A

792

Paper Code : 19 Sr. No. .....

CHEMISTRY [Paper-II]

Signature and Name of Invigilator

1. (Signature) _____
   (Name) _____
2. (Signature) _____
   (Name) _____

OMR Sheet No. : .....
(To be filled by the candidate)

Roll No. | | | | | | | | | | |
(In Figures as per admission card)

Roll No. _____
(In words)

Time : 1¼ Hours] **[Maximum Marks : 100**

Number of Pages in this Booklet : 8 **Number of Questions in this Booklet : 50**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. At the commencement of examination, the question bookelt will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Fault booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
   (ii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.
   Example : (A) (B) ● (D)
   where (C) is the correct response.
5. Your responses to the items are to be indicated in the Answer Sheet given inside the Paper I Booklet only. If you mark at any place other than in the ovals in the Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the test booklet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the test question booklet and OMR Answer sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
10. Students can take home carbon copy of this OMR answer sheet.
11. Use only Blue/Black Ball point pen.
12. Use of any calculator or log table etc., is prohibited.
13. There is no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

1. पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
2. इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं।
3. परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी। पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे, जिसकी जाँच आपको अवश्य करनी है :
   (i) कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चैक कर लें कि ये पूरे हैं। दोषपूर्ण पुस्तिका जिनमें पृष्ठ/प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात् किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें। इसके लिए आपको पाँच मिनट दिये जायेंगे। उसके बाद न तो आपकी प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जावेगा।
   (ii) इस जाँच के बाद OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें।
4. प्रत्येक प्रश्न के लिए चार उत्तर पत्रक विकल्प (A), (B), (C) तथा (D) दिये गये हैं। आपको सही उत्तर के दीर्घवृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।
   उदाहरण : (A) (B) ● (D)
   जबकि (C) सही उत्तर है।
5. प्रश्नों के उत्तर केवल प्रश्न पत्र I के अन्दर दिये गये उत्तर-पत्रक पर ही अंकित करने हैं। यदि आप उत्तर पत्रक पर दिये गये दीर्घवृत्त के अलावा किसी अन्य स्थान पर उत्तर चिह्नांकित करते हैं, तो उसका मूल्यांकन नहीं होगा।
6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें।
8. यदि आप उत्तर-पुस्तिका पर अपना नाम या ऐसा कोई भी निशान करते हैं तो परीक्षा के लिये अयोग्य घोषित कर दिये जायेंगे।
9. आपको परीक्षा समाप्त होने पर प्रश्न-पुस्तिका एवं OMR उत्तर-पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें।
10. परीक्षा समाप्ति पर परीक्षार्थी OMR उत्तर-पत्रक की कार्बन कापी अपने साथ ले जा सकते हैं।
11. केवल नीले/काले बाल प्वाईंट पेन का ही इस्तेमाल करें।
12. किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।
13. गलत उत्तरों के लिए कोई अंक काटे नहीं जाएँगे।

Paper Code : [19]

Paper-II [CHEMISTRY]

Note : • **This paper contains Fifty (50) multiple choice questions, each question carrying two (2) marks.**

नोट : • **इस प्रश्नपत्र में पचास (50) बहुविकल्पीय प्रश्न हैं। प्रत्येक प्रश्न के दो (2) अंक हैं।**

1. The enormous energy released in an atomic explosive is due to the conversion of :
   (A) Neutrons into protons
   (B) Mechanical energy into nuclear energy
   (C) Mass into energy
   (D) Chemical energy into heat energy
2. Permanent hardness of water cannot be removed by :
   (A) Boiling
   (B) Distillation
   (C) Passing through chlorine gas
   (D) Adding sodium carbonate
3. The element's present in the largest amount in rocks and minerals is :
   (A) Gold
   (B) Carbon
   (C) Hydrogen
   (D) Silicon
4. Acid rain results due to :
   (A) Oxides of nitrogen and sulphur dioxide
   (B) Ammonia
   (C) Carbon monoxide
   (D) Oxide of nitrogen
5. The industrial preparation of the metal aluminium from bauxite involves the process of :
   (A) Electrolysis
   (B) Reduction
   (C) Fractional distillation
   (D) Fractional crystallisation
6. Radio carbon dating is used to find the age of :
   (A) Building
   (B) Fossils
   (C) Babies
   (D) Rocks
7. The green color of the grass is due to :
   (A) Starch
   (B) Cellulose
   (C) Chlorophyll
   (D) Carbohydrate
8. Coloured glasses of goggles contain :
   (A) Ferrous oxide
   (B) Lanthanide oxide
   (C) Nickel oxide
   (D) Ferric oxide
9. Which one is not an instrument for detecting radiation ?
   (A) Electroscope
   (B) Geiger counter
   (C) Film badge
   (D) Cyclotron

