CET(PG) – 2018

Sr. No. : 110013

Booklet Series Code : A

Important : *Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No. *(In Figures)* | | | | | | | *(In Words)* _____

O.M.R. Answer Sheet Serial No. | | | | | | |

Signature of the Candidate : _____

Subject : M.Sc. Industrial Chemistry

Time : 90 minutes] **[Maximum Marks : 75**

Number of Questions : 75] **[Total No. of Printed Pages : 16**

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS :

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel Pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal gently when asked to do so.
5. Please check that this Question Booklet contains **75** questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel Pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
10. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
12. The Answer Sheet is designed for **computer evaluation**. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so, would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculator is not allowed.**

1. **An electric dipole with dipole moment is p, is placed in electric field E. The torque experienced by dipole is :**

(A) $p \times E$ (B) $-p \times E$

(C) $p.E$ (D) $-p.E$

2. **The magnetic flux linked with a coil is given by the equation $\phi(t) = 3t^2 + 4t + 9$ Wb. The magnitude of induced emf at t = 2 sec is :**

(A) 16 V (B) 9 V

(C) 4 V (D) 1 V

3. **The magnetic field at the centre of a current carrying loop having radius 'r' is proportional to :**

(A) r (B) 1/r

(C) r^2 (D) $1/r^2$

4. **In a Compton scattering experiment, the maximum shift in wavelength is :**

(A) h/mc (B) 2h/mc

(C) h/2mc (D) 4h/mc

5. **Surface energy term in semi empirical mass formula for liquid drop model is proportional to what power of 'A', where A is atomic mass ?**

(A) 1/3 (B) –1/3

(C) 2/3 (D) –2/3

6. **Conductivity of a semiconductor :**

(A) Increases with rise in temperature

(B) Decreases with rise in temperature

(C) Remains constant

(D) First increases and then decreases with increase in temperature

7. **An intrinsic semiconductor is an insulator at :**

(A) 0 K (B) 0°C

(C) At room temperature (D) At high temperature

8. **In Young's double slit experiment, the separation between the slits is halved and the distance between the slits and the screen is doubled. The fringe width is :**

(A) Unchanged (B) Halved

(C) Doubled (D) Quadrupled

9. **A prism splits a beam of white light into its seven constituent colours, because :**

(A) Phase of different colour is different

(B) Amplitude of different colour is different

(C) Velocity of different colour is different

(D) Energy of different colour is different

10. **An a.c. circuit contains 4 ohm resistance in series with an inductance coil of reactance 3 ohm. The impedance of the circuit is :**

(A) 7 ohm (B) 5 ohm

(C) 1 ohm (D) 4/3 ohm

11. **In Hartley oscillator, the phase change of 180° is introduced by transformer. The phase shift introduced by the transistor is :**

(A) 90° (B) 270°

(C) 360° (D) 180°

12. **The relation between Boyle temperature and temperature of inversion is :**

(A) $2T_i = T_b$ (B) $T_i = 2T_b$

(C) $T_i = T_b$ (D) $5T_i = T_b$

13. **In Bose-Einstein Condensates, the particles :**

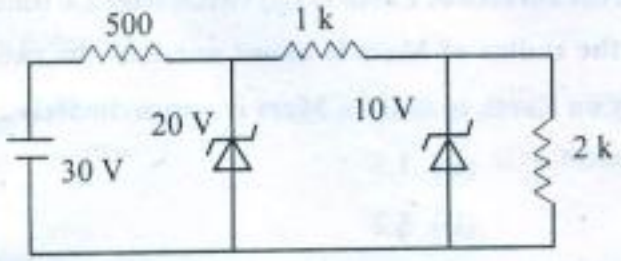
(A) Have strong interparticle attraction

(B) Condense in real space

(C) Have overlapping wave functions

(D) Have large and positive chemical potential

14. **In the following circuit, the voltage across and the current through the 2 kΩ resistance are :**



(A) 20 V, 10 mA

(B) 20 V, 5 mA

(C) 10 V, 10 mA

(D) 10 V, 5 mA

15. **Match the typical spectroscopic regions specified in Group I with the corresponding type of transitions in Group II.**

Group I	Group II
(P) Infra-red region	(i) Electronic transitions involving valence electrons
(Q) Ultraviolet-visible region	(ii) Nuclear transitions
(R) X-ray region	(iii) Vibrational transitions of molecules
(S) γ-ray region	(iv) Transitions involving inner shell electrons

