UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: **Data Analytics & O&G Applications**   **Semester: IV**
Program: MBA Oil & Gas Management   **Time: 03 Hours**
Course code: OGOG 8003   **Max. Marks: 100**
Instructions:

SECTION A

Elaborate upon the given distributions with examples and relevant expressions		Marks	CO
Q 1	Elaborate upon the given distributions with examples and relevant expressions: 1. Binomial 2. Poisson 3. Exponential 4. Geometric	4*4=16	3
Q 2	Write Short notes on: 1. Prescriptive Analytics 2. Predictive Analytics	4*2=8	3
Q 3	Interaction Variables	5	5
	SECTION B		
Attempt the below Questions			
Q 4	What is '**Degree of Freedom**'? How does it affect the calculation of '**Standard Deviation**'?	5	1,3
Q 5	Let's assume that you invest in Company XYZ stock, which has returned an average 10% per year for the last 10 years. How risky is this stock compared to, say, Company ABC stock, which also has an average return of 10%?	5	2

Year	Return (Company XYZ)	Return (Company ABC)
1	5%	8%
2	-15%	10%
3	35%	9%
4	0%	10%
5	25%	10%
6	-10%	12%
7	50%	9%
8	5%	10%
9	10%	9%
10	-5%	12%
Average	**10%**	**10%**

Q 6	What is the "**Finite Population Correction Factor**"? Elaborate the rationale for its usage.	5	1,3

SECTION-C

Attempt the below Questions

Q 7	Detail the major parameters to be monitored to avoid a drilling operation failure.	12	4,5
Q 8	What are the prominently used **Measures of Central Tendency**? In what situations should they be used?	10	2,3
Q 9	The frequency distribution of shoe sizes for a sample of 21 women was collected and is summarised in below table. Find the Average Shoe Size	5	4

Shoe Size	Frequency
4	5
5	6
6	7
7	2
8	1
Total	21

Q 10 Below is the Regression output of data - Sales achieved (Y) & TV Ad Spends (X) – over various Quarters.

SUMMARY OUTPUT

Regression Statistics
Multiple R	0.9027
R Square	0.8148
Adjusted R Sq	0.8016
Standard Error	148.1904
Observations	16

ANOVA
	df	SS	MS	F	Significance F
Regression	1	1,352,635.29	1,352,635.29	61.59	0.00000171
Residual	14	307,445.65	21,960.40		
Total	15	1,660,080.94			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	437.8799	82.3477	5.3175	0.0001	261.2617	614.4981	261.2617	614.4981
$ TV ads	16.9448	2.1591	7.8482	0.0000	12.3141	21.5756	12.3141	21.5756

4

6

	1) Write down the Regression Equation (Model) achieved? What all does this model tell you?
	2) What is indicated by the following:
	   a) Intercept.
	   b) Coefficients and their signs.
	3) What is Multiple R? What relationship between Y & X does the Multiple-R value indicate in the above output?
	4) Interpret the resulting R-Square value in context.
		5
		5
		5
		5	

Q 11	What are the *p-stat* & *Significance F* in a Regression output? How are they similar? How are they different?	**8**	**2**

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SECTION A

Elaborate upon the given distributions with examples and relevant expressions	Marks	CO
Q.1.	Z Value	5	1
Q.2.	Correlation	5	1
Q.3.	Percentile	5	1
Q.4.	Mode	5	1
Q.5.	Adjusted R^2	5	3
Q.6.	Scatter Plot	5	1

SECTION B

Attempt the below Questions

Q.7. Below is the Regression output of data - Sales achieved (Y) & TV Ad Spends (X) – over various Quarters.

SUMMARY OUTPUT

Regression Statistics	
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ANOVA

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Intercept	437.8799	82.3477	5.3175	0.0001	261.2617	614.4981	261.2617	614.4981
$ TV ads	16.9448	2.1591	7.8482	0.0000	12.3141	21.5756	12.3141	21.5756

[Marks column: 4]

5) Write down the Regression Equation (Model) achieved? What all does this model tell you? **6**
6) What is indicated by the following:
  a) Intercept. **5**
  b) Coefficients and their signs. **5**
7) What is Multiple R? What relationship between Y & X does the Multiple-R value indicate in the above output? **5**
8) Interpret the resulting R-Square value in context. **5**

Q.8.	How can **t-stats** and **p-values** (the results of regression run on data) be helpful in deciding the independent variables of a regression model?	**10**	**4**
Q.9.	In what scenarios are 'Box Plots' useful ways of data representation?	**10**	**4**
Q.10.	The frequency distribution of shoe sizes for a sample of 21 women was collected and is summarised in below table. Find the Average Shoe Size Shoe Size Frequency 4 5 5 6 6 7 7 2 8 1 Total 21	**4**	**5**
	SECTION-C		
Q.11.	Discuss how Advance AI and Analytics assist in Reservoir Management.	**20**	**4,5**