GATE 2012 Questions

EE25BTECH11010-ARSH DHOKE

Q.1- Q.25 carry one mark each

1. In the proton decoupled ^{13}C NMR spectrum of 7-norbornanone, the number of signals obtained is

   (a) 7 (c) 4

   (b) 3 (d) 5

(GATE CY 2012)

2. Identify the most probable product in the given reaction

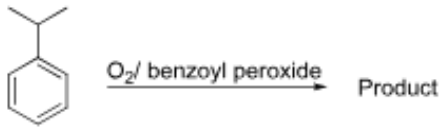


Figure 1: Figure for Q.2

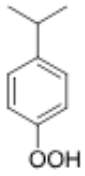
(a) 

Figure 2: Option A

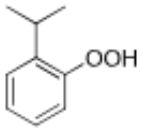
(b) 

Figure 3: Option B

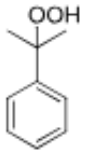
(c) 

Figure 4: Option C

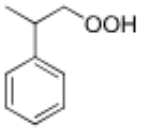
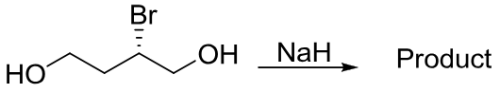
(d) 

Figure 5: Option D

(GATE CY 2012)

3. In the cyclization reaction given below, the most probable product formed is



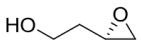
(a) 

Figure 6: Option A

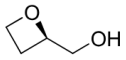
(b) 

Figure 7: Option B

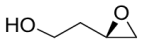
(c) 

Figure 8: Option C

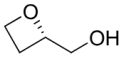
(d) 

Figure 9: Option D

(GATE CY 2012)

4. If Δy and Δp_y are the uncertainties in the y-coordinate and the y component of the momentum of a particle respectively, then, according to uncertainty principle

$$\Delta y \Delta p_y \geq \frac{h}{2\pi}$$

where h is Planck's constant.

(a) $\geq h$
(b) $> h/2$
(c) $> h$
(d) $\geq h/2$

(GATE CY 2012)

5. The average length of a typical α-helix comprised of 10 amino acids is

(a) 10 Å
(b) 15 Å
(c) 36 Å
(d) 54 Å

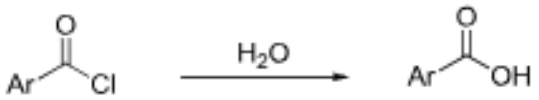
(GATE CY 2012)

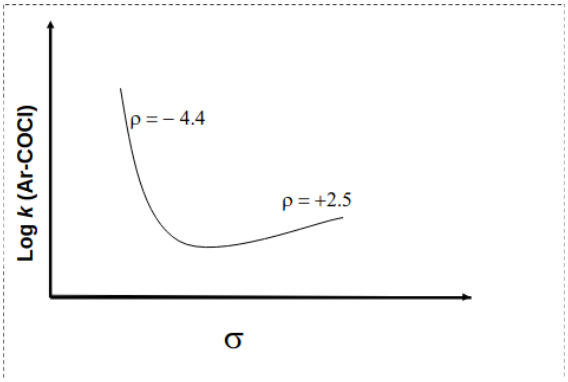
6. Number of thymine residues in a 5000 kb DNA containing 23% guanine residues is

(a) 2.70×10^8
(b) 2.70×10^7
(c) 1.35×10^6
(d) 1.35×10^7

(GATE CY 2012)

7. Shown below is a Hammett plot obtained for the reaction





The change in slope of the plot indicates that

(a) the reaction does not follow linear free energy relationship

(b) electrons are being withdrawn from the transition state in the mechanism

(c) electrons are being donated to the transition state in the mechanism

(d) the mechanism of the reaction is changing

(GATE CY 2012)

8. The ratio of relative intensities of the two molecular ion peaks of methyl bromide (CH_3Br) in the mass spectrum is

(a) $M^+ : (M+2)^+ = 1:3$

(b) $M^+ : (M+2)^+ = 3:1$

(c) $M^+ : (M+2)^+ = 1:1$

(d) $M^+ : (M+2)^+ = 1:2$

(GATE CY 2012)

9. A disaccharide that will not give Benedict's test and will not form osazone is

(a) maltose

(b) lactose

(c) cellobiose

(d) sucrose

(GATE CY 2012)

10. Choose the allowed transition

(a) $^1\Sigma_u^+ \rightarrow ^3\Sigma_g^+$

(b) $^1\Sigma_u^+ \rightarrow ^1\Sigma_u^+$

(c) $^1\Sigma_u^+ \rightarrow ^1\Sigma_g^+$

(d) $^1\Sigma_u^+ \rightarrow ^3\Sigma_u^+$

(GATE CY 2012)

