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UNIVERSITY OF PETROLEUM & ENERGY STUDIES

End Semester Examination, December 2019

Program/course: MBA (OG)
Subject: Fundamental of Petroleum Exploration
Code : OGOG7002
No. of page/s: 2

Semester – I
Max. Marks: 100
Duration : 3 Hrs.

Note: All sections are compulsory.

SECTION A (5 x 4 =20 Marks)

Note: All sections are compulsory.

S. No.		Marks	CO
Q 1	Describe the Jurassic age and its significance in geological time scale/ record? Arrange the following Eras in order of superposition and indicate the age in millions years a. Mesozoic b. Archean c. Proterozoic	5	CO1, CO2
Q 2	Draw the <i>Rock Symbol</i> for each of the following rock types. a. Conglomerate b. Sandstone c. Shale d. Limestone e. Basement	5	CO1, CO2
Q 3	Draw the <i>Well Symbol</i> against each of the followings Well type. a. Dry Well b. Abandoned well c. Oil Well d. Dry Well with Gas Show	5	CO1, CO2

	e. Appraisal Well		
Q 4	Write the unit for each of the following property f. Pressure... g. Acoustic Velocity... h. Gravity Measurement... i. Permeability j. Magnetic Intensity	5	CO1, CO2

SECTION B (5X4 = 20 Marks)

Note: Attempt any of the four questions

Q 5	Describe the deep-water exploration status in India. Where are the major fields discovered?	5	CO4
Q 6	Describe natural oil seeps and their significance in hydrocarbon exploration. How you distinguish <i>natural oil seep from man-made sources such as oil tankers</i>	5	CO3, CO4
Q 7	Describe the CBM and Gas Hydrate as unconventional hydrocarbon resource and their potential in India	5	CO2
Q 8	Describe Map Projection and the various projection geometries used in mapping geological structures	5	CO3, CO4
Q 9	Describe the types of drilling Rigs used in onshore and offshore basins. What is the significance of FPSO?	5	CO3, CO4

SECTION-C (10x3 = 30 Marks)

Note: Attempt any three questions

Q 10	Describe the new changes made in petroleum licensing policy by Govt. of India. Explain the National Data Repository (NDR)	10	CO1, CO2
Q 11	Describe the petroleum system elements and their interdependence. Define the Geologic Chance Factor (Pg) and estimation of Risk associated with the exploration projects	10	CO4, CO5
Q 12	Describe the Seismic method for hydrocarbon exploration and why 3D Seismic has become the most important technique in successful petroleum Exploration & production.	10	CO2, CO4
Q 13	Explain the diagenetic and catagenetic processes in transformation of organic source rock in to petroleum. What are the main category of source rocks and their petroleum type generation potential?	10	CO2

SECTION-D (10x3 = 30 Marks)

Note: All questions are compulsory

Q 14	Describe the classification of Resource and Reserves in petroleum as per the WPC/SPE/AAPG. Define the deterministic and probabilistic distribution used in their classification.	10	CO4, CO5																																																																																							
Q 15	Describe the classical <i>volumetric equation for oil-in-place</i> . Also, calculate the six values of Reserves necessary to draw the tornado chart for the three-parameter system, using the following input values, draw the <i>Tornado chart</i> . <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Parameters (Units)</th> <th>Best</th> <th>Worst</th> <th>Most-likely</th> </tr> </thead> <tbody> <tr> <td>A-Area (acres)</td> <td align="center">600</td> <td align="center">400</td> <td align="center">500</td> </tr> <tr> <td>H-Net Pay (ft)</td> <td align="center">80</td> <td align="center">60</td> <td align="center">70</td> </tr> <tr> <td>R-Recovery factor (STB/ac-ft)</td> <td align="center">100</td> <td align="center">50</td> <td align="center">75</td> </tr> </tbody> </table>	Parameters (Units)	Best	Worst	Most-likely	A-Area (acres)	600	400	500	H-Net Pay (ft)	80	60	70	R-Recovery factor (STB/ac-ft)	100	50	75	10	CO4, CO5																																																																							
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Q 16	Explain the economic indicators such as NPV, IRR and P/I ration in Oil & Gas projects. Complete the following discounted cash flow table. Calculate the cumulative cash flow and profitability indicator such as P/I Ratio. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Year</th> <th rowspan="2">Net Cash (\$MM)</th> <th rowspan="2">Cumulative Cash Flow (\$MM)</th> <th colspan="3">Discounted Cash Flow at...</th> </tr> <tr> <th>5%</th> <th>10%</th> <th>20%</th> </tr> </thead> <tbody> <tr> <td>1995</td> <td align="center">-200</td> <td align="center">-200</td> <td align="center">-200</td> <td align="center">-200</td> <td align="center">-200</td> </tr> <tr> <td>1996</td> <td align="center">-60</td> <td align="center">-260</td> <td align="center">-248</td> <td align="center">-236</td> <td align="center">-217</td> </tr> <tr> <td>1997</td> <td align="center">35</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1998</td> <td align="center">100</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1999</td> <td align="center">130</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2000</td> <td align="center">150</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2001</td> <td align="center">160</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2002</td> <td align="center">140</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2003</td> <td align="center">110</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2004</td> <td align="center">80</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2005</td> <td align="center">50</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Totals</td> <td align="center">695</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P/I Ratio</td> <td></td> <td align="center">-----</td> <td align="center">----</td> <td align="center">-----</td> <td align="center">-----</td> </tr> </tbody> </table>	Year	Net Cash (\$MM)	Cumulative Cash Flow (\$MM)	Discounted Cash Flow at...			5%	10%	20%	1995	-200	-200	-200	-200	-200	1996	-60	-260	-248	-236	-217	1997	35					1998	100					1999	130					2000	150					2001	160					2002	140					2003	110					2004	80					2005	50					Totals	695					P/I Ratio		-----	----	-----	-----	10	CO4, CO5
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