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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No. | | | | | | | | |

प्रश्नपुस्तिका सीरीज
Question Booklet Series
C

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।**

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Rough Work / रफ कार्य

1. What type of gas is LPG?

(A) Gasoline

(B) Kerosene

(C) Uncondensed

(D) Heavy oil

2. Which is most readily Sulphonated?

(A) Benzene

(B) Chlorobenzene

(C) Toluene

(D) Nitrobenzene

3. In Laboratory Benzene can be prepaired by-

(A) Benzyl chloride

(B) Chlorobenzene

(C) Sodium Benzoate

(D) None of these

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

(A) Phenol

(B) Aniline

(C) Both (A) & (B)

(D) None of these

5. What is the chemical formula of dry Ice?

(A) CO

(B) CO_2

(C) H_2O

(D) H_2O_2

6. Baking soda is-

(A) Na_2CO_3

(B) K_2ClO_3

(C) Na_2SO_4

(D) $NaHCO_3$

7. The natural source of hydrocarbon is-

(A) Crude oil

(B) Biomass

(C) Coal

(D) Carbohydrate

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

(A) Oxygen

(B) Hydrogen

(C) Chlorine

(D) Carbon

9. In nuclear reactors, graphite is used as-

(A) Fuel

(B) Lubricant

(C) Moderator

(D) Insulator

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

(A) $ZnCl_2$

(B) BCl_3

(C) NCl_3

(D) H_2O

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

(A) 2

(B) 4

(C) 3

(D) 1

12. In H_2SO_4 molecule Sulphur is hybridized as-

(A) sp^3

(B) sp^2

(C) sp

(D) sp^3d

13. 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) $C_6H_5CoCH_3$

14. Nitration of benzene is-

(A) Nucleophilic Substitution

(B) Electrophilic Substitution

(C) Nucleophilic Addition

(D) Free radical substitutions

15. Coal Tar is main source of-

(A) Aromatic compounds

(B) Aliphatic compounds

(C) Cycloalkanes

(D) Heterocyclic compounds

16. Benzene can undergo-

(A) Substitution

(B) Addition

(C) Elimination

(D) Oxidation

17. The –CHO group in Benzaldehyde is-

(A) Ortho directing

(B) Meta directing

(C) Para directing

(D) Ortho & Para directing

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

(A) CH_3Co^+

(B) $C_6Co_5^+$

(C) $AlCl_3$

(D) CH_3^+

19. The electrophile in aromatic- compounds nitration is-

(A) Nitronium Ion

(B) Nitrate Ion

(C) Nitrinium Ion

(D) Nitrate Ion

20. At room Temperature solid Paraffin is-

(A) C_3H_8

(B) C_3H_{18}

(C) C_4H_{10}

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

21. Natural gas is a mixture of-

(A) $CO+CO_2$

(B) $CO+N_2$

(C) $CO+H_2+CH_4$

(D) $CH_4+C_2H_6+C_3H_8$

22. LPG is separated during-

(A) Steam Distillation

(B) Fractional Distillation

(C) Azeotrophic Distillation

(D) None of the above

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

(A) Fractional Distillation

(B) Vaporization

(C) Polymerization

(D) Fractional-Crystallization

24. Normal butane convert into Isobutane by-

(A) Li Al H_4

(B) Al Cl_3

(C) Na BH_4

(D) Zn/HCl

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

(A) Kerosene

(B) Diesel

(C) Gasoline

(D) LPG

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

(A) Zero

(B) 2

(C) 1/2

(D) 1

27. Second electron affinity of an element-

(A) Is always positive

(B) Is always negative

(C) Can be positive or negative

(D) Is always zero

28. An sp^3hybrid orbital Contains-

(A) ¼ s character

(B) ½ s character

(C) 2/3s character

(D) ¾ s character

29. 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

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

(A) Catalytic Promoters

(B) Catalytic Poison

(C) Heterogeneous Catalyst

(D) Homogeneous Catalyst

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

(A) H_2O

(B) H_2SO_4

(C) C_6H_6

(D) CH_4