11. The angular part of the wavefunction for the electron in a hydrogen atom is proportional to

$$\sin^2\theta\cos\theta\, e^{2i\phi}$$

The values of the azimuthal quantum number (l) and the magnetic quantum number (m) are, respectively

(a) 2 and 2
(b) 2 and −2
(c) 3 and 2
(d) 3 and −2

(GATE CY 2012)

12. Let $\phi^C_{2p_z}$ and $\phi^C_{2p_x}$ denote the wavefunctions of the $2p_z$ and $2p_x$ orbitals of carbon, respectively, and $\phi^O_{2p_z}$ and $\phi^O_{2p_x}$ represent the wavefunctions of the $2p_z$ and $2p_x$ orbitals of oxygen, respectively. If c_1 and c_2 are constants used in linear combinations and the CO molecule is oriented along the z-axis, then, according to molecular orbital theory, the π-bonding molecular orbital has a wavefunction given by

(a) $c_1\phi^C_{2p_x} + c_2\phi^O_{2p_x}$
(b) $c_1\phi^C_{2p_z} + c_2\phi^O_{2p_z}$
(c) $c_1\phi^C_{2p_x} + c_2\phi^O_{2p_z}$
(d) $c_1\phi^C_{2p_z} + c_2\phi^O_{2p_x}$

(GATE CY 2012)

13. The bond that gives the most intense band in the infrared spectrum for its stretching vibration is

(a) C–H
(b) N–H
(c) O–H
(d) S–H

(GATE CY 2012)

14. If x_A and x_B are the respective mole fractions of A and B in an ideal solution of the two and T_A, T_B, T are the fusion temperatures of pure A, pure B and the ideal solution respectively, then

(a) $1 - x_B = \exp\left(\dfrac{-\Delta H^{\text{fus}}(B)}{R}\left(\dfrac{1}{T} - \dfrac{1}{T_B}\right)\right)$
(b) $1 - x_B = \exp\left(\dfrac{\Delta H^{\text{fus}}(A)}{R}\left(\dfrac{1}{T} - \dfrac{1}{T_A}\right)\right)$
(c) $1 - x_B = \exp\left(\dfrac{\Delta H^{\text{fus}}(B)}{R}\left(\dfrac{1}{T} - \dfrac{1}{T_B}\right)\right)$
(d) $1 - x_B = \exp\left(\dfrac{-\Delta H^{\text{fus}}(A)}{R}\left(\dfrac{1}{T} - \dfrac{1}{T_A}\right)\right)$

(GATE CY 2012)

15. For a reaction involving two steps given below

Assume that the first step attains equilibrium rapidly. The rate of formation of P is proportional to

(a) $(G)^{1/2}$
(b) (G)
(c) $(G)^2$
(d) $(G)^{3/2}$

(GATE CY 2012)

16. A metal chelate that can be used for separation and quantitative analysis of aluminium ions by gas chromatography is

(a) EDTA
(b) ethylene glycol
(c) dinonyl phthalate
(d) trifluoroacetylacetone

(GATE CY 2012)

17. The enthalpies of hydration of Ca^{2+}, Mn^{4+} and Zn^{2+} follow the order

(a) $Mn^{4+} > Ca^{2+} > Zn^{2+}$
(b) $Zn^{2+} > Ca^{2+} > Mn^{4+}$
(c) $Mn^{4+} > Zn^{2+} > Ca^{2+}$
(d) $Zn^{2+} > Mn^{4+} > Ca^{2+}$

(GATE CY 2012)

18. The number of terminal carbonyl groups present in $Fe_2(CO)_9$ is

(a) 2
(b) 5
(c) 6
(d) 3

(GATE CY 2012)

19. Among the following substituted silanes, the one that gives cross-linked silicone polymer upon hydrolysis is

(a) $(CH_3)_4Si$
(b) CH_3SiCl_3
(c) $(CH_3)_2SiCl_2$
(d) $(CH_3)_3SiCl$

(GATE CY 2012)

20. The plot of χT versus T (where χ is molar magnetic susceptibility and T is the temperature) for a paramagnetic complex which strictly follows Curie equation is

(a)

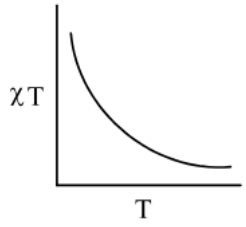


Figure 10: Option A

(b)

