GPCET
Pioneering Innovative Education

G.PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY::KURNOOL
(AUTONOMOUS)
ACCREDITED BY NAAC 'A' GRADE OF UGC AND NBA OF AICTE

DEPARTMENT OF HUMANITIES & SCIENCES

QUESTION BANK

SUBJECT: CHEMISTRY

UNIT: 1(Structure and Bonding Models)			
S.No	**Questions**	**Marks**	**Bloom's Level**
	2 MARKS		
1.	Define black body radiation	2	Remember
2.	Define the terms Wavelength, Frequency, Wave number and Velocity	2	Remember
3.	What is de-Broglie equation?	2	Understand
4.	Define Planck's quantum theory	2	Remember
5.	Write Schrödinger wave equation?	2	Understand
6.	Write significance of ψ and $ψ^2$	2	Understand
7.	What are bonding and anti bonding molecular orbital's?	2	Understand
8.	Define LCAO.	2	Remember
9.	Calculate bond order for O_2 & CO	2	Apply
10.	Expand the CFSE	2	Remember
11.	What is Hund's rule?	2	Remember
12.	What are the low spin and high spin complexes?	2	Understand
	10 MARKS		
1.	a) Write derivation of Schrödinger wave equation and the terms. b) Explain the significance of ψ and $ψ^2$.	5 5	Remember Apply
2.	Explain indetail the particle in one dimensional box.	10	Understand
3.	a) Mention the silent features of CFT. b) Explain with an example crystal field splitting of d-orbital in octahedral complexes.	5 5	Understand Remember
4.	Write de-Broglie equation. How the wave and particle nature of moving electrons are experimentally demonstrated?	10	Understand
5.	a) Discuss briefly about Molecular orbital theory. b) Give the Salient Features of MOT	5 5	Understand
6.	Draw the MO diagram of CO molecule; explain its magnetic nature and bond order.	10	Understand Analyze
7.	Draw the MO diagram of O_2 molecule; explain its magnetic nature and bond order.	10	Understand Apply
8.	a) Explain with an example crystal field splitting of d-orbital in tetrahedral complexes. b) Discuss the Colour and Magnetic properties of CFT complexes	5 5	Understand Analyze
9.	a) Mention the characteristics of CFT b) Explain with an example crystal field splitting of d-orbital in octahedral complexes.	5 5	Remember Understand
10.	Write in detail the dual nature of matter .	10	Remember

UNIT: 2(Electrochemistry & Applications)			
S.No	**Questions**	**Marks**	**Bloom's Level**
	2 MARKS		
1.	Derive Nernst equation? Write the terms?	2	Remember
2.	Calculate the standard electrode potential $E^0_{Cu^{2+}/Cu}$ of copper. Its electrode potential at 25^0c is 0.296v when the conc. of Cu^{2+} ion 0.015M.	2	Evaluate
3.	What are reference electrodes?	2	Remember
4.	The emf of cell Mg/Mg^{2+} 0.01 M // Cu^{2+}/Cu is found to 2.78 V at 300k. The standard electrode potential of Mg electrode -2.37V. What is the electrode potential of copper electrode?	2	Evaluate
5.	Distinguish between primary and secondary batteries.	2	Understand
6.	Mention the basic principle of photovoltaic cell.	2	Remember
7.	List the applications of Lithium ion batteries.	2	Apply
8.	What are fuel cells? Write the basic principle?	2	Remember
9.	Write limitations of methanol – oxygen fuel cell?	2	Understand
10.	Write cell reactions in hydrogen –oxygen fuel cell?	2	Remember
	10 MARKS		
1.	Using a neat diagram, explain the working of a denial cell (or) Galvanic cell. Do you use a salt bridge in this cell? If yes, explain why?	10	Remember
2.	Write a note on the followings a) Calomel electrode b) Glass electrodes.	5 5	Remember
3.	Explain construction, working and applications of photo voltaic cells.	10	Understand
4.	What are the storage batteries? Explain Lead acid battery with neat sketch.	10	Remember
5.	Define primary batteries. Explain construction, working principle & uses of Zinc-air cell.	10	Remember
6.	With a neat sketch discuss the construction ,working principle and applications of Hydrogen – oxygen fuel cell.	10	Understand
7.	Discuss with a neat sketch, the construction, working principle and applications of Methanol – oxygen fuel cell.	10	Understand
8.	Explain the working principle of a) Lithium Solid Batteries B) Lithium ion cell with neat diagrams.	5 5	Remember
9.	a)Calculate the EMF of the cell Cd/Cu^{+2} //Cd^{+2}/Cu at 25^0C. The Standard reduction potential of cadmium and copper electrodes are -0.40 and 0.34 volts respectively. b) What is Electrochemical series ? Mention its significance.	5 5	Evaluate Remember
10.	Briefly explain about alkali metal sulphide batteries with equations and a neat sketch.	10	Understand

