

Roll No.-----

<b>Paper Code</b>		
<b>2</b>	<b>6</b>	<b>4</b>
(To be filled in the OMR Sheet)		

प्रश्नपुस्तिका क्रमांक  
Question Booklet No.

O.M.R. Serial No.

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प्रश्नपुस्तिका सीरीज  
Question Booklet Series

**A**

**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

- K-264**
- 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, जिनमें से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने हैं। 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 प्वाइंट 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 जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।



1. One Nanometer is equal to \_\_\_\_\_.  
(A)  $10^{-6}$  m  
(B)  $10^{-9}$  m  
(C)  $10^{-12}$  m  
(D)  $10^{-15}$  m
2. One Picometer is equal to \_\_\_\_\_.  
(A)  $10^{-3}$  m  
(B)  $10^{-6}$  m  
(C)  $10^{-12}$  m  
(D)  $10^{-9}$  m
3. Nano scale Aluminium oxide increases the \_\_\_\_\_.  
(A) Conductivity  
(B) Resistance  
(C) Ductility  
(D) Stability
4. Nanomaterials synthesized by sol-gel technique results in a foam like structure is called :  
(A) Gel  
(B) Arogel  
(C) Asosol  
(D) Foam
5. Quantum dot can be used in :  
(A) Quantum physics  
(B) Quantum mechanics  
(C) Opto electronics  
(D) Above all

6. The dimension of nanomaterials is less than \_\_\_\_\_.
- (A) 1 nm
  - (B) 10 nm
  - (C) 100 nm
  - (D) 500 nm
7. The colour of nano gold particle is :
- (A) Orange
  - (B) Yellow
  - (C) Red
  - (D) Above all
8. The first talk about nano technology was given by :
- (A) Newton
  - (B) Einstein
  - (C) Bohr
  - (D) Richard Feynman
9. The most important property of nanomaterials is :
- (A) Pressure
  - (B) Temperature
  - (C) Force
  - (D) Friction
10. Nano sine polymers built from branched units are called :
- (A) Dendrimers
  - (B) Oligomers
  - (C) Composite
  - (D) Carbon materials

11. Toxicity of nanomaterials is not primarily dependent on :
- (A) Surface charge
  - (B) Surface area
  - (C) Particle size
  - (D) Thermal conductivity
12. The absorption & adsorption of molecules are fast and high in \_\_\_\_\_ materials.
- (A) Nanomaterials
  - (B) Metal complex
  - (C) Bulk materials
  - (D) None of them
13. The full form of SEM is :
- (A) Scanning electron microscope
  - (B) Scanning electrode microscope
  - (C) Surface electrode materials
  - (D) Surface electron microscope
14. The nano structure are categorized into \_\_\_\_\_ Types according to their dimensions.
- (A) One
  - (B) Two
  - (C) Three
  - (D) Four
15. \_\_\_\_\_ is used in cancer therapeutics.
- (A) Carbon nanotubes
  - (B) Nano rods
  - (C) Nano bots
  - (D) All

16. \_\_\_\_\_ is used in solar cell
- (A) Carbon nano tubes
  - (B) Nano rods
  - (C) Nano bots
  - (D) None
17. \_\_\_\_\_ is an organic nanoparticles :
- (A) Carbon Nanotubes
  - (B) Gold
  - (C) Silica
  - (D) Zine oxide
18. The size and shape of silver for blue colour is around \_\_\_\_\_.
- (A) 10 mm
  - (B) 40 mm
  - (C) 40 nm
  - (D) 100 Pm
19. \_\_\_\_\_ is the smallest buang ball cluster.
- (A)  $C_6$
  - (B)  $C_{10}$
  - (C)  $C_{20}$
  - (D)  $C_{40}$
20. The fullerenes are made up with :
- (A) Graphene sheets
  - (B) Graphite
  - (C) Lead
  - (D) Carbide

