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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

प्रश्नपुस्तिका सीरीज
Question Booklet Series
C

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

(A) Solid

(B) Gas

(C) Liquid

(D) Above all

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

(A) Increases

(B) Decreases

(C) Remains same

(D) Can't say

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

(A) Fan ratio

(B) Blade ratio

(C) Specific ratio

(D) Twist factor

4. 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

5. What are crystallization techniques ?

(A) Sharp cooling

(B) Diffusion

(C) Gradual cooling

(D) Gradual cooling & Diffusion

6. 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

7. A wet vapour can be completely specified by :

(A) Temperature only

(B) Pressure only

(C) Dryness fraction

(D) Pressure & Dryness fraction

8. 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

9. An economizer in a boiler _____.

(A) Increases steam pressure

(B) Increases steam flow

(C) Decreases fuel consumption

(D) Decreases steam pressure

10. 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

11. 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

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

(A) Bragg's equation

(B) Debye equation

(C) Einstein equation

(D) Nernst equation

13. 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

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

(A) Liquid

(B) Solid

(C) Metal

(D) Metal complex

15. X-rays can be deflected by :

(A) Flection field

(B) Magnetic field

(C) Electromagnetic field

(D) None of them

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

(A) Adapter

(B) Condenser

(C) Receiver

(D) Still

17. Distillation operation involves on of the following steps.

(A) Vaporization

(B) Vaporization & condensation

(C) Crystallization

(D) Drying

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

(A) Coal

(B) Hot water

(C) Steam

(D) Oil bath

19. 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

20. 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

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

(A) Height

(B) Weight

(C) Pressure

(D) Humidity

22. Drying involves _____ transfer operation.

(A) Mass

(B) Heat

(C) Mass & Heat

(D) None

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

(A) Vacuum dryer

(B) Spray dryer

(C) Roller dryer

(D) Fluid bed dryer

24. 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

25. After critical moisture content _____ tarts.

(A) Saturated drying Region

(B) Unsaturated drying Region

(C) Constant drying Region

(D) None

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

(A) Free moisture

(B) Unbound moisture

(C) Bound moisture

(D) Equilibrium moisture

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

(A) Humidification

(B) Dehumidification

(C) Adsorption

(D) Absorption

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

(A) NaCl

(B) KOH

(C) Glucose

(D) HCl

29. Solvent extraction is governed by _____ law.

(A) Lambert Beer's law

(B) Ostwald's law

(C) Rault's law

(D) Nernst distribution law

30. Solvent extraction is a _____ analytical technique.

(A) Identification

(B) Qualitative

(C) Quantitative separation

(D) None

31. At What speed do you centrifuge blood ?

(A) 220-250 RPM

(B) 2200-2500 RPM

(C) 1000-1500 RPM

(D) 4000 RPM

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

(A) Filtration

(B) Extraction

(C) Drying

(D) Fractional crystallization

33. Which of the following does not influence filtration ?

(A) Viscosity

(B) pH

(C) Density

(D) Temperature

34. What is the purpose of recrystallization ?

(A) To purify products

(B) To dissolve products

(C) To clean products

(D) To separate-out

35. Which of the following is crystallization ?

(A) Solid-Solid separation

(B) Solid- liquid separation

(C) Solid-gas separation

(D) Liquid-gas separation

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

(A) Sublimation

(B) Crystallization

(C) Filtration

(D) Distillation

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

(A) 2 immisible liquid

(B) 2 misible liquid

(C) Liquid & solid

(D) Solid & gas

38. 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

39. An example of minimum azeotrope is :

(A) Benzene-water

(B) Benzene-Alcohol

(C) Ethanol-water

(D) All

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

(A) Boiling point

(B) Melting point

(C) VLE composition

(D) Equilibrium pressure

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

(A) Alloying

(B) Vitrification

(C) Powder pressing

(D) Sintering

42. Porcelain is a type of _____ ceramic.

(A) White ware

(B) Stone

(C) Abrasive

(D) Cement

43. Alumina is a _____.

(A) Conductor

(B) Ceramic

(C) Semiconductor

(D) Dielectric

44. The ceramic materials are :

(A) Brittle in nature

(B) Inorganic materials

(C) Good thermal insulators

(D) All of above

45. The ceramic materials is:

(A) Mica

(B) ZnS

(C) Copper

(D) ZnO

46. The bonding in ceramics is :

(A) Ionic

(B) Covalent

(C) Ionic & covalent both

(D) Metallic

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

(A) $Al_2 O_3$

(B) SiC

(C) SiO_2

(D) $Si_2 N_4$

48. The incorrect statement for ceramics :

(A) Hard, strong & dence

(B) Weak in impact strength

(C) Poor dielectric properties

(D) Above all

49. 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

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

(A) Pseudo Adsorption