UNIT: 3(Polymer Chemistry)			
S.No	**Questions**	**Marks**	**Bloom's Level**
2 MARKS			
1.	What is polymer? Give examples.	2	Remember
2.	Define degree of polymerisation	2	Remember
3.	What is meant by tacticity?	2	Remember
4.	Explain co-polymerisation with an example?	2	Understand
5.	What is an Elastomer? Give examples.	2	Remember
6.	Explain the vulcanisation of rubber?	2	Understand
7.	What is natural rubber? Write the formula of isoprene unit?	2	Remember
8.	Give the synthesis of Buna-S	2	Apply
9.	Define conducting polymers.	2	Remember
10.	Mention the applications of conducting polymers?	2	Apply
10 MARKS			
1.	a)Distinguish between addition and condensation polymerisation. b) Explain indetail the Cationic Mechanism in addition polymerisation.	5 5	Understand Understand
2.	What is Bakelite? Give its Synthesis. Mention its properties and uses.	10	Apply
3.	a)Write a note on Vulcanization of rubber. b)Explain in brief Compounding of rubber.	5 5	Understand Remember
4.	Describe the preparation ,properties and uses of a)Nylon 6,6 b) Buna - N	10	Remember
5.	What are conducting polymers ? How are they classified ? Mention their applications.	10	Remember
6.	a)Explain the procedure used in the processing of natural rubber. b) Differentiate the natural polymers and synthetic polymers.	5 5	Understand Remember
7.	a)Explain the differences between thermoplastics and thermosetting plastics. b)Describe the Synthesis, properties and applications of Nylons.	5 5	Analyze Understand
8.	Define conducting polymers. With polyacetylene as an example explain the mechanism and applications of n-doping polymer	10	Remember
9.	Explain the P-doping mechanism of conducting polymers with polyaniline as an example.	10	Remember
10.	Indetail explain the Free radical mechanism in addition polymerisation	10	Understand

UNIT: 4(Instrumental Methods & Applications)			
S.No	**Questions**	**Marks**	**Bloom's Level**
2 MARKS			
1.	What is spectroscopy?	2	Remember
2.	Explain the principle of UV spectroscopy and its range ?	2	Understand
3.	Distinguish Absorption and Emission spectrum.	2	Understand
4.	What is fluorescence and phosphorescence?	2	Remember
5.	Define Beer-Lambert's law.	2	Remember
6.	Write limitation of Beer-Lambert's law?	2	Understand
7.	Write the applications of UV- Visible spectroscopy?	2	Apply
8.	What is the principle of IR spectroscopy?	2	Remember
9.	Write the applications of IR spectroscopy?	2	Apply
10.	What is the principle of pH Meter? Give its applications	2	Remember
11.	Define Potentiometry.	2	Understand
12.	Define conductometry.	2	Understand
13.	What is chromatography?	2	Remember
14.	What is meant by chromophores and auxochromes?	2	Remember
15.	Define the term transmittance.	2	Remember
10 MARKS			
1.	State Beer-Lambert's law. Explain how this can be used to determine the concentration of coloured solutions.	10	Understand Apply
2.	Explain the characterisation and applications of electromagnetic spectrum.	10	Remember
3.	Explain principle, Instrumentation and applications of UV Spectroscopy with a block diagram.	10	Understand
4.	Explain principle, Instrumentation and applications of IR Spectroscopy with a neat diagram.	10	Understand
5.	Explain the various electronic transitions occur in spectroscopy.	10	Remember
6.	a) Write a brief note on Conductometric titration explaining the principle and applications b) What are potentiometric titrations? Explain with a desirable example.	5 5	Remember
7.	a) Explain indetail the principle of pH Meter. List its application b) Write a note on Thin layer chromatography	5 5	Understand Remember
8.	Define Conductance. With Stronge acid and stronge base as an example explain the conductometric titrations	10	Remember

UNIT: 5(Nano Materials & Colloidal Chemistry)			
S.No	**Questions**	**Marks**	**Bloom's Level**
2 MARKS			
1.	Define nanomaterials.	2	Remember
2.	Write applications of CNT?	2	Understand
3.	Classify the nanomaterials?	2	Understand
4.	Write applications of SEM?	2	Apply
5.	Write applications of TEM?	2	Apply
6.	What is a colloid?	2	Remembter
7.	What is lyophylic sol? Give an example.	2	Understand
8.	What is lyophobic sol? Give an example.	2	Understand
9.	Classify the colloids based on the physical state.	2	Apply
10.	Write the properties and applications of colloids?	2	Remember
10 MARKS			
1.	Explain indetail the Sol-gel method of synthesis of nano materials	10	Understand
2.	Explain construction, working procedure and applications of SEM.	10	Remember
3.	Explain construction, working procedure and applications of TEM.	10	Remember
4.	Write a note on Synthesis, Properties and uses of Fullerence.	10	Understand
5.	a) Discuss the properties and applications of colloids. b) Write a note on micelles?	5 5	Remember Understand
6.	Explain the synthesis of nanomaterials by chemical vapour deposition method with a neat sketch.	10	Remember
7.	Explain the synthesis of colloids by using Condensation methods.	10	Understand
8.	Explain the synthesis of colloids by using Dispersion methods.	10	Understand