21. The naturally occurring element found in \_\_\_\_\_ is buckminsterfullerenes.
- (A) Earth
  - (B) Soot
  - (C) Smoke
  - (D) Fog
22. Fullerenes are allotropes of \_\_\_\_\_.
- (A) Nitrogen
  - (B) Carbon
  - (C) Oxygen
  - (D) Phosphorous
23. Thin film of  $C_{60}$  are \_\_\_\_\_ colour.
- (A) Blue
  - (B) Red
  - (C) Mustard
  - (D) Green
24. Spherical fullerenes are called \_\_\_\_\_.
- (A) Bucky ball
  - (B) Ducky ball
  - (C) Cricket ball
  - (D) Tennis ball
25. Which of the following are the properties of superconductors ?
- (A) Diamagnetic nature
  - (B) Zero resistivity
  - (C) Infinite conductivity
  - (D) Above all

26. In super conductivity the conductivity of materials becomes :
- (A) Zero
  - (B) Finite
  - (C) Infinite
  - (D) None of the above
27. The super conducting state is perfectly \_\_\_\_\_ in nature.
- (A) Diamagnetic
  - (B) Paramagnetic
  - (C) Ferromagnetic
  - (D) Ferrimagnetic
28. Which of the following conductor has highest critical temperature ?
- (A) Al
  - (B) Zn
  - (C) Mo
  - (D) Sn
29. The shifting of electrons in superconductors is prevented by \_\_\_\_\_.
- (A) Quantum effect
  - (B) Orbitals
  - (C) Thresold energy
  - (D) Energy barrier
30. The normal metal passes into super conducting state at \_\_\_\_\_.
- (A) High temperature
  - (B) Low temperature
  - (C) Critical temperature
  - (D) No temperature

31. The ideal superconductors exhibit \_\_\_\_\_.
- (A) Meissner effect
  - (B) Mesmeric effect
  - (C) Mesomeric effect
  - (D) Monomeric effect
32. The electron pairs in a superconductor are called \_\_\_\_\_.
- (A) Bardeen pair
  - (B) Cooper pair
  - (C) Bes pair
  - (D) Josephson pair
33. A material changes from normal to superconducting state below \_\_\_\_\_ temperature.
- (A) Curve
  - (B) Critical
  - (C) Weiss
  - (D) None
34. The maximum current that can be passed through a superconductor is called :
- (A) Supper current
  - (B) Optimum current
  - (C) Critical current
  - (D) None
35. 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

36. Which type of materials are used as bridge between human tissues & metals ?
- (A) Metallic biomaterials
  - (B) Polymeric biomaterials
  - (C) Ceramic
  - (D) All
37. Which one of the following is not a colloid ?
- (A) Milk
  - (B) Mud
  - (C) Butter
  - (D) Baric acid
38. Which of the following is an aerosol ?
- (A) Smoke
  - (B) Milk
  - (C) Cheese
  - (D) Butter
39. Which of the following will show Tyndall effect ?
- (A) Soap solution below CMC
  - (B) Soap solution above CMC
  - (C) NaCl solution
  - (D) Glucose solution
40. 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

41. What is the colloidal solution of a gas in liquid called ?
- (A) Aerosol
  - (B) Gel
  - (C) Foam
  - (D) Aerogel
42. The size of colloidal particles are in the range :
- (A) 10-100 nm
  - (B) 10-100 Pm
  - (C) 1-100  $\mu\text{m}$
  - (D) 1-10 mm
43. 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
44. A colloidal solution consists of :
- (A) A dispersed phase
  - (B) A dispersion medium
  - (C) A dispersed phase in a dispersion medium
  - (D) None
45. An emulsion is a colloidal solution of a \_\_\_\_\_ dispersed in another liquid.
- (A) Solid
  - (B) Liquid
  - (C) Gas
  - (D) Medium

