EMG 242-3 Statistics for Management (Repeat)

Part C- Essay Questions

Answer four (04) questions, including question No. 01
Marks allocation: 50 Marks

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1. Some critics of big business argue that CEOs are overpaid and that their compensation is not related to the performance of their companies. To test this theory, *Business Today* (2010) collected data on executive's total pay and company's performance for each in a sample of 17 CEOs selected from a variety of industries. (Note: Company performance is the three-year annualized total return to shareholders for the years 2007 to 2009, assuming dividends are reinvested.) Use the following summery statistics to accomplish the analysis which are calculated based on the collected data.

$\sum_{i=1}^{17} x_i = 755.9$ $\sum_{i=1}^{17} y_i = 285412$ $\sum_{i=1}^{17} x_i^2 = 77402.4$

$\sum_{i=1}^{17} y_i^2 = 16051516284$ $\sum_{i=1}^{17} x_i y_i = 32460260$

Where CEO pay (y) is in thousands of rupees and company performance (x) is in percent.

a) Compute the coefficient of correlation for these data. Does it appear that CEO pay is related to company performance? Explain. **(02 Marks)**

b) Is CEO compensation related to company performance? Conduct the appropriate hypothesis test using $\alpha = 0.05$. **(03 Marks)**

c) Use the method of least squares to model the relationship between CEO pay (y) and company performance (x). **(03 Marks)**

d) Interpret the estimate of β_1 in the context of the problem. **(01 Marks)**

e) Construct the ANOVA table and check whether the model is significance or not. **(05 Marks)**

f) Find the coefficient of determination and comment on it. **(02 Marks)**

g) Construct a 90% confidence interval for β_1 and interpret your result in the context of the problem. **(02 Marks)**

h) How might the results of part (g) change if a sample of CEOs from the same industry were used? **(01 Marks)**

i) Estimate the average CEO pay when company performance is 30.5 percent. **(01 Marks)**

2. A large industrial firm uses three local motels to provide overnight accommodations for its clients. From past experience it is known that 20% of the clients are assigned rooms at the Ramada Inn, 50% at the Hill-Wood Palace, and 30% at the Lakeview Motor Lodge. If the plumbing is faulty in 5% of the rooms at the Ramada Inn, in 4% of the rooms at the Hill-Wood Palace, and in 8% of the rooms at the Lakeview Motor Lodge,

   a) What is the probability that a client will be assigned a room with faulty plumbing?

   (05 Marks)

   b) What is the probability that a person with a room having faulty plumbing was assigned accommodation at the Lakeview Motor Lodge?

   (05 Marks)

3. Mr. Ramal G. Jasinghe is the director of the BBB- rated insurance company of Sri Lanka. He would like to compare the daily travel expenses for the insurance sales agent and the insurance sales officer's staff within a selected division. He collected the following sample information.

Officers (Rs.)	131	135	146	165	136	142	137	
Agents (Rs.)	130	102	129	143	149	120	139	105

Summery Statistics:

Variable	Mean	Sample Size	Standard Deviation	Variance	Sum	Sum of Squares
Officers (Rs.)	141.71	7	11.37	129.24	992	141356
Agents (Rs.)	127.13	8	17.13	293.55	1017	131341

   a) At the 0.10 significance level, can he conclude that the mean daily expenses are greater for the sales officer staff than the sales agent staff?

   (08 Marks)

   b) State the assumptions important to perform this test.

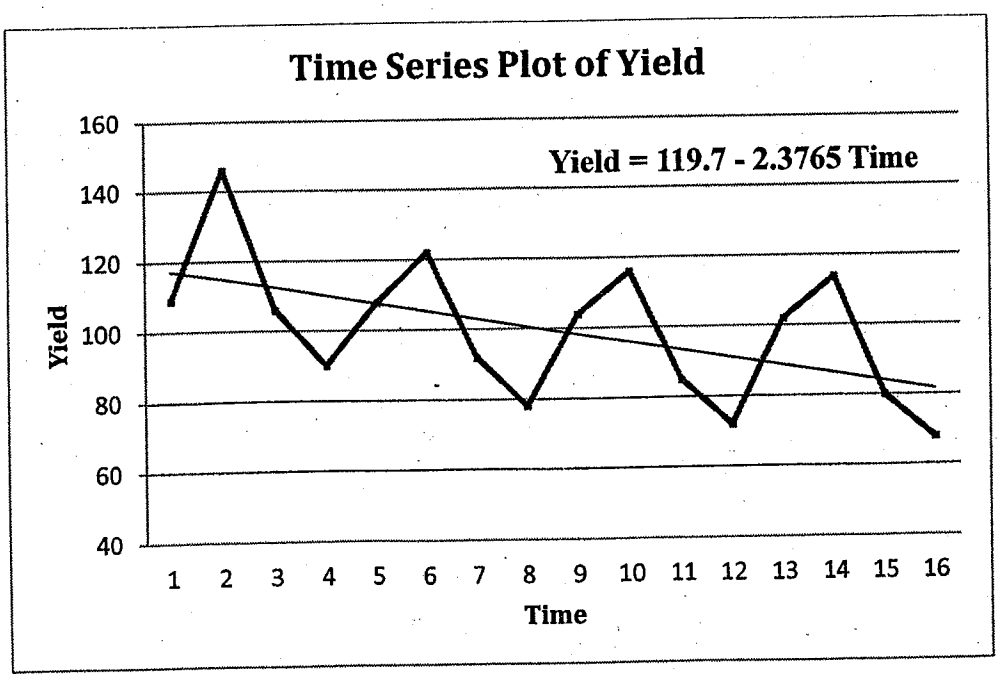
   (02 Marks)

4. The following table (Table 01) gives the quarterly yield of coconuts (in thousands) from a single estate over a period of 4 years and Figure 01 gives the time series plot.

Table 01: *Quarterly yield of coconuts (in thousands)*

Year	Quarter	Yield	Estimated Trend Values
2005	1	109	117.32
	2	146	114.95
	3	106	112.57
	4	90	110.19
2006	1	108	107.82
	2	122	105.44
	3	92	103.06
	4	78	100.69
2007	1	104	98.31
	2	116	95.94
	3	85	93.56
	4	72	91.18
2008	1	102	88.81
	2	114	86.43
	3	80	84.05
	4	68	81.68

Figure 01: *Time series plot of quarterly yield of coconuts (in thousand)*



a) Comment the time series plot of yield (Figure 01).

(02 Marks)

b) By assuming the **Additive Model**, estimate the seasonal component.

(06 Marks)

c) Forecast the coconut yield for the first two quarters of the year 2009. (The fitted trend model $\mathbf{T = 119.7 - 2.3765t}$)

(02 Marks)

5. Post Graduate Institute of Management (PIM) of USJ is conducting a MBA program. Three years after receiving their degrees, PIM graduates have reported their annual salary rates to PIM administration division. Past records clearly show that there were two groups of MBA graduate employees. Graduates in one group are employed by consulting firms, while the other group consists of graduates who are with national-level corporations.

   PIM Program Administrator wishes to investigate whether the mean annual salary differs significantly in these two groups.

   Discuss how you would investigate the program administrator's claim.

   Your answer should include;

   - ✓ methodology
   - ✓ hypotheses
   - ✓ assumption(s)
   - ✓ statistical test
   - ✓ decision rules

(10 Marks)

_____ End. _____