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## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, April / May 2018

Program: B.Tech Mining

Subject (Course): Risk Management in Sub-Sea Polymetallic Nodules

Course Code : MIEG 452

Semester – VIII

Max. Marks: 100

Duration : 3 Hrs

### SECTION – A COMPULORY [20 Marks]

S.No		Marks	CO
Q.1	Name the four major occurrences where manganese nodules occur in significant abundances.	[4]	CO2
Q.2	Distinguish between Hydrogenous process and Diagenetic process.	[4]	CO3
Q.3	How many licenses have been awarded for polymetallic nodule mining and for which countries?	[4]	CO4
Q.4	Explain why are constant flow of water and low sedimentation rates require for the formation of manganese nodules?	[2×2]	CO3
Q.5	Explain the term economic rent.	[4]	CO5

### SECTION – B [40 Marks]

Q.6	What is capital Asset Pricing Model and what is its importance?	[10]	CO4
Q.7	Describe the technology risk in relation to seabed mining	[10]	CO4
Q.8	A sea bed manganese nodule mining project requires an initial investment of \$225,000 and is expected to generate the following net cash inflows: Year 1: \$95,000 Year 2: \$80,000 Year 3: \$60,000 Year 4: \$55,000	[10]	CO4

Compute Net Present Value of the project if the cost of capital is considered as 12% and also take your decision whether the project is economically viable or not.

- Q.9** Describe the process to go for prospecting of deep seated polymetallic nodules. [10] CO5

OR,

What are the information that need to be included in the annual report which are submitted to the authority by the contractor for polymetallic nodules exploration?

**SECTION –C**  
**[40 Marks]**

- Q.10** (a) What are the “Rights” awarded in the contract for exploration of polymetallic nodules. [10+5+5] CO5  
(b) Elaborate the Relinquishment process in case of exploration for polymetallic nodules.  
(c) What are the measures to be taken for preservation and protection of the marine environment by the contractor for deep seated polymetallic nodule exploration.

- Q.11** (a) A Manganese nodule mining project requires an initial investment of \$225,000 and is expected to generate the following net cash inflows. [10+10] CO6  
Year 1 : \$95,000  
Year 2 : \$80,000  
Year 1 : \$60,000  
Year 1 : \$55,000

Compute NPV of the project and take a decision whether to invest in the project or not considering the cost of capital as 12%.

- (b) An investment of \$200,000 in the Manganese nodule mining is expected the following cash inflows in six years.

Year 1 : \$70,000  
Year 2 : \$60,000  
Year 3 : \$755,000  
Year 4 : \$40,000  
Year 5 : \$30,000  
Year 6 : \$25,000

Compute the Pay Back Period of the investment. Should the investment be made if mining company wants to recover the initial investment in 3 years or less?

OR ,

A mining company uses the IRR to evaluate investment opportunities and need to make a decision regarding the viability of a project, the details of which is given below considering the initial investment as \$10,000 and the cost of capital or the discount rate as 12%

[20]

<b>Year</b>	<b>Cash Flows</b>
1	\$4,000
2	\$6,000
3	\$8,000
4	\$7,000
5	\$4,000

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