46. 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
47. The lyophilic sols are :
- (A) Reversible in nature
  - (B) Irreversible in nature
  - (C) Both
  - (D) None
48. Blood is purified by :
- (A) Dialysis
  - (B) Filtration
  - (C) Coagulation
  - (D) Electro-osmosis
49. Adsorption of gases on solid surface is exothermic because :
- (A) Enthalpy is positive
  - (B) Entropy decreases
  - (C) Entropy increases
  - (D) Free energy increases
50. Adsorption theory explain \_\_\_\_\_ catalysis.
- (A) Auto
  - (B) Enzyme
  - (C) Homogenous
  - (D) Heterogeneous

51. Adsorption due to weak Vander Waals force is called :
- (A) Pseudo Adsorption
  - (B) Desorption
  - (C) Physisorption
  - (D) Chemisorption
52. 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
53. The incorrect statement for ceramics :
- (A) Hard, strong & dence
  - (B) Weak in impact strength
  - (C) Poor dielectric properties
  - (D) Above all
54. Which one of the followings are not a ceramic materials ?
- (A)  $\text{Al}_2\text{O}_3$
  - (B) SiC
  - (C)  $\text{SiO}_2$
  - (D)  $\text{Si}_2\text{N}_4$

55. The bonding in ceramics is :

- (A) Ionic
- (B) Covalent
- (C) Ionic & covalent both
- (D) Metallic

56. The ceramic materials is:

- (A) Mica
- (B) ZnS
- (C) Copper
- (D) ZnO

57. The ceramic materials are :

- (A) Brittle in nature
- (B) Inorganic materials
- (C) Good thermal insulators
- (D) All of above

58. Alumina is a \_\_\_\_\_.

- (A) Conductor
- (B) Ceramic
- (C) Semiconductor
- (D) Dielectric

59. Porcelain is a type of \_\_\_\_\_ ceramic.
- (A) White ware
  - (B) Stone
  - (C) Abrasive
  - (D) Cement
60. Which of the following is not a step in making ceramics ?
- (A) Alloying
  - (B) Vitrification
  - (C) Powder pressing
  - (D) Sintering
61. An Azeotrope occurs, when there is same \_\_\_\_\_.
- (A) Boiling point
  - (B) Melting point
  - (C) VLE composition
  - (D) Equilibrium pressure
62. An example of minimum azeotrope is :
- (A) Benzene-water
  - (B) Benzene-Alcohol
  - (C) Ethanol-water
  - (D) All

63. 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
64. Fractional distillation is a process of separation of \_\_\_\_\_.
- (A) 2 immisible liquid
  - (B) 2 misible liquid
  - (C) Liquid & solid
  - (D) Solid & gas
65. The process in which solid is directly converted to vapours state is called.
- (A) Sublimation
  - (B) Crystallization
  - (C) Filtration
  - (D) Distillation
66. Which of the following is crystallization ?
- (A) Solid-Solid separation
  - (B) Solid- liquid separation
  - (C) Solid-gas separation
  - (D) Liquid-gas separation

67. What is the purpose of recrystallization ?
- (A) To purify products
  - (B) To dissolve products
  - (C) To clean products
  - (D) To separate-out
68. Which of the following does not influence filtration ?
- (A) Viscosity
  - (B) pH
  - (C) Density
  - (D) Temperature
69. Which of the following process is used to separate insoluble particles from liquids ?
- (A) Filtration
  - (B) Extraction
  - (C) Drying
  - (D) Fractional crystallization
70. At What speed do you centrifuge blood ?
- (A) 220-250 RPM
  - (B) 2200-2500 RPM
  - (C) 1000-1500 RPM
  - (D) 4000 RPM

71. Solvent extraction is a \_\_\_\_\_ analytical technique.
- (A) Identification
  - (B) Qualitative
  - (C) Quantitative separation
  - (D) None
72. Solvent extraction is governed by \_\_\_\_\_ law.
- (A) Lambert Beer's law
  - (B) Ostwald's law
  - (C) Rault's law
  - (D) Nernst distribution law
73. Which one will change from red litmus to blue ?
- (A) NaCl
  - (B) KOH
  - (C) Glucose
  - (D) HCl
74. The additional operation requires for drying gas and liquid is \_\_\_\_\_.
- (A) Humidification
  - (B) Dehumidification
  - (C) Adsorption
  - (D) Absorption