10. In a nuclear reactor :

(A) Controlled fusion reaction takes place

(B) Controlled nuclear fission reaction takes place

(C) Uncontrolled nuclear fission reaction takes place

(D) Uncontrolled nuclear fusion reaction takes place

11. The enzyme which catalyzes the hydrolysis of proteins is :

(A) Insulin (B) Steapsin

(C) Amylopsin (D) Trypsin

12. Which is not a function of Inorganic Salt ?

(A) Supply energy (B) Influence the contraction of muscles

(C) Maintain proper osmotic pressure (D) Maintain acid-base balance

13. The principal quantum number of an electron represents :

(A) Size of the orbital (B) Spin angular momentum

(C) Orbital angular momentum (D) Space orientation of the orbital

14. Which of the following molecules has highest dipole moment ?

(A) H_2S (B) CO_2

(C) CCl_4 (D) BF_3

15. The compound that is not a Lewis Acid is :

(A) BF_3 (B) $AlCl_3$

(C) $BaCl_2$ (D) $SnCl_4$

16. Catenation is :

(A) Formation of cation (B) Deposition of cation

(C) Formation of long chains of small atoms (D) Formation of covalent bonds

17. Lanthanides and actinides are recognised as :

(A) s-block elements (B) p-block elements

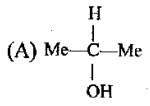
(C) d-block elements (D) f-block elements

18. A stong signal at 1700 cm^{-1} in an IR spectrum indicates the presence of :

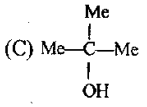
(A) alcohol (B) ether

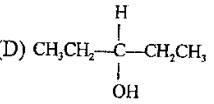
(C) carbonyl (D) amine

19. Which of the following will give positive iodoform test :

(A) 

(B) CH_3CH_2OH

(C) 

(D) 

20. Organolithiums are more reactive than Grignard reagents because :

(A) Carbon-lithium bonds are more polar (B) Carbon-magnesium bonds are more polar

(C) Carbon-lithium bonds are non polar (D) Carbon-lithium bonds are stronger

21. The correct order of reactivity in esterification reaction is :

(A) MeOH > 3° > 2° > 1° (B) MeOH > 1° > 2° > 3°

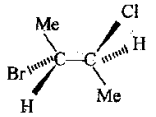
(C) 3° > 2° > 1° > MeOH (D) 1° > 2° > 3° > MeOH

22. Ylide is an intermediate of :

(A) Aldol reaction (B) Friedel-craft reaction

(C) Wittig reaction (D) Ene reaction

23. Correct name of the following compound is :



(A) (2R, 3R)-2-bromo-3-chlorobutane (B) (2S, 3S)-2-bromo-3-chlorobutane

(C) (2S, 3R)-2-bromo-3-chlorobutane (D) (2R, 3S)-2-bromo-3-chlorobutane

24. Which of the following compound has the most deshielded protons :

(A) CH_3Cl (B) CH_3I

(C) CH_3Br (D) CH_4

25. Which of the following cycloalkanes has the most strain energy :

(A) Cycloheptane (B) Cyclohexane

(C) Cyclopentane (D) Cyclobutane

26. The williamson ether synthesis produces ether by reacting on :

(A) alcohol with a metal (B) alkoxide with a metal

(C) alkoxide with an alkyl halide (D) alkyl halide with an aldehyde

27. Which of the following amino acid is achiral :

(A) alanine (B) glycine

(C) serine (D) cystcine

28. Which of the following statements about an enzyme is not correct :

(A) An enzyme is usually a large protein

(B) An enzyme is a catalyst for biological reactions

(C) An enzyme is a chiral molecule

(D) An enzyme changes the equilibrium constant of a reaction

29. Leprosy is :

(A) A disease caused by virus

(B) A disease caused by bacteria

(C) A disease caused by the deficiency of lactose in the body

(D) A disease caused by the deficiency of harmone in the body

30. Match the followings :

Column A	Column B
(A) K_3C_6O	(i) Buckite salt
(B) Precursor of C_6O	(ii) Fullerenes
(C) Football like molecule	(iii) Graphite
(D) 18-Crown-6	(iv) Cation complexation

