22CHU102N

PSG COLLEGE OF ARTS & SCIENCE

(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025

(First Semester)

Branch – **CHEMISTRY**

ANALYTICAL CHEMISTRY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	If a chemical is splashed in your eye, what is the immediate action you should take? a) Rinse it with soap b) Use oil to neutralize it c) Wash it with plenty of water d) Seek immediate medical attention	K1	CO1
	2	Choose the personal protective equipment (PPE) from the following. a) Hard hat b) Coffee mug c) Cell phone c) Stapler	K2	CO1
2	3	Find the reagent used for the spot test analysis of Ni^{2+} is a) DMG b) Thiourea c) Oxine d) Salicylaloxime	K1	CO2
	4	The dissociation of CH_3COOH will be suppressed by the addition of a) Sodium hydroxide b) Hydrochloric acid c) Potassium hydroxide d) either sodium hydroxide or potassium hydroxide	K2	CO2
3	5	Find the amount of NaOH present in 200 ml of a 0.1000 M solution? a) 0.08 g b) 0.80 g c) 8.00 g d) 0.40 g	K1	CO3
	6	Which of the following is used as an indicator in the titration of a strong acid and a weak base? a) Phenolphthalein b) Thymol blue c) Fluorescein d) Methyl orange	K2	CO3
4	7	EDTA, a multidentate ligand has how many site for binding? a) 6 b) 5 c) 4 d) 7	K1	CO4
	8	Which sentence is true about digestion? a) Produces precipitate that are difficult to filter b) Produces small precipitate c) Produces larger precipitate d) All of the above	K2	CO4
5	9	The principle involved in paper chromatography is a) Adsorption b) Partition c) Solubility d) Volatility	K1	CO5
	10	Oil and water can be separated through a) filter paper b) distillation c) evaporation d) separating funnel	K2	CO5

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	(i) Outline any five rules for the storage and handling of chemicals. (ii) Illustrate the term safe limit of vapour concentration.	K2	CO1
		(OR)		
	11.b.	(i) Summarize the various tests recommended for cleanliness. (ii) Demonstrate cleaning and maintenance of burette.		

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2	12.a.	(i) Construct the various methods for the filtration and washing of precipitates. (ii) Identify the various types of heating of a solution and transferring of residues.	K3	CO2
		(OR)		
	12.b.	Illustrate common ion effect with a suitable example.		
3	13.a.	Distinguish between primary and secondary standards. Also list the requirements for a primary standard and give 4 examples for primary standard.	K3	CO3
		(OR)		
	13.b.	Analyze the principle and theory of the acid base titrations (i) strong acid vs strong base and (ii) weak acid vs strong base.		
4	14.a.	Examine the conditions for precipitation in gravimetric analysis. Also list the advantages and disadvantages of organic precipitants.	K4	CO4
		(OR)		
	14.b.	Classify the various organic precipitants and explain the function of (i) specific and (ii) selective precipitants with suitable examples.		
5	15.a.	Discover the different types of desiccants and various methods employed for the regeneration of desiccants.	K4	CO5
		(OR)		
	15.b.	Inspect (i) steam distillation (ii) azeotropic distillation and (iii) vacuum distillation with neat sketch and suitable examples.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	(i) Examine the general precautions to be taken for avoiding accidents in laboratory. (ii) List the advantages and precautions while using standard joint apparatus. (iii) Evaluate the calibration and grading of volumetric apparatus.	K4	CO1
2	17	(i) Inspect (a) dry reactions (b) complexation reactions with suitable examples. (ii) List the spot test analysis for Ni^{2+}, Mg^{2+}, NH_4^+ and Cu^{2+}. (iii) With proper equations explain the removal of various interfering ions.	K4	CO2
3	18	(i) Explain molarity, molality and normality with mathematical expressions. (ii) Write short notes on the EDTA titrations involving zinc and nickel ions.	K4	CO3
4	19	Inspect the following in gravimetric analysis. (i) Precipitation form homogenous solution (ii) Washing and drying of precipitates (iii) Types, care and use of crucibles.	K4	CO4
5	20	Discuss the principle and applications of (i) Column chromatography and (ii) Ion exchange chromatography.	K4	CO5

Z-Z-Z END