LESSON PLAN

SUBJECT: APPLIED CHEMISTRY
SEM-2nd

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LESSON PLAN
SUB:APPLIED CHEMISTRY

Class	Theory Topics
1	COMPOSITION OF MATTER, INTRODUCTION TO ATOMIC STUCTURE, RUTHERFORD'S ATOMIC MODEL.
2	BOHR'S THEORY
3	HYDROGEN SPECTRUM EXPLANATION BASED ON BOHR'S MODEL OF AN ATOM
4	HEISENBERG'S UNCERTAINTY PRINCIPLE, ORBITAL CONCEPT AND SHAPES OF s,p,d & f ORBITALS.
5	QUANTUM NUMBERS
6	PAULI'S EXCLUSION PRINCIPLE, HUND'S RULE & AUFBAU PRINCIPLE
7	ELECTRONIC CONFIGURATION OF ELEMENTS AND IONS
8	CHEMICAL BONDING: CAUSE OF CHEMICAL BONDING AND TYPES OF BONDS. IONIC BOND (EXAMPLE OF NaCl) AND PROPERTIES OF IONIC COMPOUNDS
9	CONDITIONS FOR WRITING LEWIS DOT STRUCTURES, COVALENT BOND (H_2,F_2 ,HF, H_2O ,NH_3 ,CH_4 & CO_2) & PROPERTIES OF COOVALENT COMPOUNDS.
10	CONCEPT OF SIGMA & PIE BOND. HYBRIDISATION ($BeCl_2$, BF_3, CH_4, NH_3, H_2O)
11	CO-ORDINATION BOND (FORMATION OF NH_4^+), CONCEPT OF HYDROGEN BONDING (INTER MOLECULAR AND INTRA MOLECULAR HYDROGEN BONDING)
12	ANOMALOUS PROPERTIES OF WATER AND AMMONIA & METALLIC BONDING
13	SOLUTION: IDEA OF SOLUTE, SOLVENT & SOLUTION. METHODS TO EXPRESS THE CONCENTRATION (MOLARITY & PPM WITH NUMERICALS)
14	MASS PERCENTAGE, VOLUME PERCENTAGE & MOLE FRACTION WITH NUMERICALS.
15	QUIZ & DISCUSSION OF ASSIGNMENT QUESTIONS
16	WATER: GRAPHICAL PRESENTATION OF WATER DISTRIBUTION ON THE EARTH, CLASSIFICATION OF SOFT AND HARD WATER, SALT CAUSING HARDNESS & UNIT OF HARDNESS.
17	NUMERICALS ON HARDNESS, CAUSES OF POOR LATHERING OF SOAP IN HARD WATER. PROBLEMS CAUSED BY THE USE OF HARD WATER IN THE BOILER (SLUDGE & SCALE)
18	PRIMING, FOAMING & CORROSION
19	QUANTITATIVE DETERMINATION OF WATER HARDNESS BY EDTA METHOD, TDS & ALKALINITY ESTIMATION
20	WATER SOFTENING TECHNIQUES: SODA LIME PROCESS- COLD SODA LIME AND HOT SODA LIME PROCESS.
21	ZEOLITE PROCESS
22	ION EXCHANGE METHOD
23	MUNICIPAL WATER TREATMENT: SEDIMENTATION, COAGULATION, FILTRATION, STERILIZATION.
24	WATER FOR HUMAN CONSUMPTION FOR DRINKING AND COOKING PURPOSES FROM ANY WATER SOURCES AND INDIAN STANDARD SPECIFICATION OF DRINKING WATER.
25	QUIZ & DISCUSSION OF ASSIGNMENT QUESTIONS
26	NATURAL OCCURRENCE OF METALS – MINERALS, ORES OF IRON, ALUMINIUM AND COPPER, GANGUE (MATRIX), FLUX, SLAG & METALLURGY (DIFFERENT METHODS): PULVERISATION OF ORE