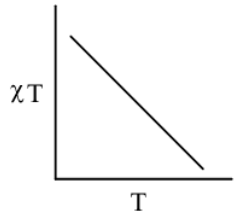


Figure 11: Option B

(c)

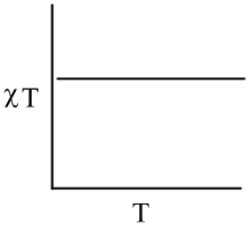


Figure 12: Option C

(d)

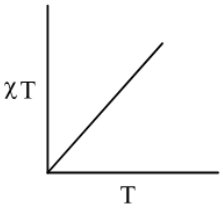


Figure 13: Option D

(GATE CY 2012)

21. Among the following donors, the one that forms most stable adduct with the Lewis acid $B(CH_3)_3$ is

(a) 4-methylpyridine
(b) 2,6-dimethylpyridine
(c) 4-nitropyridine
(d) 2,6-di-tert-butylpyridine

(GATE CY 2012)

22. The complex with *inverse*-spinel structure is

(a) Co_3O_4
(b) Fe_3O_4
(c) $MgAl_2O_4$
(d) Mn_3O_4

(GATE CY 2012)

23. The IUPAC nomenclature of $Na[PtCl_6]$ is

(a) sodium hexachlorophosphine(V)
(b) sodium hexachlorophosphate(V)
(c) sodium hexachlorophosphine
(d) sodium hexachlorophosphite(V)

(GATE CY 2012)

24. An intermediate formed during the hydroformylation of olefins using $Co_2(CO)_8$ as catalyst is

(a) $HCo(CO)_6$
(b) $H_4Co(CO)_3$
(c) $H_2Co(CO)_4$
(d) $HCo(CO)_4$

(GATE CY 2012)

25. The order of polarity of NH_3, NF_3 and BF_3 is

(a) $NH_3 < NF_3 < BF_3$
(b) $BF_3 < NF_3 < NH_3$
(c) $BF_3 < NH_3 < NF_3$
(d) $NF_3 < BF_3 < NH_3$

(GATE CY 2012)

Q.26 to Q.55 carry two marks each.

26. From a carboxymethyl-cellulose column at pH 6.0, arginine, valine and glutamic acid will elute in the order

(a) arginine, valine, glutamic acid
(b) arginine, glutamic acid, valine
(c) glutamic acid, arginine, valine
(d) glutamic acid, valine, arginine

(GATE CY 2012)

27. Symmetry operations of the four C_2 axes perpendicular to the principal axis belong to the same class in the point group(s)

(a) D_4

(b) D_{4d}

(c) D_{4h}

(d) D_{4h} and D_{4d}

(GATE CY 2012)

28. At 298 K, the EMF of the cell

$$Pt \mid H_2(1 \text{ bar}) \mid H^+(\text{solution}) \parallel Cl^- \mid Hg_2Cl_2 \mid Hg$$

is 0.7530 V. The standard potential of the calomel electrode is 0.2802 V. If the liquid junction potential is zero, the pH of the solution is

(a) 4.7

(b) 7.4

(c) 8.0

(d) 12.7

(GATE CY 2012)

29. The wavefunction of a 1-D harmonic oscillator between $x = +\infty$ and $x = -\infty$ is given by

$$\psi(x) = N(2x^2 - 1)e^{-x^2/2}.$$

The value of N that normalizes the function $\psi(x)$ is

$$\left(\text{Given: } \int_{-\infty}^{\infty} x^{2n} e^{-x^2} dx = \frac{1 \cdot 3 \cdot 5 \cdots (2n-1)}{2^n} \sqrt{\pi}\right)$$

(a) $\left(\frac{1}{8\sqrt{\pi}}\right)^{1/2}$

(b) $\left(\frac{1}{3\sqrt{\pi}}\right)^{1/2}$

(c) $\left(\frac{1}{2\sqrt{\pi}}\right)^{1/2}$

(d) $\left(\frac{1}{4\sqrt{\pi}}\right)^{1/2}$

(GATE CY 2012)

30. Consider the reaction

$$H_2 + C_2H_4 \rightarrow C_2H_6$$

The molecular diameters of H_2 and C_2H_4 are 1.8 Å and 3.6 Å respectively. The pre-exponential factor in the rate constant calculated using collision theory in $m^3(\text{mole})^{-1}s^{-1}$ is approximately

$$\left(\text{For this reaction at 300 K, } \left(\frac{8k_BT}{\pi\mu}\right)^{1/2}, \quad N_A = 1.11 \times 10^{27}\, m(\text{mole})^{-1} s^{-1}, \text{ where the symbols have their us}\right.$$

(a) 2.5×10^8

(b) 2.5×10^{14}

(c) 9.4×10^{17}

(d) 9.4×10^{23}

(GATE CY 2012)

31. The molecular partition function of a system is given by

$$q(T) = \left(\frac{k_B T}{hc}\right)^{3/2} \left(\frac{8\pi^2 m k_B T}{h^2}\right)^{3/2},$$

where the symbols have their usual meanings.