(A) A → i ; B → iii; C → ii ; D → iv (B) A → ii ; B → i; C → iii ; D → iv

(C) A → iv ; B → iii; C → ii ; D → i (D) A → iii ; B → ii; C → iv ; D → i

31. What is the minimum number of chiral centers a meso-compound must have :

(A) 0 (B) 1

(C) 2 (D) 3

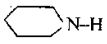
32. What is the major product of the following reaction :

$$CH_3—CO—CH_2—CH_3 \xrightarrow[MeOH]{NaBH_4}$$

(A) S-2-butanol (B) R-2-butanol

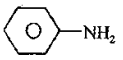
(C) Hemi ketal of 2-butanone (D) Racemic mixture of 2-butanol

33. Which of the following compound is the best Bronsted base :

(A) 

(B) 

(C) 

(D) 

34. Who coined the term Green chemistry :

(A) BM Trost
(B) Paul T Anastas
(C) John C Warner
(D) C Berzelius

35. How many sigma bonds are there in :

$CH_2 = CH - CH_2 - CH = CH_2$

(A) 4
(B) 6
(C) 9
(D) 12

36. The real gases behave like an ideal gas when :

(A) Temperature and pressure are low
(B) Temperature is low or pressure is high
(C) Temperature is high or pressure is low
(D) Temperature and pressure are high

37. Which law states that "At constant temperature the product of pressure and volume of a given amount of gas is always constant" :

(A) Charle's law
(B) Boyle's law
(C) Dalton's law
(D) Graham's law

38. The value of azimuthal quantum number for n = 3 are :

(A) 1, 2, 3
(B) 0, 1, 2
(C) 0, ±1, ±2, ±3
(D) only 1 and 2

39. Which is not affected by temperature ?

(A) Normality
(B) Formality
(C) Molarity
(D) Molality

40. Strong electrolytes are those which :

(A) Dissolve readily in water
(B) Conduct electricity
(C) Dissolve into ions at higher dilution
(D) Dissociate into ions at higher concentration

41. The concept that acid is proton donor and base is proton acceptor was given by :

(A) Arrhenius
(B) Lowry–Bronsted
(C) Lewis
(D) Faraday

42. The function of Salt bridge is :
(A) To provide link between two half-cells
(B) To allow ions to go from one cell to another
(C) To keep the emf of the cell positive
(D) To maintain electrical neutrality of the solution in two half-cells.

43. The cell constant is :
(A) $\frac{l}{a}$ (B) $\frac{a}{l}$
(C) $a \times l$ (D) $\frac{K}{R}$

44. Work done in adiabatic expansion of one mole of an ideal gas is given by :
(A) $W = C_v(T_2 - T_1)$ (B) $W = -C_v(T_2 - T_1)$
(C) $W = C_p(T_2 - T_1)$ (D) $W = -C_p(T_2 - T_1)$

45. The wrong statement is :
(A) Enzymes are specific in their actions
(B) Enzymes are capable of initiating chemical reaction
(C) Enzymes are protein in nature
(D) Enzymes are sensitive to heat

46. The compressibility of a Vanderwaall's gas at the critical state is :
(A) $\frac{3}{8}$ (B) $\frac{8}{3}$
(C) $\frac{3}{27}$ (D) $\frac{8}{27}$

47. Indicate the acceptable wave function in the following :
(A) $\psi = x$ (B) $\psi = x^2$
(C) $\psi = \sin x$ (D) $\psi = \tan x$

48. The zero point energy of a harmonic oscillator is :
(A) $h\,w$ (B) zero
(C) $\frac{1}{2}\,hw$ (D) $\frac{3}{2}\hbar w$

49. For what type of molecule, Raman active modes are Infra Red inactive and Vice versa :
(A) Molecule with plane of symmetry (B) Molecule with inversion centre
(C) Molecule with rotation axis of symmetry (D) Molecule with centre of symmetry

50. For the first order reaction, if the time taken for 50% of the reaction is 't' sec's, the time required for completion of 99.99% reaction is :
(A) 10 t (B) 5 t
(C) 2 t (D) 100 t