


Name:	 UPES UNIVERSITY OF TOMORROW
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Ore & Mining Geology
Program: M.Sc Petroleum Geoscience
Course Code: PEGS 7015

Semester: II
Time : 03 hrs.
Max. Marks: 100

Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Discuss the various sources of hydrothermal fluid in increasing order of importance	04	CO1
Q 2	Differentiate between PL & RP	04	CO2
Q 3	i. Kimberlite deposits are examples of ----- deposit ii. In an open pit mine, line joining bottom most toe & top most crest forms ----- iii. Probable reserve is a part of -----reserve iv. Identification based on physical & chemical properties known as -----	04	CO1
Q 4	i. Reserve ready for immediate exploitation is termed as ----- ii. Placer mining is otherwise known as ----- iii. Vertical access from top to bottom in Underground mine is known as ----- iv. Bauxite is an example of ----- deposit	04	CO1
Q 5	Mark True/ False i. Fixed cost remains same throughout the entire operation cycle ii. Commissioning stage is followed by start-up stage iii. Placer deposits can be of residual origin iv. Error in estimating the Probable reserve is 30-50%	04	CO1

SECTION B
(4Qx10M= 40 Marks)

Q 6	Analyse the role of scale and how will it differ for a) Reconnaissance, b) Prospecting, c) General Exploration and d) Detailed Exploration?	10	CO2
Q 7	i. Does carbonization is related to coal maturity, if yes, how? ii. Establish the interdependency between tenor, grade & cut-off grade iii. Nugget Effect is bias/ blessing in sampling, analyze iv. Grab vs Bulk sampling, analyse the accuracy in terms of accuracy v. Differentiate between Alternate & Fractional shoveling	2*5=10	CO3
Q 8	A copper vein of uniform thickness found at a depth of 100 mtrs. Vein width at the top is 60 mtrs. Ass ay values are 15 & 9 respectively. Calculate the average assay of the deposit	10	CO3

Q 9	<p>List the common ore minerals of Copper. With suitable sketch, illustrate the formation of copper oxide and sulphide minerals.</p> <p>OR</p> <p>List down the mandatory factors to be considered while selecting the mining method with due justification.</p>	10	CO3																																								
SECTION-C (2Qx20M=40 Marks)																																											
Q 10	<p>Given area of entire pit=3600sq. mtrs, Assume each pit is of rectangular shape & is of equal area. Density of Iron: 1.28t/m³, Density of Mn: 1.12t/m³. Calculate the average grade of the area.</p> <table border="1" data-bbox="228 646 1175 779"> <tr> <td data-bbox="228 646 667 709">Fe (height of pit-4mtrs, 1.4% Fe)</td> <td data-bbox="672 646 1175 709">Fe (height of pit-3.4mtrs, 1.2% Fe)</td> </tr> <tr> <td data-bbox="228 709 667 779">Mn (height of pit-3.4mtrs, 2.7% Fe)</td> <td data-bbox="672 709 1175 779">Mn (height of pit-4mtrs, 3.2% Fe)</td> </tr> </table>	Fe (height of pit-4mtrs, 1.4% Fe)	Fe (height of pit-3.4mtrs, 1.2% Fe)	Mn (height of pit-3.4mtrs, 2.7% Fe)	Mn (height of pit-4mtrs, 3.2% Fe)	20	CO4																																				
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Q 11	<p>Elaborate the Reserve classification based upon Indian standard. Using the same, classify the following deposit</p> <p>There is a copper deposit in Jharkhand. Out of the total area of influence, almost 1/4 area is confirmed to be a reserve in all respect. In that 1/4th area, some portions are non-yielding at this point of time. 2/4th of the left out area can be categorized as Reserve based upon the borehole information/ Exploratory drill. The information is adequate to take investment decision. The left out 1/4th area had recently subjected to initial exploration but has potential.</p> <p>OR</p> <p>There is a Pb deposit, which evaluated based upon 7 boreholes. Find out the average grade of the deposit. The details are as follows</p> <table border="1" data-bbox="358 1346 1045 1738"> <thead> <tr> <th>Sample location</th> <th>Thickness (mtrs)</th> <th>Area (ft²)</th> <th>Tonnage Factor</th> <th>grade</th> </tr> </thead> <tbody> <tr> <td>B-1</td> <td>150</td> <td>5320</td> <td>10</td> <td>1.21</td> </tr> <tr> <td>B-2</td> <td>135</td> <td>5300</td> <td>10</td> <td>0.97</td> </tr> <tr> <td>B-3</td> <td>?</td> <td>4400</td> <td>10</td> <td>?</td> </tr> <tr> <td>B-4</td> <td>175</td> <td>5520</td> <td>10</td> <td>0.75</td> </tr> <tr> <td>B-5</td> <td>155</td> <td>6800</td> <td>10</td> <td>0.82</td> </tr> <tr> <td>B-6</td> <td>180</td> <td>4960</td> <td>10</td> <td>0.66</td> </tr> <tr> <td>B-7</td> <td>?</td> <td>4520</td> <td>10</td> <td>?</td> </tr> </tbody> </table> <p>The max. depth up to which, deposit is encountered is 300. The information for Borehole 7 is as follows.</p> <p>Each section is at an interval of 50. The respective grade for each section is</p>	Sample location	Thickness (mtrs)	Area (ft ²)	Tonnage Factor	grade	B-1	150	5320	10	1.21	B-2	135	5300	10	0.97	B-3	?	4400	10	?	B-4	175	5520	10	0.75	B-5	155	6800	10	0.82	B-6	180	4960	10	0.66	B-7	?	4520	10	?	20	CO4
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0.4, 0.9, 1.2, 1, 1.7 & 1.1 of Pb.

For Bore hole 3, the information is as follows-

Thickness	Grade
0-50	0.3
50-100	0.7
100-150	0.5
150-180	1
180-250	0.7
250-300	0.8

Cut-off grade is **0.7%** of Pb