The heat capacity at constant volume for this system is

(a) 3R

(b) 6R

(c) 9R/2

(d) 3R/2

(GATE CY 2012)

32. Consider the phase diagram given below.

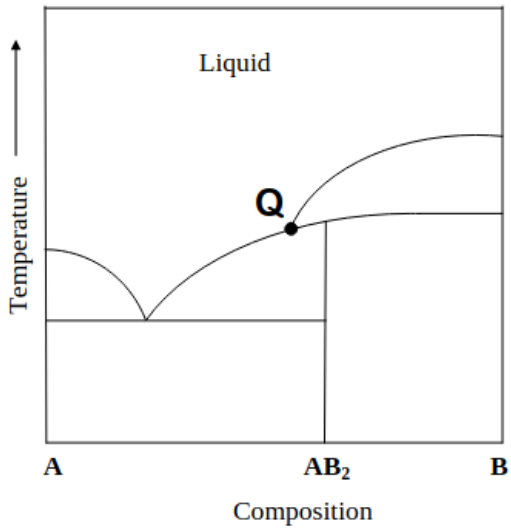


Figure 14: Figure for Q.32

At the intersection point Q the phases that are in equilibrium are

(a) solid A, solid B and solid AB_2

(b) solid A, solid AB_2 and liquid

(c) solid B, solid AB_2 and liquid

(d) solid A, solid B, solid AB_2 and liquid

(GATE CY 2012)

33. Identify the product from the following reaction

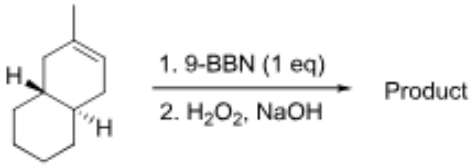


Figure 15: Figure for Q.33

(9-BBN = 9-Borabicyclo[3.3.1]nonane)

(a)

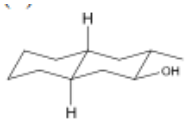


Figure 16: Option A

(b)

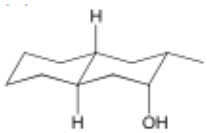


Figure 17: Option B

(c)

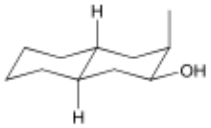


Figure 18: Option C

(d)

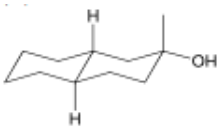


Figure 19: Option D

(GATE CY 2012)

34. The product from the following reaction is

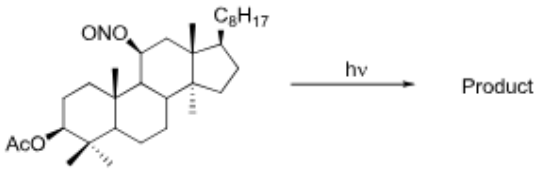


Figure 20: Figure for Q.34

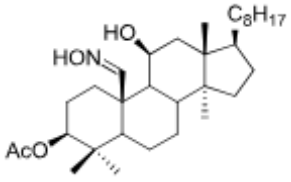
(a)


Figure 21: Option A

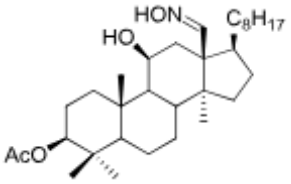
(b)


Figure 22: Option B

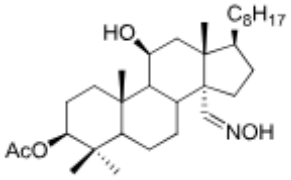
(c)


Figure 23: Option C

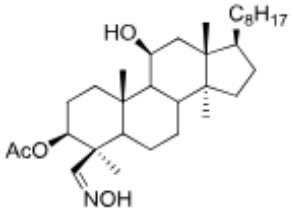
(d)


Figure 24: Option D

(GATE CY 2012)

