UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: B.Tech ADE   **Semester: VI**
Program: Industrial Engineering & Management   **Time 03 hrs.**
Course Code: IMGT-303   **Max. Marks: 100**
Instructions: All the questions are compulsory.

SECTION A

S. No.		Marks	CO
Q 1	Explain Man – machine system also classify in brief?	5	CO4
Q 2	Explain Simo chart and its usefulness for method improvement?	5	CO4
Q 3	Briefly explain the methods to forecast sales for new products?	5	CO1
Q 4	List out 9 factors responsible for quality of product or service?	5	CO2

SECTION B

Q 5	Identify the key difference between Fayol and Taylor's Theory of Management.	10	CO4
Q 6	A manufacturing company purchase 9000 parts of a machine for its annual requirements ordering for month usage at a time, each part costs Rs. 20. The ordering cost per order is Rs. 15 and carrying charges are 15% of the average inventory per year. You have been assigned to suggest a more economical purchase policy for the company. What advice you offer and how much would it save the company per year?	10	CO1
Q 7	Explain the product layout and process layout. Discuss the factors which influence the selection of one or another. OR Explain the various principles of plant layout.	10	CO3
Q 8	In a stop watch time study, the elemental time observed in sec is; 10,9,10,9,10,10,11,10,10 and 11. Examine whether the number of observations are enough at ±5 % accuracy with 95 % confidence level.	10	CO4

SECTION-C

| Q 9 | A 5 mm dia hole is drilled in a 25 mm dia steel shaft at a distance of 30 mm from its one end. Total length of the shaft is 200 mm. For time study purpose, the analyst has divided the elemental time data for 8 cycles and the rating of each element and determined by the analyst are given below:
  (a) Prepare the time study observation sheet for this operation showing the watch reading if continuous method of reading the stop watch was used.
  (b) Also determine the normal time of this operation. | 20 | CO5 |

Element	Activity	Element Times (Sec.)								Rating factor
		Cycles								
		1	2	3	4	5	6	7	8	
1	Pick up shaft and place in jig	.14	.13	.12	.11	.12	.13	.13	.12	80%
2	Tighten Bolt	.11	.10	.12	.10	.09	.11	.11	.11	95%
3	Bring drill to workpiece	.04	.05	.05	.06	.04	.05	.04	.05	120%
4	drill hole (Hand Free)	.81	.86	.80	.90	.88	.85	.84	.86	90%
5	Raise drill from hole	.05	.05	.04	.06	.05	.05	.04	.06	110%
6	Loosen Bolt	.10	.09	.11	.09	.10	.09	.10	.10	100%
7	Remove shaft from jig	.07	.08	.08	.07	.08	.07	.08	.08	100%
8	Blow out chips from jig	.15	.15	.16	.15	.14	.14	.15	.15	80%

OR

A hotel manager wishes to find out the best way to toast three slices of bread. He has an old fashioned hand operated electric toaster. It can toast one side of two piece of bread at the same time, but it takes two hands to insert or remove each slice of bread. To turn a slice of bread to toast the other side, the operator has to push the toaster door down and permit a spring to shut it back; this operation requires only one hand. Therefore two pieces of bread can be turned at the same time.

The following are the elemental time needed to perform the operations:

Toasting (One side) = .50 min, Turning of toast = .02 min, Toasting (other side) = .50 min

Insertion time = .05 min, Removing time = .05 min

Assume that both hands can perform their tasks with the same degree of efficiency; draw :

(a) A man-machine chart of this operation.
(b) Another chart showing the improvement in the method suggested by you.

Q 10	Exponential smoothing is used to forecast automobile battery sales. Two value of α are examined, $\alpha = 0.8$ and $\alpha = 0.5$. compute the tracking signal and MAD. Evaluate the accuracy of each smoothing constant. Which is preferable? (Assume the forecast for January was 22 batteries.) Actual sales are given below:	20	CO1

Month	Actual Battery Sales	Forecast

January	20	22
February	21	
March	15	
April	14	
May	13	
June	16	