

Name:	 UPES <small>UNIVERSITY WITH A PURPOSE</small>
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2021

Course: Business Research Method Program: MBA (PM) Course code: DSRM 7002 Instructions: All the sections are compulsory.	Semester: II Time: 03 Hours Max. Marks: 100
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For all the section use following statistical values(at 5% level of significance and two tailed test):
 $(\chi^2 = 3.841 \text{ df} = 1, \chi^2 = 5.991 \text{ at } \text{df} = 2, \chi^2 = 7.815 \text{ at } \text{df} = 3, \chi^2 = 9.488 \text{ at } \text{df} = 4)$
 $(t = 2.086 \text{ df} = 20, t = 2.060 \text{ df} = 25, t = 2.042 \text{ df} = 30, t = 2.021 \text{ df} = 40, t = 2.009 \text{ df} = 50)$
 $(Z = 1.645 \text{ at } \alpha = 10\%, Z = 1.96 \text{ at } \alpha = 5\%)$

SECTION A

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

S.No	Question:	CO
Q 1	<p>a) Studies show that listening to music while studying can improve your memory. To demonstrate this, a researcher obtains a sample of 36 college students and gives them a standard memory test while they listen to some background music. Under normal circumstances (without music), the mean score obtained was 25 and standard deviation is 6. The mean score for the sample after the experiment (i.e With music) is 28. What is the null hypothesis in this case?</p> <ol style="list-style-type: none"> i) Listening to music while studying will not impact memory. ii) Listening to music while studying may worsen memory. iii) Listening to music while studying may improve memory. iv) Listening to music while studying will not improve memory but can make it worse. <p>b) What would be the Type I error in the part (a) of question 1?</p> <ol style="list-style-type: none"> i) Concluding that listening to music while studying improves memory, and it's right. ii) Concluding that listening to music while studying improves memory when it actually doesn't. iii) Concluding that listening to music while studying does not improve memory but it does. 	CO1
Q2	<p>a) For the use of a chi-square test, the data is required in the form of _____.</p> <p>b) If the simple correlation coefficient between two variables is _____, the variables must be independent.</p>	CO1

Q3	<p>a) For testing the value of the population mean, a _____ test should be used when the sample size is small and the population standard deviations are known.</p> <p>b) Hypothesis must have</p> <ul style="list-style-type: none"> i) Applicability ii) Durability iii) Testability iv) Measurement 	CO1
Q4	<p>a) Census data is an example of _____ data source.</p> <p>b) Questionnaire is a :</p> <ul style="list-style-type: none"> i) Research method ii) Measurement technique iii) Tool for data collection iv) Data analysis technique 	CO1
Q5	<p>a) The data that is always collected first in a research study is called _____ data.</p> <p>b) Which of the following is the first step in starting the research process?</p> <ul style="list-style-type: none"> i) Searching sources of information to locate problem. ii) Survey of related literature iii) Identification of problem iv) Searching for solutions to the problem 	CO1
Q6	<p>a) Standard deviation can be negative.</p> <ul style="list-style-type: none"> i) TRUE ii) FALSE <p>b) A numerical value used as a summary measure for a sample, such as sample mean, is known as a</p> <ul style="list-style-type: none"> i) population parameter ii) sample parameter iii) sample statistic iv) population mean v) None of the above answers is correct. 	CO1

