Jaipuria Institute of Management, Noida

PGDM/PGDM (M)/PGDM (S), 2016 – 2018; Term I

End term examination

Quantitative Analysis for Management – I (OP 101)

Time: - 2 Hours Max Marks: 40

All questions are compulsory.

Q1. Tiara's fashions is a retailer for men and women fashion garments in NCR. The Management of Tiara has a general perception that on an average, women spend more money per month on fashion garments in comparison to men. To test this perception, Tiara's management has collected data for 12 men customers and 15 women customers about their monthly expenditure on fashion garments and the following results were obtained.

t-Test: Two-Sample Assuming Equal Variances

	Men	*Women*
Mean	5.5	7.4
Variance	5.363636364	8.114285714
Observations	12	15
Pooled Variance	6.904	
Hypothesized Mean Difference	0	
Df	25	
t Stat	-1.867057014	
P(T<=t) one-tail	0.036831643	
t Critical one-tail	1.708140761	
P(T<=t) two-tail	0.073663287	
t Critical two-tail	2.059538553	

State the null and alternate hypothesis and explain the output obtained. At $\alpha = 0.05$, can Tiara conclude that their perception is valid? **(5 Marks)**

Q2. "Adrenaline Adventures" is a theme park and their profits heavily depends on the expenditure done on promotion. The management of the game park mainly depends on two methods of promotion, Advertisement and Sales Promotion (i.e. giving one entry free for every group of four persons, or giving the next game park visit at 50 % price if the group size is more than five etc.). The management has recently engaged a consultant for prediction of the effectiveness of these two promotion method. The consultant has uses a software and submitted the following report based on past data. Identify the dependent and independent variables and establish the regression model between variables. Interpret the values of R square. Also predict what will be the expected revenue if Rs 12 Lacs and Rs 15 Lacs are spent on Advertisement and Sales Promotion respectively. ***(10 Marks)***

SUMMARY OUTPUT - Adrenaline Adventures

Regression Statistics	
Multiple R	0.99791581
R Square	0.99583597
Adjusted R Square	0.99417035
Standard Error	0.98542003
Observations	8

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	2	1161.1447	580.5724	597.8794	1.12E-06
Residual	5	4.8552632	0.971053		
Total	7	1166			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	7.59868421	2.014918	3.771213	0.013007	2.419173	12.778	2.4192	12.778
Advertisng Expenditure (Lacs)	6.44736842	0.6782126	9.506412	0.000218	4.703967	8.1908	4.704	8.1908
Sales Promotion expenditure (Lacs)	-3.3815789	1.1909021	-2.83951	0.036267	-6.44289	-0.32	-6.443	-0.32

Q3. Arthritis is a painful, chronic inflammation of the joints. An experiment on the side effects of pain relievers examined arthritis patients to find the proportion of patients who suffer side effects when using ibuprofen to relieve the pain. If more than 3% of users suffer side effects, the Food and Drug Administration will put a stronger warning label on packages of ibuprofen.
DATA: 440 subjects with chronic arthritis were given ibuprofen for pain relief; 23 subjects suffered from adverse side effects. At 95 percent confidence interval justify whether the warning label is required. ***(7 Marks)***

Q4. (a) Robertson Employment service customarily gives standard intelligence and aptitude tests to all people who seek unemployment through the firm. The firm has collected the data for several years and found that the distribution of scores with a mean of 86 and a standard deviation of 16.What is the probability that that in a sample of 75 applicants who take the test, the mean score will be less than 84 or greater than 90? ***(5Marks)***

(b) Differentiate between one tailed and two tailed test giving suitable examples. ***(3Marks)***

Q5. A scientist claims that the people who eat high fiber cereal for breakfast will consume, on average, fewer calories for lunch than people who do not eat high fiber cereal for breakfast. As a preliminary test of the claim, 150 people were randomly selected and asked what they regularly eat for breakfast and lunch. Each person was identified as the consumer or non-consumer of high-fiber cereal, and the number of calories, consumed at lunch was measured and recorded.

Consumers		Non Consumers	
Mean	604.02	Mean	633.23
Standard Error	9.76	Standard Error	9.98
Median	607	Median	628
Mode	568	Mode	663
Standard Deviation	64.05	Standard Deviation	103.29
Sample Variance	4102.97	Sample Variance	10669.76
Kurtosis	0.46	Kurtosis	-0.54
Skewness	-0.07	Skewness	-0.13
Range	272	Range	464
Minimum	467	Minimum	369
Maximum	739	Maximum	833
Sum	25973	Sum	67756

Count	43	Count	107

(a) Use descriptive statistics to summarize the data and explain the significance of the statistical measures used as per the values mentioned in the table. ***(5Marks)***

z-Test: Two Sample for Means

	Consumers	Non Consumers
Mean	604.02	633.23
Known Variance	4103	10670
Observations	43	107
Hypothesized Mean Difference	0	
z	2.09	
P(Z<=z) one-tail	0.01	
z Critical one-tail	1.64	
P(Z<=z) two-tail	0.03	
z Critical two-tail	1.95	

(b) Conduct a hypothesis test to determine whether the mean consumption of calories of non-consumer is greater than the mean consumption of calories of consumers. Test the hypothesis at 1% level of significance. Draw conclusions. ***(5Marks)***