect

(C) Mesomeric effect

(D) Monomeric effect

82. The electron pains in a superconductor are called _____.

(A) Bardeen pair

(B) Cooper pair

(C) Bes pair

(D) Josephson pair

83. A materials changes from normal to super conducting state below _____ temperature.

(A) Curve

(B) Critical

(C) Weiss

(D) None

84. The maximum current that can be passed through a super conductor is called :

(A) Supper current

(B) Optimum current

(C) Critical current

(D) None

85. Which of the following gel/ hydrogel is formed by a physical gelation mechanism ?

(A) Polyester gel

(B) Gelatin

(C) CMC-g-acrylic acid

(D) Poly dimethyl siloxane

86. Which type of materials are used as bridge between human tissues & metals ?

(A) Metallic biomaterials

(B) Polymeric biomaterials

(C) Ceramic

(D) All

87. Which one of the following is not a colloid ?

(A) Milk

(B) Mud

(C) Butter

(D) Baric acid

88. Which of the following is an aerosol ?

(A) Smoke

(B) Milk

(C) Cheese

(D) Butter

89. Which of the following will show Tyndall effect ?

(A) Soap solution below CMC

(B) Soap solution above CMC

(C) NaCl solution

(D) Glucose solution

90. Which of the following colloidal system represents a gel ?

(A) Solid in Gas

(B) Liquid in Gas

(C) Liquid in solid

(D) Solid in liquid

91. What is the colloidal solution of a gas in liquid called ?

(A) Aerosol

(B) Gel

(C) Foam

(D) Aerogel

92. The size of colloidal particles are in the range :

(A) 10-100 nm

(B) 10-100 Pm

(C) 1-100 μm

(D) 1-10 mm

93. Fog is an example of which type of colloidal system.

(A) Gas in liquid

(B) Liquid in gas

(C) Gas in gas

(D) Solid in gas

94. A colloidal solution consists of :

(A) A dispersed phase

(B) A dispersion medium

(C) A dispersed phase in a dispersion medium

(D) None

95. An emulsion is a colloidal solution of a _____ dispersed in another liquid.

(A) Solid

(B) Liquid

(C) Gas

(D) Medium

96. The cleansing action of soap is due to :

(A) Hydrolysis of soap

(B) Ionisation of soap

(C) High molar mass

(D) Emulsification properties of soap

97. The lyophilic sols are :

(A) Reversible in nature

(B) Irreversible in nature

(C) Both

(D) None

98. Blood is purified by :

(A) Dialysis

(B) Filtration

(C) Coagulation

(D) Electro-osmosis

99. Adsorption of gases on solid surface is exothermic because :

(A) Enthalpy is positive

(B) Entropy decreases

(C) Entropy increases

(D) Free energy increases

100. Adsorption theory explain _____ catalysis.

(A) Auto

(B) Enzyme

(C) Homogenous

(D) Heterogeneous

******

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