35. The acid catalyzed cyclization of 5-ketodecan-1,9-diol is given below

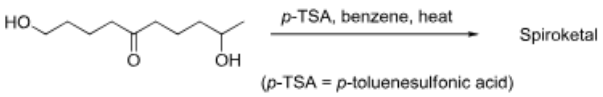


Figure 25: Figure for Q.35

The most predominant spiroketal is

(a)

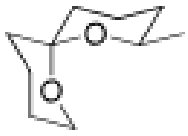


Figure 26: Option A

(b)

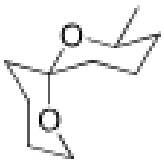


Figure 27: Option B

(c)

Figure 28: Option C

(d)

Figure 29: Option D

(GATE CY 2012)

36. For a face centered cubic lattice, the Miller indices for the first Bragg's peak (smallest Bragg angle) are

(a) 002
(c) 001
(b) 111
(d) 110

(GATE CY 2012)

37. For the titration of a 10 mL (aq) solution of $CaCO_3$, 2 mL of 0.001 M Na_2EDTA is required to reach the end point. The concentration of $CaCO_3$ (assume molecular weight of $CaCO_3$ = 100) is

(a) 5×10^{-4} g/mL
(c) 5×10^{-3} g/mL
(b) 2×10^{-4} g/mL
(d) 2×10^{-3} g/mL

(GATE CY 2012)

38. In the reaction

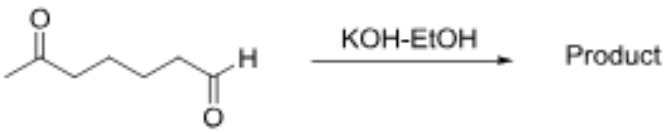
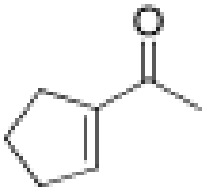


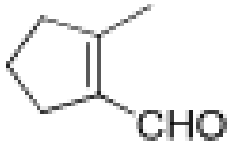
Figure 30: Figure for Q.38

the product formed is



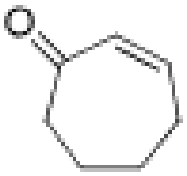
(a)

Figure 31: Option A



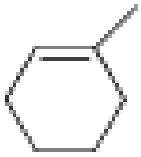
(b)

Figure 32: Option B



(c)

Figure 33: Option C



(d)

Figure 34: Option D

(GATE CY 2012)

39. In the reaction given below, identify the product

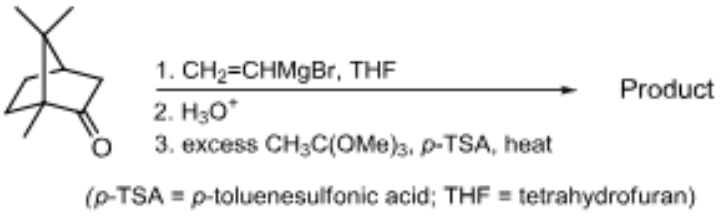


Figure 35: Figure for Q.39

(a)

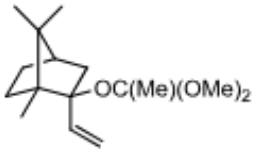


Figure 36: Option A

(b)

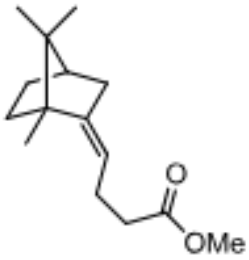


Figure 37: Option B

(c)

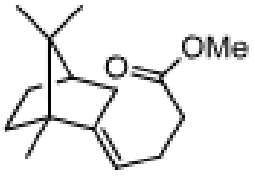


Figure 38: Option C

(d)

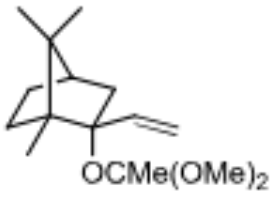


Figure 39: Option D

(GATE CY 2012)

40. Consider the following pairs of complexes

$[Co(NH_3)_5Br]^{2+}$ and $[Cr(OH_2)_6]^{2+}$ $[Co(NH_3)_5(OH)]^{2+}$ and $[Cr(OH_2)_6]^{2+}$ $[Co(NH_3)_6]^{3+}$ and $[Cr(OH_2)_6]^{2+}$

The electron transfer rate will be fastest in the pair

(a) $[Co(NH_3)_5Br]^{2+}$ and $[Cr(OH_2)_6]^{2+}$
(b) $[Co(NH_3)_5(OH)]^{2+}$ and $[Cr(OH_2)_6]^{2+}$
(c) $[Co(NH_3)_6]^{3+}$ and $[Cr(OH_2)_6]^{2+}$
(d) $[Co(NH_3)_6]^{2+}$ and $[Cr(OH_2)_6]^{2+}$