32. The most acidic oxide is-

(A) Ti_2O_3

(B) B_2O_3

(C) Ga_2O_3

(D) Al_2O_3

33. The Borax bead is-

(A) B_2O_3

(B) $Na_2B_4O_7$

(C) Na_2BO_3

(D) B_2O_3+$NaBO_2$

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

(A) BeF_4^{--}

(B) SiF_4

(C) $SnCl_4$

(D) ICl_4^-

35. Marshall's acid is-

(A) $H_2S_2O_7$

(B) H_2SO_3

(C) $H_2S_2O_8$

(D) H_2SO_5

36. In which molecule are all atoms coplanar?

(A) CH_4

(B) BF_3

(C) PF_3

(D) NH_3

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

(A) Boron

(B) Carbon

(C) Nitrogen

(D) Oxygen

38. X_eF_6 is-

(A) Octahedral

(B) Distorted octahedral

(C) Planar

(D) Tetrahedral

39. Which of the following hydrides is most stable?

(A) NH_3

(B) PH_3

(C) AsH_3

(D) SbH_3

40. Which is not present in clear hard water?

(A) $MgCO_3$

(B) $MgSO_4$

(C) $CaCl_2$

(D) H_2SO_4

41. The strongest base is-

(A) AsH_3

(B) NH_3

(C) PH_3

(D) SbH_3

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

(A) Octahedral

(B) Triangular planner

(C) Pyramidal

(D) Tetrahedral

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

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

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

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

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

44. In Benzene, C atom exhibits the hybridization-

(A) SP

(B) SP^2

(C) SP^3

(D) SP^3d

45. Liquid Ammonia and Liquour Ammonia are-

(A) Same

(B) Different

(C) Allotropes

(D) None of these

46. Which of the following exist as dimer?

(A) $AlCl_3$

(B) $CaCl_2$

(C) NCl_3

(D) BF_3

47. Paramagnetism is not shown by-

(A) O_2^-

(B) H_2^+

(C) O_2

(D) O_2^{2-}

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

(A) Cu

(B) Fe

(C) Mn

(D) Zn

49. Which ion has the higher polarizing power?

(A) Mg^{++}

(B) Al^{+++}

(C) Ca^{++}

(D) Na^{+}

50. 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

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

(A) Aluminium

(B) Boron

(C) Mg

(D) Sodium

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

(A) Hydrogen Bond

(B) Covalent Bond

(C) Metallic Bond

(D) Ionic

53. Which has fractional bond order?

(A) O_2^{2+}

(B) O_2^{2-}

(C) F_2^{2-}

(D) H_2^-

54. Which of the following has zero dipole moment?

(A) CO_2

(B) SO_2

(C) H_2O

(D) NH_3

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

(A) 1

(B) 2

(C) 3

(D) 4

56. Which molecule is T-shaped?

(A) Be F_2

(B) BCl_3

(C) NH_3

(D) ClF_3

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

(A) Sm

(B) Yu

(C) Yb

(D) All of these

58. The species which does not show paramegnetism is-

(A) O^2

(B) O_2^+

(C) O_2^{2-}

(D) H_2^+

59. 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

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

(A) Cathode

(B) Anode

(C) Both Cathode & Anode

(D) At the bottom of Electrolytic-cell

61. Rusting of Iron takes place in-

(A) Ordinary water

(B) Distilled water

(C) Both (A) & (B)

(D) None of the above

62. Melting point of Fe is-

(A) 1539℃

(B) 1601℃

(C) 1489℃

(D) 1712℃

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

(A) Free carbon

(B) Graphite

(C) Cementite

(D) None of these

64. Which of the following is not an alloy?

(A) Steel

(B) Copper

(C) Brass

(D) Bronze

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

(A) Desalting of crude oil

(B) Vaccum distillation

(C) Cracking

(D) None of these

66. The pressure is kept ⊥ Bar during-

(A) Vaccum distillation

(B) Atmospheric distillation

(C) Steam distillation

(D) Azeotrophic distillation

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

(A) Vaccum Residue

(B) Atmospheric Residue

(C) Both (A) & (B)