27	CONCENTRATION OF ORES (GRAVITY SEPARATION, MAGNETIC SEPARATION, FROTH FLOATATION METHOD)
28	LEACHING, CALCINATION & ROASTING
29	REDUCTION& REFINING (DISTILLATION, ELECTROREFINING & LIQUATION)
30	EXTRACTION OF IRON FROM HAEMATITE ORE USING BLAST FURNACE
31	EXTRACTION OF ALUMINIUM FROM BAUXITE ALONG WITH REACTIONS
32	ALLOYS – DEFINITION, PURPOSES OF ALLOYING, FERROUS ALLOYS AND NON-FERROUS ALLOYS WITH SUITABLE EXAMPLES, PROPERTIES AND APPLICATIONS
33	GENERAL CHEMICAL COMPOSITION & COMPOSITION BASED APPLICATIONS OF PORTLAND CEMENT AND HARDENING OF PORTLAND CEMENT.
34	COMPOSITION OF GLASS & APPLICATION OF DIFFERENT TYPES OF GLASSES. COMPOSITION & APPLICATION OF REFRACTORIES & COMPOSITE MATERIALS.
35	POLYMERS: MONOMER, HOMO AND CO POLYMERS, DEGREE OF POLYMERIZATION. CLASSIFICATION OF POLYMERS. DIFFERENCE BETWEEN THERMOPLASTIC & THERMOSETTING POLYMER.
36	METHOD OF PREPARATION& APPLICATION OF PVC, PS, PTFE, NYLON – 6 & NYLON-6,6 .
37	METHOD OF PREPARATION & APPLICATION OF BAKELITE. RUBBER & VULCANIZATION OF RUBBER.
38	QUIZ & DISCUSSION OF ASSIGNMENT QUESTIONS
39	FUEL: DEFINITION OF FUEL AND COMBUSTION OF FUEL, CLASSIFICATION OF FUELS, CALORIFIC VALUES (HCV AND LCV)
40	CALCULATION OF HCV AND LCV USING DULONG'S FORMULA
41	PROXIMATE ANALYSIS OF COAL SOLID FUEL
42	PETROL AND DIESEL - FUEL RATING (OCTANE AND CETANE NUMBERS)
43	CHEMICAL COMPOSITION, CALORIFIC VALUES AND APPLICATIONS OF LPG, CNG, WATER GAS, COAL GAS, PRODUCER GAS AND BIOGAS.
44	LUBRICATION: FUNCTION AND CHARACTERISTIC PROPERTIES OF GOOD LUBRICANT, CLASSIFICATION OF LUBRICANTS
45	LIQUID LUBRICANTS & SEMI SOLID LUBRICANTS (CLASSIFICATION & PROPERTIES)
46	SOLID LUBRICANTS (GRAPHITE & MoS_2):CLASSIFICATION & PROPERTIES
47	LUBRICATION MECHANISM – HYDRODYNAMIC AND BOUNDARY LUBRICATION, PHYSICAL PROPERTIES (VISCOSITY AND VISCOSITY INDEX)
48	PHYSICAL PROPERTIES (OILINESS, FLASH AND FIRE POINT, COULD AND POUR POINT)
49	CHEMICAL PROPERTIES (COKE NUMBER, TOTAL ACID NUMBER SAPONIFICATION VALUE) OF LUBRICANTS.
50	QUIZ & DISCUSSION OF ASSIGNMENT QUESTIONS
51	ELECTRONIC CONCEPT OF OXIDATION, REDUCTION AND REDOX REACTIONS. DEFINITION OF TERMS: ELECTROLYTES, NON-ELECTROLYTES WITH SUITABLE EXAMPLES
52	FARADAYS LAWS OF ELECTROLYSIS AND SIMPLE NUMERICAL PROBLEMS
53	INDUSTRIAL APPLICATION OF ELECTROLYSIS – ELECTROMETALLURGY,ELECTROPLATING & ELECTROLYTIC REFINING
54	APPLICATION OF REDOX REACTIONS IN ELECTROCHEMICAL CELLS: PRIMARY CELLS OR DRY CELL & SECONDARY CELL - COMMERCIALLY USED LEAD STORAGE BATTERY
55	FUEL CELL & SOLAR CELL

56	CORROSION: DEFINITION, CAUSES & TYPES OF CORROSION (DRY CORROSION)
57	ELECTROCHEMICAL CORROSION: H_2 LIBERATION AND O_2 ABSORPTION MECHANISM OF ELECTROCHEMICAL CORROSION.DIFFERENCE BETWEEN CHEMICAL &ELECTROCHEMICAL CORROSION.
58	FACTORS AFFECTING RATE OF CORROSION.
59	INTERNAL CORROSION PREVENTIVE MEASURES: PURIFICATION, ALLOYING AND HEAT TREATMENT AND EXTERNAL CORROSION PREVENTIVE MEASURES: A) METAL (ANODIC, CATHODIC) COATINGS, B) ORGANIC INHIBITORS.
60	QUIZ & DISCUSSION OF ASSIGNMENT QUESTIONS

Signature of the faculty

Signature of the H.O.D