GOVERNMENT OF KARNATAKA

DEPARTMENT OF PRE-UNIVERSITY EDUCATION

BLUE PRINT (I PUC)

(For -2021-22 academic year only)

SUBJECT: CHEMISTRY **SUBJECT CODE: 34**

TIME: 3.15MIN **MAX. MARKS: 70**

Blue Print

Group	Unit	Title	Hours	Marks	Part-A 10×1 mark	Part B 8×2 mark	Part C 8×3 mark	Part D 11×5 mark
Group-I (Physical Chemistry)	1	Some Basic Concepts of Chemistry	9	11	1	-	-	36, 37
	2	Structure of Atom	10	12	-	16	-	38, 39
	5	State of Matter: Gases and Liquids	9	10	-	-	-	40, 41
	6	Thermodynamics	11	13	2	17	-	42, 43
	7	Equilibrium	13	15	-	-	-	44, 45, 46
		Total (Group-1)	52	61	02	04	-	55
Group-II (Inorganic Chemistry)	3	Classification of Elements and Periodicity in Properties	5	6	3	18	26	-
	4	Chemical Bonding and Molecular Structure	12	14	4	19, 20	27, 28, 29	-
	8	Redox Reactions	5	6	5	21	30	-
	9	Hydrogen	4	4	6	-	31	-
	10	s-Block elements	7	08	7, 8	-	32, 33	-
	11	p-Block elements	8	09	9, 10	22	34, 35	-
		Total (Group-II)	41	48	08	10	30	-
Group-III (Organic Chemistry)	12	Some Basic Principles and Techniques	12	14	11, 12	23	-	47, 48
	13	Hydrocarbons	12	13	13	24	-	49, 50
	14	Environmental Chemistry	3	04	14, 15	25	-	-
		Total (Group-III)	27	31	05	06	-	20
		Total	**120**	**140**	**15**	**20**	**30**	**75**

Guidelines for Setting I PUC Chemistry Question Paper

1. The question paper has four parts: A, B, C and D. All parts are compulsory.
2. (a). Part-A carries 10 marks. Each question carries 1 mark. Part A (I): Frame questions from all units as required. Out of FIFTEEN questions (Question number 01 to 15), answer any TEN.
   (b). Part-B carries 10 marks. Each question carries 2 marks. Part B (II): Frame questions from all units as required. Out of TEN questions (Question number 16 to 25), answer any FIVE.
   (c). Part-C carries 15 marks. Each question carries 3 marks. Part C (III): Frame questions from Inorganic chemistry. Out of TEN questions (Question number 26 to 35), answer any FIVE.
   (d). Part-D carries 35 marks. Each question carries 5 marks.
   (i) (Part-IV) carries 25 marks: Frame questions from physical chemistry. Out of ELEVEN questions (Question number 36 to 41), answer any FIVE.
   (ii) (Part-V) carries 10 marks: Frame questions from organic chemistry. Out of FOUR questions (Question number 42 to 50), answer any TWO.
   ** A variation of ±1 mark in the unit Weightage is allowed.
3. Intermixing of questions of different units is not allowed. 5 marks question may be framed as (3+2) as far as possible.
4. Numerical problems worth of about 10 marks should be given.
5. Avoid questions from: i) Drawings involving 3D diagrams
   ii) Boxed portions of the units given in the text.
   iii) The boxed materials with deep yellow bar in the text book are to bring additional life to the topic and are non-evaluative.
6. Questions on numerical data given in the form of appendix, numbered tables containing experimental data and life history of scientists given in the chapters should be avoided.
7. In Organic chemistry R, Ar may be restricted to the groups as defined in the syllabus provided.
8. Frame the questions in such a way to strictly avoid ½ mark evaluation (or value points for ½ marks.).
9. Questions framed should not be vague and ambiguous. Avoid framing questions for which answers/ printing in the text book is not well defined/ wrong.

GOVERNMENT OF KARNATAKA

DEPARTMENT OF PRE-UNIVERSITY EDUCATION

MODEL QUESTION PAPER (I PUC)

(For 2021-22 Academic year only)

SUBJECT: CHEMISTRY **SUBJECT CODE: 34**

TIME: 3.15MIN **MAX. MARKS: 70**

INSTRUCTIONS:

1. *The question paper has four parts. All parts are compulsory.*
2. *a. Part-A carries 10 marks. Each question carries 1 mark.*
   b. Part-B carries 10 marks. Each question carries 2 marks.
   c. Part-C carries 15 marks. Each question carries 3 marks.
   d. Part-D carries 35 marks. Each question carries 5 marks.
3. *Write balance chemical equations and draw diagrams wherever necessary.*
4. *Use log tables and simple calculator if necessary (use of scientific calculator is not allowed).*

PART-A

I. Answer any ten of the following. Each question carries 1 mark. 10×1 = 10

1. Name the SI unit of amount of substance.
2. Write the relation between enthalpy change and internal energy change.
3. Which quantum number corresponds to the period number in the modern periodic table?
4. Write the Lewis dot structure of CO molecule.
5. What is the oxidation number of oxygen in peroxides?
6. What is the molecular formula for heavy water?
7. Mention one biological importance of potassium.
8. Which alkaline earth metal gives brick red colour to the flame?
9. What is the shape of Buckminster Fullerene?
10. Name the gas which forms complex carboxy haemoglobin.
11. Which gas is liberated in Dumas Process?
12. Name the first organic compound prepared in laboratory from inorganic compound by F Wohler.
13. Mention the catalyst in Friedel-craft's alkylation?
14. Write the significance of Biochemical oxygen demand (BOD).
15. What is acid rain?