(GATE CY 2012)

41. The extent of Mössbauer quadrupole splitting of iron follows the order

(a) $FeCl_2 \cdot 4H_2O > K_2[Fe(CN)_5(NO)] > FeCl_3 \cdot 6H_2O$
(b) $K_2[Fe(CN)_5(NO)] > FeCl_2 \cdot 4H_2O > FeCl_3 \cdot 6H_2O$
(c) $FeCl_3 \cdot 6H_2O > K_2[Fe(CN)_5(NO)] > FeCl_2 \cdot 4H_2O$
(d) $FeCl_3 \cdot 6H_2O > FeCl_2 \cdot 4H_2O > K_2[Fe(CN)_5(NO)]$

(GATE CY 2012)

42. Hemoglobin is an oxygen carrying protein. The correct statement about oxy-hemoglobin is that

(a) the metal is low-spin in +3 oxidation state while dioxygen is in O_2^- form
(b) the metal is high-spin in +3 oxidation state while dioxygen is in O_2^- form
(c) the metal is low-spin in +3 oxidation state while dioxygen is in neutral form
(d) the metal is high-spin in +3 oxidation state while dioxygen is in neutral form

(GATE CY 2012)

43. If a mixture of NaCl, conc. H_2SO_4 and $K_2Cr_2O_7$ is heated in a dry test tube, a red vapour (P) is formed. This vapour (P) dissolves in aqueous NaOH to form a yellow solution, which upon treatment with $AgNO_3$, forms a red solid (Q). P and Q are, respectively

(a) CrO_2Cl_2 and Ag_2CrO_4
(b) $Na[CrOCl_5]$ and Ag_2CrO_7
(c) $Na_2[CrOCl_5]$ and $Ag_2Cr_2O_7$
(d) CrO_2Cl_2 and Ag_2CrO_7

(GATE CY 2012)

44. For the following reaction

$$2MnO_4^- + 5H_2C_2O_4 + 6H^+ \longrightarrow 2Mn^{2+} + 8H_2O + 10CO_2$$

$E^\circ(MnO_4^-/Mn^{2+})$ = +1.51 V and $E^\circ(CO_2/H_2C_2O_4)$ = –0.49 V. At 298 K, the equilibrium constant is

(a) 10^{100}
(b) 10^{148}
(c) 10^{48}
(d) 10^{143}

(GATE CY 2012) °

45. The ground states of high-spin octahedral and tetrahedral Co(II) complexes are, respectively

(a) $^4T_{2g}$ and $^4A_2$
(b) $^4T_{1g}$ and $^4A_2$
(c) $^4T_{1g}$ and $^4T_2$
(d) $^4T_{1g}$ and $^4T_1$

(GATE CY 2012)

46. The INCORRECT statement about Zeise's salt is

(a) Zeise's salt is diamagnetic
(b) The oxidation state of Pt in Zeise's salt is +2
(c) All the Pt–Cl bond lengths in Zeise's salt are equal
(d) C–C bond length of ethylene moiety in Zeise's salt is longer than that of free ethylene molecule

(GATE CY 2012)

47. The number of possible isomers for the square planar mononuclear complex $[(NH_3)_2M(CN)_2]$ of a metal M is

(a) 2
(b) 4
(c) 6
(d) 3

(GATE CY 2012)

Common Data Questions

Common Data for Questions 48 and 49: Consider the reaction sequence shown below:

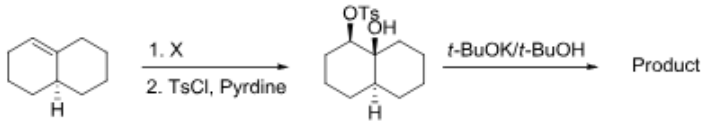


Figure 40: Figure for Q.48–49

TsCl = *p*-toluenesulfonyl chloride

48. The oxidant X used in step 1 is

(a) CrO_3

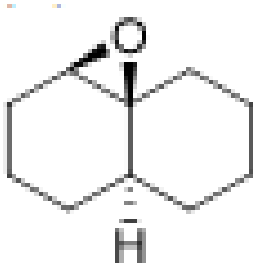
(b) OsO_4

(c) $NaIO_4$

(d) *m*-CPBA followed by NaOH

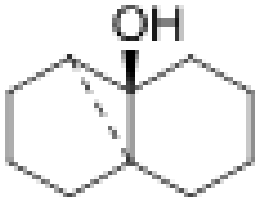
(GATE CY 2012)

