

Name:

Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**Online End Semester Examination, May 2020**

**Course: Supply Chain Analytics**  
**Program: MBA LSCM (III)**  
**Course code: LSCM 8020**

**Semester: III**  
**Time: 03 hrs.**  
**Max. Marks: 100**

**SECTION A**

- 1. Each Question will carry 5 Marks**
- 2. Instruction: Complete the statement / Select the correct answer(s)**

S.No	Question	CO
Q 1	In R programming, the test for normality of a continuous variable can be done by using _____ function and its p-value should be _____.	CO1
Q 2	a) Spearman's and Kendall's correlation coefficients are non-parametric alternatives to Pearson's correlation coefficient. <b>(TRUE/FALSE)</b> b) _____ is the symbol for Spearman's rank correlation in R.	CO2
Q 3	Reliability analysis for a factor can be calculated in R using _____ function through the _____ package. The range of alpha value is from _____ to _____. The reliability analysis can also be analyzed using SPSS stands for _____.	CO3
Q 4	Which of the following is <b>NOT</b> an assumptions of Linear Discriminant Analysis (LDA)? a) Homogeneity of variance b) Univariate normality c) Data should be measured on a ratio or interval scale d) Data should not contain outliers e) Low value of Wilk's Lambda shows significance level	CO3
Q 5	_____ uses block chain technology as its transaction ledger. a) Bitcoin b) Cryptocurrencies c) Artificial Intelligence d) Machine Learning e) Cryptography f) Security Technologies	CO4
Q 6	IDIC Model indicates _____ and CPFR stands for _____	CO4

**SECTION B**

- 1. Each question will carry 10 marks**
- 2. Instruction: Write short / brief notes**

Q 7	How supply chain using analytics to solve the problem? List down the software used for supply chain analytics. <p style="text-align: center;"><b>OR</b></p> What is big supply chain analytics? Explain five C's of the effective supply chain analytics.	CO1
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Q 8	<p>How does prescriptive analytics work? How to use prescriptive analytics in various industries like healthcare, oil &amp; gas, aerospace, consumer goods, chemicals, and retail? Explain in detail.</p> <p style="text-align: center;"><b>OR</b></p> <p>Discuss various parameters on which supervised machine learning differs from unsupervised machine learning techniques.</p>	<b>CO2</b>																																
Q 9	<p>Using R programming, the output for Maximum Likelihood factor analysis method is given below:</p> <p>Call: KMO (r = data)</p> <p>Overall MSA = 0.78</p> <p>MSA for each item: var 1 (0.82), var 2 (0.83), var 3 (0.81), var 4 (0.58), var 5 (0.60), var 6 (0.82), var 7 (0.82), var 8 (0.82), var 9 (0.81)</p> <p>#Bartlette's Test of Sphericity</p> <p>\$chisq</p> <p>[1] 561.2234</p> <p>\$p.value</p> <p>[1] 1.681323e-95</p> <p>\$df</p> <p>[1] 36</p> <p>Parallel analysis suggests that the number of factors = 3 and the number of components = NA</p> <p>Factor Analysis using method = ml</p> <p>Call: fa (r = data, nfactors = 3, rotate = "oblimin", fm = "ml")</p> <p>Loadings:</p> <table border="1" data-bbox="224 1417 880 1860"> <thead> <tr> <th></th> <th>ML2</th> <th>ML3</th> <th>ML1</th> </tr> </thead> <tbody> <tr> <td>Var 1</td> <td>0.12</td> <td>0.817</td> <td>0.69</td> </tr> <tr> <td>Var 2</td> <td>-0.60</td> <td>0.800</td> <td>0.59</td> </tr> <tr> <td>Var 3</td> <td>-0.07</td> <td>0.871</td> <td>0.74</td> </tr> <tr> <td>Var 4</td> <td>0.01</td> <td>-0.60</td> <td>0.770</td> </tr> <tr> <td>Var 5</td> <td>0.00</td> <td>0.00</td> <td>0.983</td> </tr> <tr> <td>Var 6</td> <td>-0.30</td> <td>0.18</td> <td>0.418</td> </tr> <tr> <td>Var 7</td> <td>0.943</td> <td>-0.09</td> <td>0.80</td> </tr> </tbody> </table>		ML2	ML3	ML1	Var 1	0.12	0.817	0.69	Var 2	-0.60	0.800	0.59	Var 3	-0.07	0.871	0.74	Var 4	0.01	-0.60	0.770	Var 5	0.00	0.00	0.983	Var 6	-0.30	0.18	0.418	Var 7	0.943	-0.09	0.80	<b>CO3</b>
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Var 8	0.848	0.12	0.03
Var 9	0.926	0.03	0.88

	ML2	ML3	ML1
SS loadings	2.486	2.125	1.735
Proportion Variance	0.276	0.236	0.193
Cumulative Variance	0.276	0.512	0.705

Answer the following questions:

- Which package to install from library to run the ML factor analysis method? (1 mark)
- The overall MSA value is \_\_\_\_\_ and coming in the range of \_\_\_\_\_ to \_\_\_\_\_, also called as \_\_\_\_\_. (3 marks)
- How many reduced factors you have obtained from the output? Name and list them down with their factor loading patterns (3 marks)
- How much is the total percentage of trace for reduced factors? (1 mark)
- Write the script which is used in ML factor analysis method for making scree plot in R? What is the use of scree plot? (2 marks)

Q 10

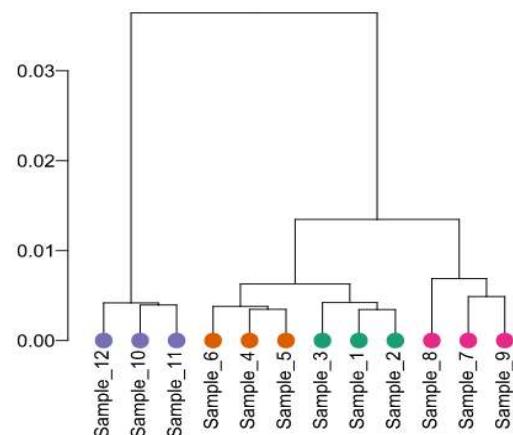
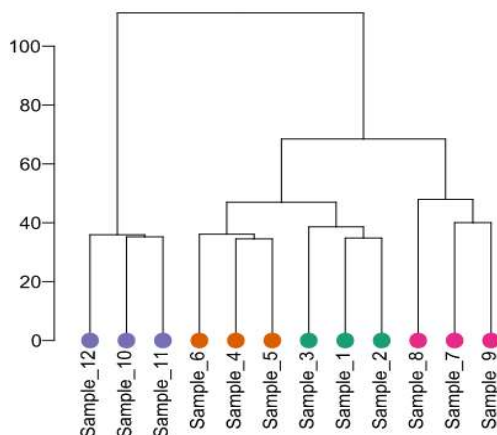
- What are the assumptions of linear regression analysis? (4 marks)
- Write the general syntax for conducting a regression with one continuous independent variable in R. (2 marks)
- Write the general syntax for conducting multiple regression with three continuous independent variables in R. (4 marks)

CO3

Q 11

How support vector machines help in solving the real world problems? Explain in points in your own words. List down the various machine learning toolkits of Kernel support vector machines.

OR



CO4

	<p>Answer the following questions:</p> <ol style="list-style-type: none"> <li>What is the name of this figure? (2 marks)</li> <li>Write down the three-cluster solution for both figures. (4 marks)</li> <li>Write down the steps taken up for Hierarchical cluster analysis using SPSS. (4 marks)</li> </ol>	
<p><b>SECTION C</b></p> <p><b>1. Each Question carries 20 Marks.</b></p> <p><b>2. Instruction: Q12 divided into two parts and carries 10 marks each.</b></p>		
<p>Q 12</p>	<p>A) Pushpa wants to introduce new coffee maker and wish to assess how consumers evaluate the various attribute levels of the product.</p> <p>These are:</p> <ol style="list-style-type: none"> <li>Price (Indian Rupees): 5000; 7000; 7500</li> <li>Time taken to make coffee (in minutes): 10; 15; 18; 20</li> <li>Capacity (in standard cups): 5; 10; 15</li> </ol> <p><i>Answer the following:</i></p> <ol style="list-style-type: none"> <li>Write down the steps for performing conjoint analysis in SPSS. (5 marks)</li> <li>How many attributes and levels observed? (3 marks)</li> <li>How many different possible combinations obtained? (2 mark)</li> </ol> <p>B) SKF, a vendor wants to determine from Berger Paints (customer), how important each attribute is to them. Also, they want to know the utility they derive from a given combination of levels of attributes. SMC thinks that machinery and product are important to the consumer.</p> <p>These are:</p> <ol style="list-style-type: none"> <li>Machinery setup time: 1 hour; 6 hour; 12 hour; 24 hour</li> <li>Machinery Delivery: 7 days; 30 days; 45 days</li> <li>Number of products: 2, 4, 7</li> </ol> <p>Using the SPSS output for Conjoint Analysis through Regression Model tables below to <i>answer the following questions:</i></p> <ol style="list-style-type: none"> <li>Name all the VAR1 to VAR7 from the output. (5 marks)</li> <li>Based on output, interpret the results. Also, calculate part utility and range of utilities. (3 marks)</li> <li>Which gives the best possible combination and least possible combination? (2 marks)</li> </ol>	<p><b>CO3</b></p>

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.988	.976	.970	1.837

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3790.500	7	541.500	160.444	.000
	Residual	94.500	28	3.375		
	Total	3885.000	35			

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.500	.306		60.421	.000
	VAR1	6.500	.530	.422	12.257	.000
	VAR2	3.500	.530	.238	6.600	.000
	VAR3	-2.500	.530	-.170	-4.714	.000
	VAR4	1.000	.433	.079	2.309	.029
	VAR5	.000	.433	.000	.000	1.000
	VAR6	-12.000	.433	-.943	-27.713	.000
	VAR7	3.750	.433	.295	8.660	.000