PART-B

II. Answer any five of the following. Each question carries 2 marks. 5×2=10

16. Mention any two properties of cathode rays?
17. What are exothermic processes? Give an example.

18. What are Transuranium elements? Give an example.

19. The dipole moment of BeF_2 is zero. Give reason.

20. What is hydrogen bond? Mention the type of hydrogen bonding involved in *o*-nitrophenol.

21. What displacement reaction? Give an example.

22. Give reasons: i) Concentrated nitric acid transferred in aluminium container.

ii) Silicon forms p-type semi-conductor.

23. Write the bond line formula and IUPAC name of the compound o-dibromo benzene.

24. Draw the staggered conformation of ethane.

25. Name any two gases causing global warming.

PART-C

III. Answer any five of the following. Each question carries 3 marks. 5×3=15

26. Define Ionization enthalpy. How does Ionization enthalpy vary in a period & down a group in the periodic table?

27. Explain the shape of ammonia molecule using VSEPR theory?

28. What is sigma bond? Why sigma bond is stronger than pi-bond?

29. Write any three postulates of molecular orbital theory.

30. Consider the element Na, F, and I:

i) Identify the element that exhibits only negative oxidation states

ii) Identify the element that exhibits only positive oxidation state

iii) Identify the element that exhibits both positive and negative oxidation state.

31. Mention the three uses of Dihydrogen.

32. How is sodium hydroxide prepared commercially by Kastner-Kellner cell?

33. Give the chemical formula for i) Plaster of paris ii) Lime stone.

34. Write any three anomalous properties of Boron

35. Write any three differences between graphite and diamond.

PART-D

IV. Answer any five of the following. Each question carries 5 marks. 5×5=25

36. (a). Write any three postulates of Dalton's theory.

(b). Calculate the molecular mass of CO_2.

37. (a). The percentage composition of organic compound found to contains 26.66% carbon, 2.22% hydrogen and the rest is oxygen. If the molecular mass of compound is $90gmol^{-1}$, Determine the molecular formula of the compound. (Atomic mass of C, H and O are 12, 1 and 16 respectively).

(b). State Avogadro law. What is the value of Avogadro number?

38. (a). The FM station of All India Radio, Hassan, broadcast on a frequency of 1020kilohertz. Calculate the wavelength of the electromagnetic radiation emitted by transmitter.

(b). Write Rydberg's equation? Explain the terms.

39. (a). Write all possible values of l, m and s, when n=3 in an atom.

(b). Atomic number (z) and Mass number (A) of element are 29 and 64. How many protons and neutrons are present in it?

40. (a). Derive ideal gas equation?

(b). Name two types of forces which determine the physical state of substances.

41. (a). Write any three postulates of Kinetic theory of gases.

(b). Define saturated vapour pressure of a liquid. How does it vary with temperature?

42. (a). Derive the relationship between Cp & Cv for ideal gas.

(b). What is entropy? Give its SI unit.

43. (a). Calculate the standard enthalpy of formation of liquid benzene (C_6H_6). Given the enthalpies of combustion of carbon(s), hydrogen (g) and benzene (*l*) are -393.5 kJ, -285.83 kJ and -3267.0 kJ respectively.

(b). What is spontaneous change? Give one example.

44. (a). State Lechatlier's principle. What is the effect of temperature on the equilibrium when the forward reaction is exothermic?

(b). What is Homogeneous equilibrium? Give an example?

45. (a). Write any three applications of equilibrium constant (Kc or Kp).

(b). Is aqueous solution of ammonium chloride acidic? Give reason.

46. (a). Prove that pH + pOH = 14

(b). Explain common ion effect with an example.

V. Answer any two of the following. Each question carries 5 marks. 2x5=10

47. (a). How can carbon & hydrogen be estimated in the organic compound by Liebig's process?

(b). Define functional group. Write the structure of functional groups carboxylic acids?

48. (a). What are carbocations? Mention the hybridisation state of carbon and shape of CH_3^+ (methyl carbocation).

(b). How do you detect sulphur in sodium fusion extract?

49. (a). Explain the mechanism of chlorination of methane.

(b). Write the geometrical isomers of But-2-ene.

50. (a). Give the three conditions for aromaticity.

(b). How is ethyne prepared from calcium carbide? Give equation.