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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

प्रश्नपुस्तिका सीरीज
Question Booklet Series
A

B.Sc. (First Semester) Examination, February/March-2022

B190101T

Industrial Chemistry

(Fundamentals of Industrial Chemistry)

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 निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया 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 प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक–पृथक 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।**

647

Rough Work / रफ कार्य

1. Which one of the following has the highest value of ionic radius?

(A) Li^3

(B) B^{3+}

(C) O^{2-}

(D) F^-

2. Which element will have the higher electron affinity?

(A) Al

(B) P

(C) Si

(D) Cl

3. Which has the largest atomic size?

(A) Al

(B) Al^{2+}

(C) Al^{3+}

(D) Al^+

4. Which of the following molecular species has unpaired electron(s)?

(A) N_2

(B) F_2

(C) O_2^-

(D) O_2^{2-}

5. An element consist of 15 electrons and 20 neutron its mass number will be-

(A) 35

(B) 19

(C) 20

(D) 48

6. The shape of 'P' orbital is-

(A) Spherically symmetrical

(B) Dumbbell

(C) Double Dumbell

(D) None of these

7. Marsh gas mainly contains-

(A) Methane

(B) Ethane

(C) Propane

(D) Butane

8. The most strained cycloalkane is-

(A) Cyclopropane

(B) Cyclobutane

(C) Cyclopentane

(D) None of these

9. Kerosene is mainly the mixture of-

(A) Alkanes

(B) Alkenes

(C) Alkynes

(D) Arenes

10. What is not true of natural gas?

(A) It is a fuel

(B) It is a mixture of Hydrocarbons

(C) It is the mixture of CO_2& H_2

(D) It is found near petroleum wells

11. Sulphur molecule is-

(A) Diatomic

(B) Tetraatomic

(C) Hexaatomic

(D) Octa atomic

12. The kind of hybridization in SO_2 molecule is-

(A) SP

(B) SP^2

(C) SP^3

(D) dSP^2

13. Which of the following is not planner?

(A) SO_3

(B) SO_3^{2-}

(C) SO_2

(D) CO_3^{2-}

14. Benzene can undergo-

(A) Substitution

(B) Addition

(C) Oxidation

(D) All of these

15. Which is most readly sulphonated?

(A) Benzene

(B) Chlorobenzene

(C) Toluene

(D) Nitrobenzene

16. Which is not a flux?

(A) $CaCo_3$

(B) Lime

(C) SiO_2

(D) CaO

17. Heating of pyrites in air for oxidation of Sulphur is called-

(A) Roasting

(B) Calcination

(C) Smelting

(D) Slagging

18. Main function of roasting is-

(A) To remove volatile substances

(B) Oxidation

(C) Reduction

(D) Slag formation

19. In which state does pulverized coal burns?

(A) Gaseous

(B) Liquid

(C) Solid

(D) Colloidal

20. Which type of firing technique is employed for pulverized coal?

(A) Oxidation firing

(B) Reduction firing

(C) Front wall firing

(D) Raker firing

21. Which is the primary component of crude oil?

(A) Sulphur

(B) Carbon

(C) Hydrogen

(D) Nitrogen

22. How is crude oil separated?

(A) Crystallization

(B) Fractional distillation

(C) Decantation

(D) Sublimation

23. Natural gasoline is produced-

(A) Frame oil wells

(B) In oil refineries

(C) By natural gas stripping

(D) None of these

24. Kerosene is used in -/As-

(A) Ointments

(B) Jet engines

(C) Fuel

(D) Lubricants

25. Bitument is used in-

(A) Electronic-generators

(B) Road surfacing

(C) Coal tar

(D) Natural gas

26. Heating are with carbon in the absence of air is known as-

(A) Reduction

(B) Carbon-reduction

(C) Smelting

(D) Roasting

27. In the extraction of copper from sulphide ore, the metal is formed by reduction of Cu_2O with-

(A) FeS

(B) CO

(C) Cu_2S

(D) SO_2

28. The purest form of Iron is-

(A) Cast iron

(B) Pig iron

(C) Wrought iron

(D) Steel

29. Stainless steel is so called because of its-

(A) High strength

(B) High corrosion resistance

(C) High ductility

(D) Brittleness

30. Final structure of austempered steel-

(A) Pearlite

(B) Ferrite + graphite

(C) Bainite

(D) Martensite

31. Bronze is an alloy of-

(A) Copper and Nickel

(B) Copper and Iron

(C) Copper and Tin

(D) Copper and Aluminium

32. The boiling range of Gasoline is-

(A) 40 – 200℃

(B) 180 – 250℃

(C) 350 – 450℃

(D) 450℃+

33. $C_nH_2n$is the general formula of-

(A) Alkanes

(B) Alkenes

(C) Alkyene

(D) None of these

34. Which of these termed as – 'short-residue'?

(A) Vaccum Residue

(B) Atmospheric Residue

(C) Both (A) & (B)