(D) None of these

68. $C_nH_2n$is the general formula of-

(A) Alkanes

(B) Alkenes

(C) Alkyene

(D) None of these

69. The boiling range of Gasoline is-

(A) 40 – 200℃

(B) 180 – 250℃

(C) 350 – 450℃

(D) 450℃+

70. Bronze is an alloy of-

(A) Copper and Nickel

(B) Copper and Iron

(C) Copper and Tin

(D) Copper and Aluminium

71. Final structure of austempered steel-

(A) Pearlite

(B) Ferrite + graphite

(C) Bainite

(D) Martensite

72. Stainless steel is so called because of its-

(A) High strength

(B) High corrosion resistance

(C) High ductility

(D) Brittleness

73. The purest form of Iron is-

(A) Cast iron

(B) Pig iron

(C) Wrought iron

(D) Steel

74. 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

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

(A) Reduction

(B) Carbon-reduction

(C) Smelting

(D) Roasting

76. Bitument is used in-

(A) Electronic-generators

(B) Road surfacing

(C) Coal tar

(D) Natural gas

77. Kerosene is used in -/As-

(A) Ointments

(B) Jet engines

(C) Fuel

(D) Lubricants

78. Natural gasoline is produced-

(A) Frame oil wells

(B) In oil refineries

(C) By natural gas stripping

(D) None of these

79. How is crude oil separated?

(A) Crystallization

(B) Fractional distillation

(C) Decantation

(D) Sublimation

80. Which is the primary component of crude oil?

(A) Sulphur

(B) Carbon

(C) Hydrogen

(D) Nitrogen

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

(A) Oxidation firing

(B) Reduction firing

(C) Front wall firing

(D) Raker firing

82. In which state does pulverized coal burns?

(A) Gaseous

(B) Liquid

(C) Solid

(D) Colloidal

83. Main function of roasting is-

(A) To remove volatile substances

(B) Oxidation

(C) Reduction

(D) Slag formation

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

(A) Roasting

(B) Calcination

(C) Smelting

(D) Slagging

85. Which is not a flux?

(A) $CaCo_3$

(B) Lime

(C) SiO_2

(D) CaO

86. Which is most readly sulphonated?

(A) Benzene

(B) Chlorobenzene

(C) Toluene

(D) Nitrobenzene

87. Benzene can undergo-

(A) Substitution

(B) Addition

(C) Oxidation

(D) All of these

88. Which of the following is not planner?

(A) SO_3

(B) SO_3^{2-}

(C) SO_2

(D) CO_3^{2-}

89. The kind of hybridization in SO_2 molecule is-

(A) SP

(B) SP^2

(C) SP^3

(D) dSP^2

90. Sulphur molecule is-

(A) Diatomic

(B) Tetraatomic

(C) Hexaatomic

(D) Octa atomic

91. 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

92. Kerosene is mainly the mixture of-

(A) Alkanes

(B) Alkenes

(C) Alkynes

(D) Arenes

93. The most strained cycloalkane is-

(A) Cyclopropane

(B) Cyclobutane

(C) Cyclopentane

(D) None of these

94. Marsh gas mainly contains-

(A) Methane

(B) Ethane

(C) Propane

(D) Butane

95. The shape of 'P' orbital is-

(A) Spherically symmetrical

(B) Dumbbell

(C) Double Dumbell

(D) None of these

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

(A) 35

(B) 19

(C) 20

(D) 48

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

(A) N_2

(B) F_2

(C) O_2^-

(D) O_2^{2-}

98. Which has the largest atomic size?

(A) Al

(B) Al^{2+}

(C) Al^{3+}

(D) Al^+

99. Which element will have the higher electron affinity?

(A) Al

(B) P

(C) Si

(D) Cl

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

(A) Li^{3}

(B) B^{3+}

(C) O^{2-}

(D) F^{-}

******

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