(B) Desorption

(C) Physisorption

(D) Chemisorption

51. Adsorption theory explain _____ catalysis.

(A) Auto

(B) Enzyme

(C) Homogenous

(D) Heterogeneous

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

(A) Enthalpy is positive

(B) Entropy decreases

(C) Entropy increases

(D) Free energy increases

53. Blood is purified by :

(A) Dialysis

(B) Filtration

(C) Coagulation

(D) Electro-osmosis

54. The lyophilic sols are :

(A) Reversible in nature

(B) Irreversible in nature

(C) Both

(D) None

55. 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

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

(A) Solid

(B) Liquid

(C) Gas

(D) Medium

57. A colloidal solution consists of :

(A) A dispersed phase

(B) A dispersion medium

(C) A dispersed phase in a dispersion medium

(D) None

58. 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

59. 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

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

(A) Aerosol

(B) Gel

(C) Foam

(D) Aerogel

61. 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

62. Which of the following will show Tyndall effect ?

(A) Soap solution below CMC

(B) Soap solution above CMC

(C) NaCl solution

(D) Glucose solution

63. Which of the following is an aerosol ?

(A) Smoke

(B) Milk

(C) Cheese

(D) Butter

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

(A) Milk

(B) Mud

(C) Butter

(D) Baric acid

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

(A) Metallic biomaterials

(B) Polymeric biomaterials

(C) Ceramic

(D) All

66. 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

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

(A) Supper current

(B) Optimum current

(C) Critical current

(D) None

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

(A) Curve

(B) Critical

(C) Weiss

(D) None

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

(A) Bardeen pair

(B) Cooper pair

(C) Bes pair

(D) Josephson pair

70. The ideal superconductors exhibit _____.

(A) Meissner effect

(B) Mesmeric effect

(C) Mesomeric effect

(D) Monomeric effect

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

(A) High temperature

(B) Low temperature

(C) Critical temperature

(D) No temperature

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

(A) Quantum effect

(B) Orbitals

(C) Thresold energy

(D) Energy barrier

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

(A) Al

(B) Zn

(C) Mo

(D) Sn

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

(A) Diamagnetic

(B) Paramagnetic

(C) Ferromagnetic

(D) Ferrimagnetic

75. In super conductivity the conductivity of materials becomes :

(A) Zero

(B) Finite

(C) Infinite

(D) None of the above

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

(A) Diamagnetic nature

(B) Zero resistivity

(C) Infinite conductivity

(D) Above all

77. Spherical fullerenes are called_____.

(A) Bucky ball

(B) Duky ball

(C) Cricket ball

(D) Tennis ball

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

(A) Blue

(B) Red

(C) Mustard

(D) Green

79. Fullerenes are allotropes of _____.

(A) Nitrogen

(B) Carbon

(C) Oxygen

(D) Phosphorous

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

(A) Earth

(B) Soot

(C) Smoke

(D) Fog

81. The fullerenes are made up with :

(A) Graphene sheets

(B) Graphite

(C) Lead

(D) Carbide

82. _____ is the smallest buang ball cluster.

(A) C_6

(B) C_{10}

(C) C_{20}

(D) C_{40}

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

(A) 10 mm

(B) 40 mm

(C) 40 nm

(D) 100 Pm

84. _____ is an organic nanoparticles :

(A) Carbon Nanotubes

(B) Gold

(C) Silica

(D) Zine oxide

85. _____ is used in solar cell

(A) Carbon nano tubes

(B) Nano rods

(C) Nano bots

(D) None

86. _____ is used in cancer therapeutics.

(A) Carbon nanotubes

(B) Nano rods

(C) Nano bots

(D) All

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

(A) One

(B) Two

(C) Three

(D) Four

88. The full form of SEM is :

(A) Scanning electron microscope

(B) Scanning electrode microscope

(C) Surface electrode materials

(D) Surface electron microscope

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

(A) Nanomaterials

(B) Metal complex

(C) Bulk materials

(D) None of them

90. Toxicity of nanomaterials is not primarily dependent on :

(A) Surface charge

(B) Surface area

(C) Particle size

(D) Thermal conductivity

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

(A) Dendrimers

(B) Oligomers

(C) Composite

(D) Carbon materials

92. The most important property of nanomaterials is :

(A) Pressure

(B) Temperature

(C) Force

(D) Friction

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

(A) Newton

(B) Einstein

(C) Bohr

(D) Richard Feynman

94. The colour of nano gold particle is :

(A) Orange

(B) Yellow

(C) Red

(D) Above all

95. The dimension of nanomaterials is less than _____.

(A) 1 nm

(B) 10 nm

(C) 100 nm

(D) 500 nm

96. Quantum dat can be used in :

(A) Quantum physics

(B) Quantum mechanics

(C) Opto electronics

(D) Above all

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

(A) Gel

(B) Arogel

(C) Asosol

(D) Foam

98. Nano scale Aluminium oxide increases the_____.

(A) Conductivity

(B) Resistance

(C) Ductility

(D) Stability

99. One Picometer is equal to _____.

(A) 10^{-3} m

(B) 10^{-6} m

(C) 10^{-12} m

(D) 10^{-9} m

100. One Nanometer is equal to _____.

(A) 10^{-6} m

(B) 10^{-9} m

(C) 10^{-12} m

(D) 10^{-15} m

******

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