49. The product is



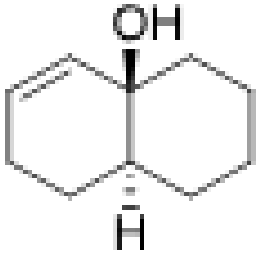
(a)

Figure 41: Option A



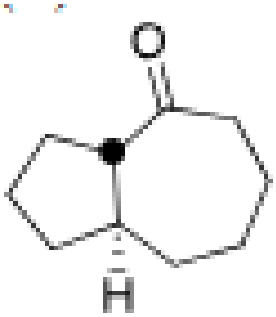
(b)

Figure 42: Option B



(c)

Figure 43: Option C



(d)

Figure 44: Option D

(GATE CY 2012)

Common Data for Questions 50 and 51: Consider the E1 reaction of *tert*-amyl halides from the energy profile given below.

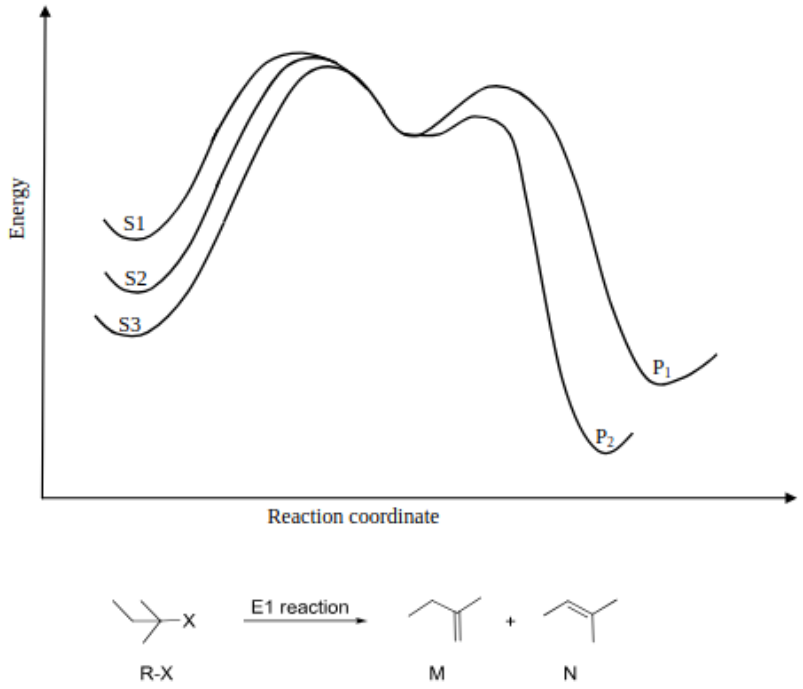


Figure 45: Figure for Q.50-51

50. In the above reaction, X = Cl, Br or I. Based on the graph, identify the alkyl halides (R–X) as S_1, S_2 and S_3.

    (a) S_1 = R–Cl, S_2 = R–Br and S_3 = R–I

    (b) S_1 = R–I, S_2 = R–Br and S_3 = R–Cl

    (c) S_1 = R–Cl, S_2 = R–I and S_3 = R–Br

    (d) S_1 = R–I, S_2 = R–Cl and S_3 = R–Br

(GATE CY 2012)

51. Identify product P_1, and its yield relative to P_2.

    (a) P_1 is M and is the major product

    (b) P_1 is N and is the minor product

    (c) P_1 is N and is the major product

    (d) P_1 is M and is the minor product

(GATE CY 2012)

Linked Answer Questions

Statement for Linked Answer Questions 52 and 53: A 20491 cm^{-1} laser line was used to excite oxygen molecules (made of ^{16}O only) to obtain the rotational Raman spectrum. The resulting rotational Raman spectrum of oxygen molecule has the first Stokes line at 20479 cm^{-1}.

