

Name:	
Enrolment No:	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**

**End Semester Examination, December- 2018**

**Programme Name: B. Tech, Mining Engg**

**Semester: V**

**Course Name: Mineral Processing Technology**

**Time: 03 hrs**

**Course Code: GESG 316**

**Max. Marks: 100**

**Nos. of page(s):02**

**SECTION A (20 Marks)**  
**All questions are compulsory**

S. No.		Marks	CO
Q 1	Differentiate between free & hindered settling process in hydrocyclone?	<b>05</b>	<b>CO4</b>
Q 2	List down the coal preparation techniques?	<b>05</b>	<b>CO5</b>
Q 3	Interpret the effect of sorting & mineral assemblage on mineral processing?	<b>05</b>	<b>CO3</b>
Q 4	Distinguish role of different lenses at various stages of SEM?	<b>05</b>	<b>CO1</b>

**SECTION B (40 Marks)**

**First two questions are compulsory & attempt any 1 from Q 7**

Q 5	a) From industry point of view, why WHIMS is superior to dry HMS? b) It is known that WHIMS is equally efficient process to Flotation. Defend why WHIMS is not used in spite of its efficiency?	<b>5+5</b>	<b>CO2</b>
Q 6	a. What is metacaptane? b. Why non-polar minerals are hydrophobic? c. Why excess of collector reduces flotation efficiency? d. Arrange the minerals as per their decreasing hydrophilicity e. Which property of frother governs its efficiency f. Explain work of adhesion? g. What are the two fundamental principles behind flotation? h. Differentiate between mechanical & column flotation cell i. How xanthates are manufactured? j. What are the various types of regulators?	<b>2*10= 20</b>	<b>CO1</b>
Q 7	Vertical compartmentalization of hydrocyclone is governed by physical properties of minerals. Critically examine & support your argument  <p style="text-align: center;"><b>OR</b></p> Explain role of density in Baum jig during coal washing?	<b>10</b>	<b>CO3</b>

**SECTION-C (40 Marks)**  
**Q 8 is compulsory & attempt any 1 from Q 9**

Q 8	<p>End user: Sinter plant  Sample: Mixture of Lumps and Fines  Fe: 45%  Composition: Fe<sub>2</sub>O<sub>3</sub>, Fe (OH)<sub>2</sub> along with silica  Density of haematite=4.2, Quartz=2.8 and Goethite=3.3  Identify all the possible processes and justify which process is the best suitable process in order to feed the Steel Plant?</p>	<b>20</b>	<b>CO6</b>
Q 9	<p>How hydrophobicity and contact angle are inter-dependent in Mineral Processing?  Deduce the equation establishing the relationship</p> <p style="text-align: center;"><b>OR</b></p> <p>Sulphydryl collectors are ineffective in flotation of oxides of Copper. Appraise reasons for this condition?  Suggest the recourse measure needs to be taken for the same?</p>	<b>20</b>	<b>CO5</b>
		<b>10+10</b>	

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**SECTION A (20 Marks)**  
**All questions are compulsory**

S. No.		Marks	CO
Q 1	Differentiate between hydraulic & mechanical classifiers?	05	CO4
Q 2	Discuss the various techniques used in coal processing?	05	CO5
Q 3	How interlocking of mineral grains affects efficiency in mineral processing?	05	CO3
Q 4	How Diffraction & Fluorescence are important in Mineral Quality Analyses?	05	CO1

**SECTION B (40 Marks)**

**First three questions are compulsory & attempt any 1 from Q 8**

Q 5	Coal Preparation includes washing? How density plays a major role in coal washing?	10	CO5
Q 6	a. What is FEG? b. What are the two functions of thickener? c. What is the effect of entrainment in flotation? d. Differentiate between Baum and Batac jig? e. What is the dual function of depressant?	2*5= 10	CO1
Q 7	Examine the effect of sorting, mineral assemblage on mineral processing	10	CO3
Q 8	What is Envelope of zero vertical velocity? How particles behave in this zone and compare their behavior in the zones above and below?  <b>OR</b>  Deduce the equation for co-efficient of friction for Rod Mill? Find out the maximum particle size of feed against data given below? Roll Diameter: 1mm, Nip Angle: 31degree, Distance between crushing surface is 12.5 mm	10	CO2

**SECTION-C (40 Marks)**

**Q 8 is compulsory & attempt any 1 from Q 10**

Q 9	For a given Coal mine, the information given is as follows: The End User will be a Steel Plant. Coal sample is a mixture of lumps & fines containing around 25% of ash. The Mine is located in tropical area. Suggest the best possible ways treat Coal in order to feed the Steel Plant	<b>20</b>	<b>CO6</b>
Q 10	Deduce the equation for work of adhesion. Using adhesion equation, find out how bubble stability is maintained?	<b>10+10</b>	<b>CO5</b>
	OR  List types of regulators and Justify role and applications in floatation?	<b>20</b>	