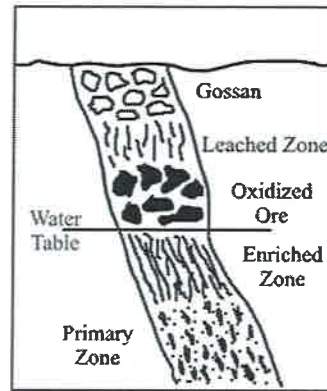


9

Q.P Code 00051563

1A	<p>Fill in the blanks</p> <ol style="list-style-type: none"> i. Iron ii. archaen iii. gold iv. eluvial v. replacement vi. chalcopyrite vii. pyrite viii. dolomite, graphite, fireclay, etc ix. Zinc x. early magmatic dissemination 	10*1=10
1B	<p>Define the following:</p> <ol style="list-style-type: none"> i. host rock for diamond, alkaline magma ii. Skarn An assemblage of high temperature metamorphic gangue minerals in contact metasomatic deposits is called iii. Strategic minerals: To the extent that these minerals are important in various industrial processes, they are regarded as critical or strategic minerals. Some examples of strategic minerals are tin, silver, cobalt, manganese, tungsten, zinc, titanium, platinum, chromium, bauxite, and diamonds. iv. epithermal deposits: Hydrothermal deposits, which are formed at medium pressure, and within the Temperature range of 50°C to 200°C v. Gossan: iron rich capping in oxidation zone vi. Fumaroles: A fumarole is an opening in a planet's crust, often in areas surrounding volcanoes, which emits steam and gases such as carbon dioxide, sulfur dioxide, hydrogen chloride, and hydrogen sulfide. vii. Tenor of an ore: percent of the metal content of ore viii. Non metallic minerals: coal, limestone, gypsum ix. Phosphates (apatite, phosphorite), nitrates (saltpetre, soda nitre) x. overburden unwanted rock which have to be removed to get a mine 	10*1=10
2	<p>Answer any two of the following:</p> <ol style="list-style-type: none"> a) Physical characters, permeability, brittleness, grain size, chemical composition, presence of reactive minerals, etc Structural: regional, local, joints, faults, foliation, shears, joints 5 marks for each detailed description b) Stratabound: Stratabound ore deposits are any type of ore bodies, concordant or discordant, which are restricted to a particular stratigraphic horizon., stratiform deposits; following bed Pegmatites are extreme igneous rocks that form during the final stage of a magma's crystallization. They are extreme because they contain exceptionally large crystals and they sometimes contain minerals that are rarely found in other types of rocks. (5 marks for each) 	2*10=20

	<p>c) A metallogenic province is a notable concentration of deposits of a certain metal or metals within a large region or belt with one of its dimensions reaching as much as 1000 km or more. precambrian deposits are of iron, chromite, copper, manganese, gold, lead etc</p> <p>d) Those which consist of minerals crystallizing from a magma towards the close of magmatic period. They are always associated with mafic igneous rocks.</p> <p>The late magmatic deposits have resulted from:</p> <ol style="list-style-type: none"> Variations of crystallization differentiation. Gravitative accumulation of heavy residual liquids. Liquid separation of sulfide droplets. 4 for description+ 2 each process) 	
3	<p>Answer any two of the following:</p> <ol style="list-style-type: none"> Residual deposits (presence of valuable minerals, warm humid climatic conditions, decay, low relief, long crustal stability, etc) detailed description of any four type fissure vein, stock work, saddle reef, ladder veins, pitches, solution cavity, etc) 2 ½ for each Explain the role of metamorphism in the formation of the mineral resources. Give example for the same.(7 description+ 3 marks for example) a placer deposit is an accumulation of valuable minerals formed by gravity separation from a specific source rock during sedimentary processes. Alluvial placer formed by river by weathering and then accumulation (10 marks for complete description) 	2*10=20
4	<p>Answer any two of the following:</p> <ol style="list-style-type: none"> Write a note on iron gossans and their significance in identification of the hidden deposits. (iron rich capping; Brown, maroon, orange signify Cu, yellow and brick red pyrite, ochreous orange galena, tan to brown sphalerite, tan to maroon molybdenite, etc 5 for description and 5 for correct identification Describe the primary requisites for the formation of supergene enrichment deposits Oxidation, suitable primary minerals, rock permeability, absence of precipitants in oxidised zone, no oxygen in sulphide deposition zone, hypogene minerals below water table Discuss in detail the various factors that control the process of oxidation (rise and fall of water table, climate, time, physical and chemical properties of the rock, structural features) 1 ½ for each factor With reference to the oxidation and supergene sulphide enrichment describe the various changes that take place in the supergene sulphide zone with a neat diagram. Sulfide minerals are oxidized at the surface and produce sulfuric acid, and acidified rainwater then carries the copper, as copper sulfate, down to the water table. Below the water table, where sulfide minerals remain unoxidized, any iron sulfide grains present will react with the copper sulfate solution, putting iron into solution and precipitating a copper mineral. The net result is that copper is transferred from the oxidizing upper portion of the deposit to that portion at and just below the water table. 	2*10=20



5	<p>Answer any four of the following:</p> <p>a) Enumerate the most common minerals found in the oxidation zone</p> <p>Copper: malachite, azurite, chrysocolla Gangue minerals: quartz (usually cryptocrystalline), baryte, calcite, aragonite Iron: goethite, hematite Lead: anglesite, cerussite Manganese: pyrolusite, romanechite, rhodochrosite Nickel: gaspeite, garnierite Silver: native silver, chlorargyrite Zinc: smithsonite (1 for each)</p> <p>b) Discuss the factors that yield mineral deposits by the process of evaporation. Enumerate the minerals formed due to evaporation. (evaporation, arid climate, salt content, restricted setting, gypsum, halite, anhydrite,)</p> <p>c) Manganese in Balaghat , MP, 40% of Mn, gondite type of deposits, associated with granites and gneisses.</p> <p>d) Presence of unsupported residual, preservation of rock structure, doubly terminated crystals, Mineral pseudomorp, irregular outline of ore, absence of crustification</p> <p>e) Abrasive minerals: An abrasive is a material, often a mineral, that is used to shape or finish a workpiece through rubbing which leads to part of the workpiece being worn away by friction</p> <p>f) Sulphur, borax, sodium chloride etc deposited by volcanoes, thermal springs and fumaroles</p>	4*5=20
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