SECTION B

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

Q1	An investigator wants to estimate the proportion of freshmen at his University who currently smoke cigarettes (i.e., the prevalence of smoking). How many freshmen should be involved in the study to ensure that a 95% confidence interval estimate of the proportion of freshmen who smoke is within 5% of the true proportion?	CO2																				
Q2	Prepare a box plot, identify outliers and interpret the box plot for the following data set. 5,40,42,46,48,49,50,50,52,53,55,56,58,75,102	CO2																				
Q3	A sample of 200 bulbs made by a company give a lifetime mean of 1540 hours with a standard deviation of 42 hours. Is it likely that the sample has been drawn from a population with a mean lifetime of 1500 hours? You may use 5% level of significance.	CO2																				
Q4	Two salesmen ,A and B are employed by a company. Recently, it has conducted a sample survey yielding the following data: <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th></th><th>Salesman A</th><th>Salesman B</th></tr></thead><tbody><tr><td>No of sell</td><td>20</td><td>22</td></tr><tr><td>Average sell</td><td>700</td><td>780</td></tr><tr><td>Standard deviation</td><td>80</td><td>60</td></tr></tbody></table> <p style="text-align: center;">Is there any significant difference between the average sales of the two salesmen?</p>		Salesman A	Salesman B	No of sell	20	22	Average sell	700	780	Standard deviation	80	60	CO3								
	Salesman A	Salesman B																				
No of sell	20	22																				
Average sell	700	780																				
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Q5	a) Distinguish between null and alternative hypothesis with example. b) The following table gives the number of good and defective parts produced by each of the three shifts in a factory. <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th>Shift</th><th>Good</th><th>Defective</th><th>Total</th></tr></thead><tbody><tr><td>Day</td><td>900</td><td>130</td><td>1030</td></tr><tr><td>Evening</td><td>700</td><td>170</td><td>870</td></tr><tr><td>Night</td><td>400</td><td>200</td><td>600</td></tr><tr><td>Total</td><td>2000</td><td>500</td><td>2500</td></tr></tbody></table> <p style="text-align: center;">Is there any association between the shifts and the quality of the parts produced? Use a 0.05 level of significance.</p>	Shift	Good	Defective	Total	Day	900	130	1030	Evening	700	170	870	Night	400	200	600	Total	2000	500	2500	CO3
Shift	Good	Defective	Total																			
Day	900	130	1030																			
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SECTION-C

- 1. Each Question carries 20 Marks.**
- 2. Instruction: Write long answer.**

Q1	<p>ABC manufacturing Company had produced a herbal tooth powder five years back and was marketing the same in rural Punjab. The company is about 20 year old and is producing various toiletry products in Punjab. It had a name in the rural market of Punjab. The herbal powder was launched only five years back and had shown a compound annual growth rate of 18 per cent. The CEO of the company Mr. Avtar Singh, was thinking of introducing the herbal tooth powder in the urban area of Punjab.</p> <p>Mr. Singh got a preliminary research done with regard to the tooth powder market. The results of this research indicated that generally, people in urban areas preferred toothpaste instead of tooth powder. This was more so in case of young people below the age of 20 years. Mr. Singh had a meeting with senior officials of the company and decided to get a research study conducted from a marketing research company with the following objective:</p> <ul style="list-style-type: none"> • To estimate the proportion of population that used tooth powder. • To understand the demographic and psychographic profile of people who used tooth powder. • To understand the reasons for not using tooth powder • To get an understanding of the media habits of both the users and non-users of tooth powder. <p>The research team in the marketing research company defined the users of tooth powder as those who had bought tooth powder in the last six months. In order to select the users of tooth powder they conducted a preliminary study. A sample of 500 respondents was taken from Amritsar, Jalandhar, Ludhiana and Patiala. The results of the study indicated that out of the 500 respondents selected randomly, 20 per cent were below the age of 20. Out of the remaining 400 respondents, 30 per cent refused to participate in the study. Out of the remaining sample 60 per cent did not use tooth powder, 30 per cent brought it only once in a year or two and only 10 per cent of the respondents bought it at least once in six months. The cost of sampling 500 respondents was Rs. 40,000/-.</p> <p>The company wanted to select 200 users from both Amritsar and Ludhiana, whereas 100 respondents were to be selected from Jalandhar and Patiala each. The remaining 300 users were to be selected from the remaining urban/semi-urban towns of Punjab. In brief, the marketing research company wanted a total sample of 900. It was argued that a large sample should be taken from larger cities.</p> <p>A total budget of Rs. 400000/- was allocated for the research, out of which Rs 250000/- was for the purpose of field work. One of the members of the research team indicated that the total budget for the field work would not be sufficient to get the desired number of users of tooth powder. He suggested that chemist shops and ‘General Kirana Stores’ could be contacted for identifying the users.</p>	CO4
a)	Will the money allocated for the fieldwork be sufficient to get the desired size of the sample from various towns of Punjab as mentioned in the case?	
b)	How would you defined the population and the sampling frame in this case?	