ชื่อ.....รหัส.....

PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Final Examination: Semester 1 Academic Year: 2014

Date: December, 17, 2014 Time: 13:30-16:30 AM

Subject: 225-514/227-501 Logistics and Supply Chain Mgt Room: A 205

คำชี้แจง

- ☐ ข้อสอบมี 10 ข้อ (10 หน้า) ให้ทำทุกข้อ
- ☐ อนุญาตให้นำเอกสารทุกชนิดเข้าห้องสอบได้
- ☐ คะแนนรวม 105 คะแนน

ทุจริตในการสอบโทษขั้นต่ำคือปรับตกในรายวิชาที่ทุจริต และพักการเรียน 2 ภาคการศึกษา

ภายใต้สังคมที่เต็มไปด้วยการทุจริต และความไม่ซื่อสัตย์ เพื่อเป็นแบบอย่างที่ดีต่อสังคมและเพื่อ ส่งเสริมคุณธรรม และ จริยธรรมให้เกิดในสังคม ข้าพเจ้าจะซื่อสัตย์ในการสอบ

ลงชื่อ.....

ขอให้โชคดี จาก เสกสรร สุธรรมานนท์

ข้อ	คะแนนเต็ม	คะแนนที่ได้
1	20	
2	15	
3	20	
4	20	
5-10	ข้อละ 5 คะแนน (รวม 30)	

ยอมสอบตกอย่างมีศักดิ์ศรี ดีกว่าการได้คะแนนดีโดยทุจริต

ทำผิดได้ แต่อย่าทำชั่ว

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1. SC consulting, a supply chain consulting firm, must decide on the location of its home offices. Its clients are located primarily in the 16 states list in the following table. There are four potential sites for home offices: LA, Tulsa, Denver, and Seattle. The annual fixed cost of locating an office in LA is $165,428, Tulsa is $131,230, Denver is $140,000 and Seattle is $145,000.

State	LA	Tulsa	Denver	Seattle	Number of trips
Washington	150	250	200	25	40
Oregon	150	250	200	75	35
California	75	200	150	125	100
Idaho	150	200	125	125	25
Nevada	100	200	125	150	40
Montana	175	175	125	125	25
Wyoming	150	175	100	150	50
Utah	150	150	100	200	30
Arizona	75	200	100	250	50
Colorado	150	125	25	250	65
New Mexico	125	125	75	300	40
North Dakota	300	200	150	200	30
South Dakota	300	175	125	200	20
Nebraska	250	100	125	250	30
Kansas	250	75	75	300	40
Oklahoma	250	25	125	300	55

Each consultant is expected to take at most 25 trips each.

If there are no restrictions on the number of consultants at a site and the goal is to minimize costs, where should the home offices be located and how many consultants should be assigned to each office? What is the annual cost in term of facility and travel? **Formulate the mathematical model for this problem**. If the result is provided as the following table, please interpret the results.

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State	Total # of trips	Trips from LA	Cost from LA	Trips from Tulsa	Cost from Tulsa	Trips from Denver	Cost From Denver	Trips from Seattle	Cost from Seattle
Washington	40	-	150	-	250	-	200	40	25
Oregon	35	-	150	-	250	-	200	35	75
California	100	100	75	-	200	-	150	-	125
Idaho	25	-	150	-	200	-	125	25	125
Nevada	40	40	100	-	200	-	125	-	150
Montana	25	-	175	-	175	-	125	25	125
Wyoming	50	-	150	-	175	50	100	-	150
Utah	30	-	150	-	150	30	100	-	200
Arizona	50	50	75	-	200	-	100	-	250
Colorado	65	-	150	-	125	65	25	-	250
New Mexico	40	-	125	-	125	40	75	-	300
North Dakota	30	-	300	-	200	30	150	-	200
South Dakota	20	-	300	-	175	20	125	-	200
Nebraska	30	-	250	30	100	-	125	-	250
Kansas	40	-	250	40	75	-	75	-	300
Oklahoma	55	-	250	55	25	-	125	-	300
# of trips			190		125		235		125
# of Consultants			8		5		10		6
Fixed Cost of office			165,428		131,230		140,000		145,000
Cost of Trips			15,250		7,375		19,625		9,875
Total Office Cost			180,678		138,605		159,625		154,875

Total System Cost 633,783

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2. Given the following data for demand at the XYZ Company, calculate the monthly forecast for 2003 using a 3-month moving average, 5-month moving average and simple exponential smoothing with an α = 0.2. By comparison, which model is the best forecast? Why?

Period	Demand	3-month moving average	5-month moving average	simple exponential smoothing with an α =0.2
Oct 02	850			
Nov 02	950			
Dec 02	900			
Jan 03	1000			
Feb 03	950			
Mar 03	1050			
Apr 03	850			
May 03	1100			
Jun 03	900			
Jul 03	1150			
Aug 03	1100			
Sep 03	900			
Oct 03	1000			
Nov 03	800			
Dec 03	1000			

3. Cooper Toys sells a portable baby stroller called the Tot n'Trot. The past two years of demand for Tot n'Trots are shown in the following table. Using regression analysis, develop a forecasting model with monthly seasonal indices for Cooper Toys. Forecast demand for each of months in the six-month period covering January through June 2015.

Month	Period	Demand
January 2013	1	1,200
February	2	1,400
March	3	1,450
April	4	1,580
May	5	1,796
June	6	2,102
July	7	2,152
August	8	2,022
September	9	1,888
October	10	1,938
November	11	1,988
December	12	1,839
January 2014	13	1,684
February	14	1,944
March	15	1,994
April	16	2,154
May	17	2,430
June	18	2,827
July	19	2,877
August	20	2,687
September	21	2,492
October	22	2,542
November	23	2,592
December	24	2,382

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The result from Microsoft Excel is provided as the following table.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.848663453
R Square	0.720229656
Adjusted R Square	0.707512822
Standard Error	244.6275521
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3389243.27	3389243.3	56.635926	1.60358E-07
Residual	22	1316538.063	59842.639		
Total	23	4705781.333			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	1403.068841	103.0739379	13.612256	3.406E-12	1189.306577	1616.8311	1189.3066	1616.8311
X Variable 1	54.28782609	7.213672961	7.5256844	1.604E-07	39.32758401	69.248068	39.327584	69.248068

4. KraftyCity is a large retailer that sells power tools and other hardware supplies. One of its products is the Krafty-Man workbench. Information on the workbench is as follows:

Annual demand	= 1,200
Holding cost	= $15 per workbench per year
Ordering cost	= $ 200 per order

4.1 What is the economic order quantity for the workbench?

4.2 Suppose that KraftyCity has to pay $ 50 per workbench for orders under 200 but only $42 per workbench for orders of 201 or more. What order quantity should KraftyCity use?

5. Discuss the role of safety inventory in the supply chain and the trade-offs involved.

6. Explain the impact of supplier lead time on safety inventory.

7. What trade-offs do managers need to consider when making transportation decisions?

8. How does e-business affect supply chain activities?

9. Explain the role of information in the supply chain.

10. Discuss the importance of managing supply chain relationships for cooperation and trust.