(D) None of these

35. The pressure is kept ⊥ Bar during-

(A) Vaccum distillation

(B) Atmospheric distillation

(C) Steam distillation

(D) Azeotrophic distillation

36. The temperature is kept 125 – 130℃ during-

(A) Desalting of crude oil

(B) Vaccum distillation

(C) Cracking

(D) None of these

37. Which of the following is not an alloy?

(A) Steel

(B) Copper

(C) Brass

(D) Bronze

38. White cost iron contains carbon in the form of-

(A) Free carbon

(B) Graphite

(C) Cementite

(D) None of these

39. Melting point of Fe is-

(A) 1539℃

(B) 1601℃

(C) 1489℃

(D) 1712℃

40. Rusting of Iron takes place in-

(A) Ordinary water

(B) Distilled water

(C) Both (A) & (B)

(D) None of the above

41. During electrolytic reduction, the metals are deposited at-

(A) Cathode

(B) Anode

(C) Both Cathode & Anode

(D) At the bottom of Electrolytic-cell

42. Stainless steel is very useful material for our life, In stainless steel, iron is mixed with-

(A) Ni & Cr

(B) Cu & Cr

(C) Ni & Cu

(D) Cu & Au

43. The species which does not show paramegnetism is-

(A) O^2

(B) O_2^+

(C) O_2^{2-}

(D) H_2^+

44. Lanthanide Ion which is most likely to be reduced by Cr (+II)is-

(A) Sm

(B) Yu

(C) Yb

(D) All of these

45. Which molecule is T-shaped?

(A) BeF_2

(B) BCl_3

(C) NH_3

(D) ClF_3

46. How many unpaired electrons are present in N_2^+ -

(A) 1

(B) 2

(C) 3

(D) 4

47. Which of the following has zero dipole moment?

(A) CO_2

(B) SO_2

(C) H_2O

(D) NH_3

48. Which has fractional bond order?

(A) O_2^{2+}

(B) O_2^{2-}

(C) F_2^{2-}

(D) H_2^-

49. Which of the following is the weakest-bond?

(A) Hydrogen Bond

(B) Covalent Bond

(C) Metallic Bond

(D) Ionic

50. Electronegativity of Beryllium is approximately equal to that of-

(A) Aluminium

(B) Boron

(C) Mg

(D) Sodium

51. If the electronic-Configuration of oxygen atom in ground state is written as $\perp s^2, 2s^2$

↑↓ ↑↓

It would violate-

(A) Hund's Rule

(B) Pauli's exclusion principle

(C) Both (A) & (B)