52. The rotational constant (usually denoted as B) for the oxygen molecule is

(a) 1.2 cm^{-1}
(b) 2.0 cm^{-1}
(c) 3.0 cm^{-1}
(d) 6.0 cm^{-1}

(GATE CY 2012)

53. The next rotational Stokes line is expected at

(a) 20467 cm^{-1}
(b) 20469 cm^{-1}
(c) 20471 cm^{-1}
(d) 20475 cm^{-1}

(GATE CY 2012)

Statement for Linked Answer Questions 54 and 55: Hückel molecular orbital theory can be applied to the allene radical

$$CH_2 = CH - CH_2$$

54. The secular determinant (where α, β and E have their usual meanings) is given by

(a) $\begin{pmatrix} \alpha - E & \beta & 0 \\ \beta & \alpha - E & \beta \\ 0 & \beta & \alpha - E \end{pmatrix}$
(b) $\begin{pmatrix} \alpha - E & 0 & 0 \\ 0 & \alpha - E & \beta \\ 0 & \beta & \alpha - E \end{pmatrix}$
(c) $\begin{pmatrix} \alpha - E & \beta & 0 \\ \beta & \alpha - E & 0 \\ 0 & \beta & \alpha - E \end{pmatrix}$
(d) $\begin{pmatrix} \alpha - E & -\beta & 0 \\ -\beta & \alpha - E & -\beta \\ 0 & -\beta & \alpha - E \end{pmatrix}$

(GATE CY 2012)

55. The possible values of E are

(a) $\alpha + \sqrt{2}\beta$, α, $\alpha - \sqrt{2}\beta$
(b) $\alpha + 2\sqrt{2}\beta$, α, $\alpha - 2\sqrt{2}\beta$
(c) $\alpha + \beta$, α, $\alpha - \beta$
(d) $\alpha + 2\beta$, α, $\alpha - 2\beta$

(GATE CY 2012)

General Aptitude (GA) Questions (Compulsory)

Q. 56 – Q. 60 carry one mark each.

56. If $(1.001)^{129} = 3.52$ and $(1.001)^{284} = 7.85$, then $(1.001)^{4241} =$

(a) 2.23
(b) 4.33
(c) 11.37
(d) 27.64

(GATE CY 2012)

57. One of the parts (A, B, C, D) in the sentence given below contains an ERROR. Which one of the following is **INCORRECT**?

I requested that he should be given the driving test today instead of tomorrow.

(a) requested that
(b) should be given
(c) the driving test
(d) instead of tomorrow

(GATE CY 2012)

58. Which one of the following options is the closest in meaning to the word given below?

Latitude

(a) Eligibility
(b) Freedom
(c) Coercion
(d) Meticulousness

(GATE CY 2012)

59. Choose the most appropriate word from the options given below to complete the following sentence:

Given the seriousness of the situation that he had to face, his ___ was impressive.

(a) beggary
(b) nomenclature
(c) jealousy
(d) nonchalance

(GATE CY 2012)

60. Choose the most appropriate alternative from the options given below to complete the following sentence:

If the tired soldier wanted to lie down, he ___ the mattress out on the balcony.

(a) should take
(b) shall take
(c) should have taken
(d) will have taken

(GATE CY 2012)

Q. 61 – Q. 65 carry two marks each.

61. **One of the legacies of the Roman legions was discipline. In the legions, military law prevailed and discipline was brutal. Discipline on the battlefield kept units obedient, intact and fighting, even when the odds and conditions were against them.**

Which one of the following statements best sums up the meaning of the above passage?

(a) Thorough regimentation was the main reason for the efficiency of the Roman legions even in adverse circumstances.

(b) The legions were treated inhumanly as if the men were animals.

(c) Discipline was the armies' inheritance from their seniors.

(d) The harsh discipline to which the legions were subjected led to the odds and conditions being against them.

(GATE CY 2012)

62. A and B are friends. They decide to meet between 1 PM and 2 PM on a given day. There is a condition that whoever arrives first will not wait for the other for more than 15 minutes. The probability that they will meet on that day is

(a) $\frac{1}{4}$ (c) $\frac{7}{16}$

(b) $\frac{1}{16}$ (d) $\frac{9}{16}$

(GATE CY 2012)

63. The data given in the following table summarizes the monthly budget of an average household.

Category	**Amount (Rs.)**
Food	4000
Clothing	1200
Rent	2000
Savings	1500
Other expenses	1800

Table 1: Table for Q.63

The approximate percentage of the monthly budget NOT spent on savings is

(a) 10% (c) 81%

(b) 14% (d) 86%

(GATE CY 2012)

64. There are eight bags of rice looking alike, seven of which have equal weight and one is slightly heavier. The weighing balance is of unlimited capacity. Using this balance, the minimum number of weighings required to identify the heavier bag is

(a) 2
(c) 4
(b) 3
(d) 8

(GATE CY 2012)

65. Raju has 14 currency notes in his pocket consisting of only Rs. 20 notes and Rs. 10 notes. The total money value of the notes is Rs. 230. The number of Rs. 10 notes that Raju has is

(a) 5
(c) 9
(b) 6
(d) 10

(GATE CY 2012)

END OF THE QUESTION PAPER