75. The moisture inside the substance is known as \_\_\_\_\_.
- (A) Free moisture
  - (B) Unbound moisture
  - (C) Bound moisture
  - (D) Equilibrium moisture
76. After critical moisture content \_\_\_\_\_ tarts.
- (A) Saturated drying Region
  - (B) Unsaturated drying Region
  - (C) Constant drying Region
  - (D) None
77. 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
78. In which dryer, hot air jets are used for drying purposes ?
- (A) Vacuum dryer
  - (B) Spray dryer
  - (C) Roller dryer
  - (D) Fluid bed dryer

79. Drying involves \_\_\_\_\_ transfer operation.
- (A) Mass
  - (B) Heat
  - (C) Mass & Heat
  - (D) None
80. For effective drying conditions which processing factor is essential.
- (A) Height
  - (B) Weight
  - (C) Pressure
  - (D) Humidity
81. 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
82. 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

83. What is the source of heat in most of the evaporators ?
- (A) Coal
  - (B) Hot water
  - (C) Steam
  - (D) Oil bath
84. Distillation operation involves on of the following steps.
- (A) Vaporization
  - (B) Vaporization & condensation
  - (C) Crystallization
  - (D) Drying
85. Which part of the distillation apparatus represents the heat exchanger ?
- (A) Adapter
  - (B) Condenser
  - (C) Receiver
  - (D) Still
86. X-rays can be deflected by :
- (A) Flection field
  - (B) Magnetic field
  - (C) Electromagnetic field
  - (D) None of them

87. X-ray crystallography is not used to find the physical properties of \_\_\_\_\_.

(A) Liquid

(B) Solid

(C) Metal

(D) Metal complex

88. 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

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

(A) Bragg's equation

(B) Debye equation

(C) Einstein equation

(D) Nernst equation

90. 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

91. Which of the following boiler is best suited to meet the fluctuating demand of steam ?
- (A) Wilcox boiler
  - (B) Cornish boiler
  - (C) Lancashire boiler
  - (D) Locomotive boiler
92. An economizer in a boiler \_\_\_\_\_.
- (A) Increases steam pressure
  - (B) Increases steam flow
  - (C) Decreases fuel consumption
  - (D) Decreases steam pressure
93. 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
94. A wet vapour can be completely specified by :
- (A) Temperature only
  - (B) Pressure only
  - (C) Dryness fraction
  - (D) Pressure & Dryness fraction

95. 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
96. What are crystallization techniques ?
- (A) Sharp cooling
  - (B) Diffusion
  - (C) Gradual cooling
  - (D) Gradual cooling & Diffusion
97. 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
98. The parameter used ASME to define fans, blowers and compressors is :
- (A) Fan ratio
  - (B) Blade ratio
  - (C) Specific ratio
  - (D) Twist factor

99. Compressor is used to \_\_\_\_\_ the pressure of a fluid.
- (A) Increases
  - (B) Decreases
  - (C) Remains same
  - (D) Can't say
100. Pressure of which of the following substances can you increase by pump ?
- (A) Solid
  - (B) Gas
  - (C) Liquid
  - (D) Above all

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## **Rough Work / रफ कार्य**

## **Rough Work / रफ कार्य**

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  2. **This Question Booklet contains 100 questions, out of which only 75 Question are to be Answered by the examinee. Every question has 4 options and only one of them is correct. The answer which seems correct to you, darken that option number in your Answer Booklet (O.M.R ANSWER SHEET) completely with black or blue ball point pen. If any examinee will mark more than one answer of a particular question, then the answer will be marked as wrong.**
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  4. Every answer should be marked only on Answer Booklet (O.M.R ANSWER SHEET). Answer marked anywhere else other than the determined place will not be considered valid.
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