(A) (P, i); (Q, iii); (R, ii); (S, iv)

(B) (P, ii); (Q, iv); (R, i); (S, iii)

(C) (P, iii); (Q, i); (R, iv); (S, ii)

(D) (P, iv); (Q, i); (R, ii); (S, iii)

16. **Helium atom in a singlet state is called :**

(A) Ortho-helium
(B) Para-helium
(C) Ionised helium
(D) Inert gas component

17. **Lyman series of hydrogen spectrum lies in the :**

(A) Visible region
(B) Infrared region
(C) Far infrared region
(D) Ultraviolet region

18. **The acceleration due to gravity (g) on the surface of Earth is approximately 2.6 times that on the surface of Mars. Given that the radius of Mars is about one half the radius of Earth, the ratio of the escape velocity on Earth to that on Mars is approximately :**

(A) 1.1
(B) 1.3
(C) 2.3
(D) 5.2

19. **The speed of a planet is minimum when it is :**

(A) Nearest to sun
(B) Farthest from sun
(C) In between nearest and farthest point
(D) Having solar eclipse

20. **Unit of Poynting vector :**

(A) W/m^2
(B) J/m^2
(C) N/m^2
(D) W/sm^2

21. **The slope of straight line plot of log K versus 1/T is :**

(A) –Ea(2.303 R)
(B) –Ea
(C) Ea
(D) None of these

22. **Among the following species, which has the minimum bond length ?**

(A) B_2
(B) C_2
(C) F_2
(D) O_2^-

23. **Which metal loses its meniscus after reaction with ozone ?**

(A) Ag (B) Hg

(C) Pb (D) Cu

24. **Ascorbic acid is :**

(A) Protein (B) Vitamin

(C) Carbohydrate (D) Enzyme

25. **Orlon is the polymer of :**

(A) Acrylonitrile (B) Vinyl chloride

(C) Styrene (D) None

26. **Which of the following diatomic molecules would be stabilized by the removal of an electron ?**

(A) C_2 (B) CN

(C) N_2 (D) O_2

27. **The correct arrangement of NH_3, N_2H_4, NH_2OH and CH_3NH_2 in the order of increasing base strength is :**

(A) $NH_3 < N_2H_4 < NH_2OH < CH_3NH_2$ (B) $NH_2OH < N_2H_4 < NH_3 < CH_3NH_2$

(C) $CH_3NH_2 < NH_3 < N_2H_4 < NH_2OH$ (D) $N_2H_4 < NH_2OH < CH_3NH_2 < NH_3$

28. **If you heat a 5 L balloon from a temperature of 25°C to 50°C, its new volume will be :**

(A) 10 L (B) 2.5 L

(C) 5.42 L (D) 4.61 L

29. **The strongest acid is :**

(A) CH_2FCOOH (B) $CH_2ClCOOH$

(C) $CHCl_2COOH$ (D) CHF_2COOH

30. **The gas used in gas thermometer is :**

(A) He (B) O_2

(C) Xe (D) Ne

31. **Tails of comets are visible due to :**

(A) Tyndall Effect (B) Reflection

(C) Brownian Motion (D) Refraction

32. **Calculate molarity of $CaCO_3$ aq. Solution which has concentration of $CaCO_3$ = 200 ppm :**

(A) 1×10^{-3} M (B) 2×10^{-3} M

(C) 4×10^{-3} M (D) 0.5×10^{-3} M

33. **50 ml of 0.2 M KOH is added to 40 ml of 0.5 M HCOOH. The pH of the resulting solution is (Ka = 1.8×10^{-4} and log 18 = 1.26) :**

(A) 3.74 (B) 5.64

(C) 7.57 (D) 3.42

34. **Which reactant is more effective to convert but-2-enal to but-2-enol ?**

(A) $K_2Cr_2O_7/H_2SO_4$ (B) $KMnO_4$

(C) H_2/Pt (D) $NaBH_4$

35. **Highest boiling point is expected for :**

(A) Iso octane (B) n-Octane

(C) 2,2,3,3-tetramethyl butane (D) n-butane

36. **Among TiF_6^{2-}, CoF_6^{3-}, Cu_2Cl_2 and $NiCl_4^{2-}$, the colourless species are :**

(A) CoF_6^{3-} and $NiCl_4^{2-}$ (B) TiF_6^{2-} and CoF_6^{3-}

(C) Cu_2Cl_2 and $NiCl_4^{2-}$ (D) TiF_6^{2-} and Cu_2Cl_2