(D) None of these

52. Which ion has the higher polarizing power?

(A) Mg^{++}

(B) Al^{+++}

(C) Ca^{++}

(D) Na^{+}

53. A metal which does not liberate H_2 (g) from acids?

(A) Cu

(B) Fe

(C) Mn

(D) Zn

54. Paramagnetism is not shown by-

(A) O_2^-

(B) H_2^+

(C) O_2

(D) O_2^{2-}

55. Which of the following exist as dimer?

(A) $AlCl_3$

(B) $CaCl_2$

(C) NCl_3

(D) BF_3

56. Liquid Ammonia and Liquour Ammonia are-

(A) Same

(B) Different

(C) Allotropes

(D) None of these

57. In Benzene, C atom exhibits the hybridization-

(A) SP

(B) SP^2

(C) SP^3

(D) SP^3d

58. The outermost electronic configuration of copper (29) is-

(A) $3d^5, 4s^1$

(B) $3d^5, 4s^1$

(C) $3d^9, 4s^1$

(D) $3d^{10}, 4s^1$

59. The shape of a molecule which has three bond pairs and one lone pair is-

(A) Octahedral

(B) Triangular planner

(C) Pyramidal

(D) Tetrahedral

60. The strongest base is-

(A) AsH_3

(B) NH_3

(C) PH_3

(D) SbH_3

61. Which is not present in clear hard water?

(A) $MgCO_3$

(B) $MgSO_4$

(C) $CaCl_2$

(D) H_2SO_4

62. Which of the following hydrides is most stable?

(A) NH_3

(B) PH_3

(C) AsH_3

(D) SbH_3

63. X_eF_6 is-

(A) Octahedral

(B) Distorted octahedral

(C) Planar

(D) Tetrahedral

64. The element with highest value of first Ionization potential is-

(A) Boron

(B) Carbon

(C) Nitrogen

(D) Oxygen

65. In which molecule are all atoms coplanar?

(A) CH_4

(B) BF_3

(C) PF_3

(D) NH_3

66. Marshall's acid is-

(A) $H_2S_2O_7$

(B) H_2SO_3

(C) $H_2S_2O_8$

(D) H_2SO_5

67. Which one of the following has square planar geometry?

(A) BeF_4^{--}

(B) SiF_4

(C) $SnCl_4$

(D) ICl_4^-

68. The Borax bead is-

(A) B_2O_3

(B) $Na_2B_4O_7$

(C) Na_2BO_3

(D) B_2O_3+$NaBO_2$

69. The most acidic oxide is-

(A) Ti_2O_3

(B) B_2O_3

(C) Ga_2O_3

(D) Al_2O_3

70. Which of the following is known as "king of chemicals"?

(A) H_2O

(B) H_2SO_4

(C) C_6H_6

(D) CH_4

71. Which of the following decreases the rate of reactions ?

(A) Catalytic Promoters

(B) Catalytic Poison

(C) Heterogeneous Catalyst

(D) Homogeneous Catalyst

72. Among N, O, F, Cl, S which have same value of electronegativity on Pauling scale?

(A) N,O

(B) N,S

(C) N, Cl

(D) Cl, S

73. An sp^3hybrid orbital Contains-

(A) ¼ s character

(B) ½ s character

(C) 2/3s character

(D) ¾ s character

74. Second electron affinity of an element-

(A) Is always positive

(B) Is always negative

(C) Can be positive or negative

(D) Is always zero

75. The value of bond order in He_2^+ -

(A) Zero

(B) 2

(C) 1/2

(D) 1

76. Which of the following is obtained at lowest temperature by fractional distillation of petroleum?

(A) Kerosene

(B) Diesel

(C) Gasoline

(D) LPG

77. Normal butane convert into Isobutane by-

(A) Li Al H_4

(B) Al Cl_3

(C) Na BH_4

(D) Zn/HCl

78. Most of the hydrocarbons from petroleum are obtained by-

(A) Fractional Distillation

(B) Vaporization

(C) Polymerization

(D) Fractional-Crystallization

79. LPG is separated during-

(A) Steam Distillation

(B) Fractional Distillation

(C) Azeotrophic Distillation

(D) None of the above

80. Natural gas is a mixture of-

(A) $CO+CO_2$

(B) $CO+N_2$

(C) $CO+H_2+CH_4$

(D) $CH_4+C_2H_6+C_3H_8$

81. At room Temperature solid Paraffin is-

(A) C_3H_8

(B) C_3H_{18}

(C) C_4H_{10}

(D) $C_{20}H_{42}$

82. The electrophile in aromatic- compounds nitration is-

(A) Nitronium Ion

(B) Nitrate Ion

(C) Nitrinium Ion

(D) Nitrate Ion

83. In Friedel - Craft acylation, the electrophile is-

(A) CH_3Co^+

(B) $C_6Co_5^+$

(C) $AlCl_3$

(D) CH_3^+

84. The –CHO group in Benzaldehyde is-

(A) Ortho directing

(B) Meta directing

(C) Para directing

(D) Ortho & Para directing

85. Benzene can undergo-

(A) Substitution

(B) Addition

(C) Elimination

(D) Oxidation

86. Coal Tar is main source of-

(A) Aromatic compounds

(B) Aliphatic compounds

(C) Cycloalkanes

(D) Heterocyclic compounds

87. Nitration of benzene is-

(A) Nucleophilic Substitution

(B) Electrophilic Substitution

(C) Nucleophilic Addition

(D) Free radical substitutions

88. Benzene reacts with CH_3CoCl_3 in the presence of $AlCl_3$ to give-

(A) C_6H_5Cl

(B) C_6H_5CoCl

(C) $C_6H_5CH_3$

(D) $C_6H_5CoCH_3$

89. In H_2SO_4 molecule Sulphur is hybridized as-

(A) sp^3

(B) sp^2

(C) sp

(D) sp^3d

90. The maximum number of Hydrogen bonds a water molecule can form is-

(A) 2

(B) 4

(C) 3

(D) 1

91. The component that contains electron deficient central atom is-

(A) $ZnCl_2$

(B) BCl_3

(C) NCl_3

(D) H_2O

92. In nuclear reactors, graphite is used as-

(A) Fuel

(B) Lubricant

(C) Moderator

(D) Insulator

93. Which of the following elements forms the highest number of compounds?

(A) Oxygen

(B) Hydrogen

(C) Chlorine

(D) Carbon

94. The natural source of hydrocarbon is-

(A) Crude oil

(B) Biomass

(C) Coal

(D) Carbohydrate

95. Baking soda is-

(A) Na_2CO_3

(B) K_2ClO_3

(C) Na_2SO_4

(D) $NaHCO_3$

96. What is the chemical formula of dry Ice?

(A) CO

(B) CO_2

(C) H_2O

(D) H_2O_2

97. Which of the following compound reacts with $NaNO_2$ and HCl?

(A) Phenol

(B) Aniline

(C) Both (A) & (B)

(D) None of these

98. In Laboratory Benzene can be prepaired by-

(A) Benzyl chloride

(B) Chlorobenzene

(C) Sodium Benzoate

(D) None of these

99. Which is most readily Sulphonated?

(A) Benzene

(B) Chlorobenzene

(C) Toluene

(D) Nitrobenzene

100. What type of gas is LPG?

(A) Gasoline

(B) Kerosene

(C) Uncondensed

(D) Heavy oil

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