UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Mid Semester Examination, March, 2017

Program/course: B.Tech-CS-EC   Semester – VII
Subject: Retail analytics   Max. Marks : 100
Code : BBCR173   Duration : 3 Hrs
No. of page/s: 3

Set-1

Section-A

Attempt all questions   **[2 * 10 = 20]**

Q.1: Contrast between management problem and research problem with suitable examples.

Q.2: What is a causal research design? What is its purpose? Explain? Also differentiate between causation and association.

Section-B

Attempt all questions   **[2 * 10 = 20]**

Q.3. Differentiate between exploratory and conclusive research designs.

Q.4. Define the term research in your own words. Exemplify the steps involved in problem identification with respect to a research project.

Section-C

Attempt all questions   **[2 * 15 = 30]**

Q.5: Sam Sleepresearcher hypothesizes that people who are allowed to sleep for only four hours will score significantly lower than people who are allowed to sleep for eight hours on a cognitive skills test. He brings sixteen participants into his sleep lab and randomly assigns them to one of two groups. In one group he has participants sleep for eight hours and in the other group he has them sleep for four. The next morning he administers the SCAT (Sam's Cognitive Ability Test) to all participants. (Scores on the SCAT range from 1-9 with high scores representing better performance). The scores are presented in the following table.

SCAT Scores	
8-hours sleep group	**4-hours sleep group**
5	8
7	1
5	4
3	6
5	6
3	4
3	1
9	2

As a part of your answer---

a) State the null and alternate hypotheses of the test
b) Calculate the t- statistics and interpret

Q.6. Give a detailed note on various sampling techniques? Also clearly justify the importance of sampling in a research project.
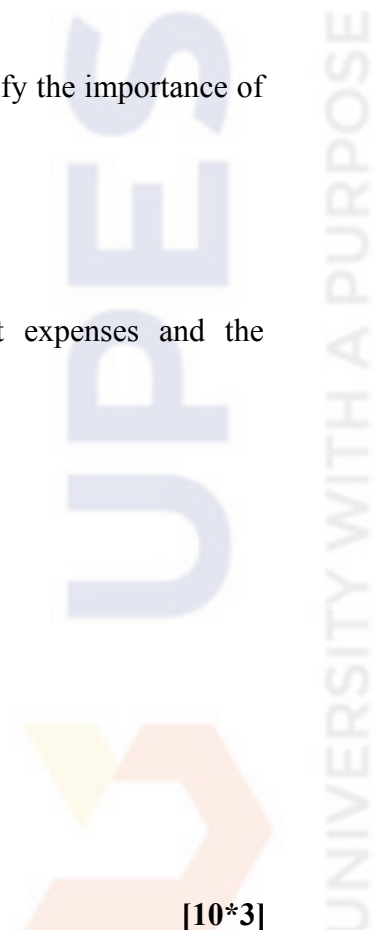
Section-D

Attempt all questions

Q.9. Following are the past data of a retail store on advertisement expenses and the corresponding sales .

Ad. Expense in Dollar	Sales in dollar
10	20
12	22
10	24
14	25
15	28
17	30
20	40

As a part of your answer

[10*3]

a) **E**stimate the regression line of sales on advertising expense
b) Test the model for statistical significance
c) Evaluate the goodness of fit of the model based on R square.

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Set-2

Section -A

Attempt all questions

Q.1. Evaluate the different data types with suitable examples. How data types matter before applying any analysis on the data?

[10 marks]

Q.2. Elucidate the research process in detail.

[10 Markes]

Section-B

Attempt all

Q.2. A retailer is interested to see whether customers spending on garments differ according to his profession. Three professions namely businessman, service class and students were considered and their spending in terms of INR was recorded. The following results were found:

SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
Students	9	138	15.33	2.50
Businessman	9	190	21.11	11.61
Service class	9	299	33.22	5.94

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1500.222	2	750.1111	112.205	6.61E-13	3.402826
Within Groups	160.4444	24	6.685185			
Total	1660.667	26				

As a part of your answer:

    a. Write concerning null and alternate hypotheses.
    b. Critically interpret the results.
    c. Explicitly mention two implications of results obtained to the retailer

[20 marks]

Section-C

Q.4. How exploratory research design is different from the conclusive research? Justify.

[15 marks]

Q.5. Exemplify the various sampling techniques in detail?

[15 marks]

Section-D

Q.6. A retailer is investigating his past sales, advertising expenditure and number of salespeople employed data. He sets up a linear regression model to see the relationship of advertising and sales people employed onto sales and finds following results.

Regression Statistics	
Multiple R	0.882460482
R Square	0.778736503
Adjusted R Square	0.704982004
Standard Error	1.506651779
Observations	9

ANOVA					
	df	SS	MS	F	p value
Regression	2	47.93555806	23.96777903	10.55849491	0.010833
Residual	6	13.6199975	2.269999583		
Total	8	61.55555556			

	Coefficients	Standard Error	t Stat	P-value
Intercept	9.957632733	3.123798548	3.18766802	0.018891894
Ad Expenses	5.231612429	1.42500293	3.67129942	0.010438097
Salespersons	0.128091192	0.24482654	0.523191613	0.619592061

[10*3 = 30 marks]

As a part of your answer

a. Give a detail note on the model used by the analysis. Explicitly write the model obtained mathematically.
b. Interpret the results obtained.
c. Explicitly mention any two implications to the retailer based on obtained results.