Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

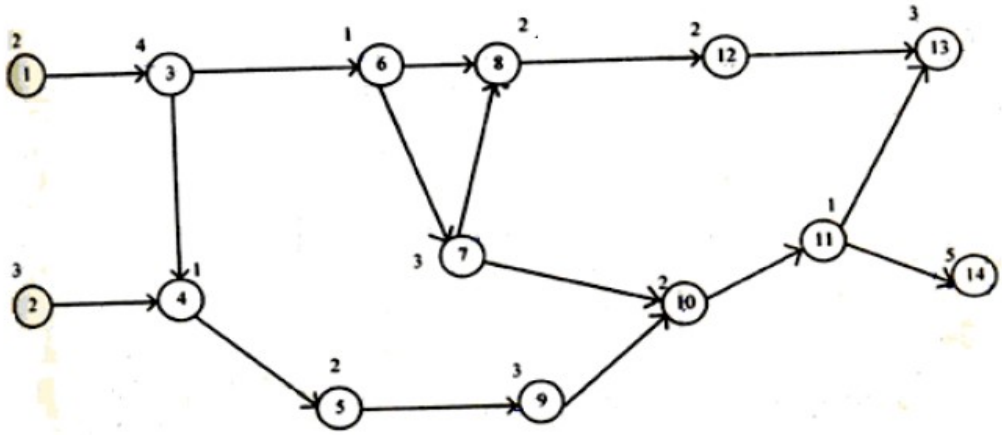
END Semester Examination, May 2019

Programme Name: B.Tech Mechanical and mechanical spl. **Semester : VI**
Course Name : Principles of Industrial Engineering **Time : 03 hrs**
Course Code : IMGT 305 **Max. Marks: 100**
Nos. of page(s) : 3 **Instructions:**

SECTION A

S. No.		Marks	CO
Q1.	Differentiate between Continuous improvement and Traditional approach.	**5**	**CO4**
Q2.	A soldering operation was work-sampled over two days (16 hours) during which an employee soldered 108 joints. Actual working time was 90% of the total time and the performance rating was estimated to be 120 percent. If the contract provides allowance of 20 percent of the total time available. Calculate the standard time for the operation.	**5**	**CO1**
Q3.	Draw the sketch of following five Therbligs: (a) Release load (b) Plan (c) Rest (d) Preposition (e) Unavoidable delay	**5**	**CO1**
Q4.	Differentiate between Job evaluation and Merit rating.	**5**	**CO5**

SECTION B

Q5.	Design the work stations for an assembly line shown below. Use Rank position weighted method. Also calculate the line efficiency. Take cycle time as 10 minutes.  	**10**	**CO2**
Q6.	Briefly explain the Maintenance management along with various types of	**10**	**CO3**

	maintenance.		
Q7.	Explain the following with diagram with respect to Method study: (1) Multiple Activity Chart (2) Process charts and Flow Process charts. **Or** Explain the following: (1) PMTS and its advantages (2) Procedure for Method study	**5** **5** **5** **5**	**CO1**
Q8.	Discuss any ten Principles of an organization.	**10**	**CO5**
	SECTION-C		
Q9.	**1)** The actual tabulated demands for an item for a nine month period (January through September). The supervisor wants to test forecasting methods to see which method was better over the period. Determine: (a) Forecast April through September using a three month moving average. (b) Use simple exponential smoothing with $\alpha = 0.3$ to estimate April through September. (c) Use MAD to decide which method produced the better forecast over the six month period. **2)** Discuss different types of plant layout.	**10** **10**	**CO2**
Q10.	The number of processing errors per 100 purchase orders is monitored by a company with the objective of eliminating such errors totally. Table below shows samples that were selected randomly from all purchase orders. The company is in the process of testing the effects of a new purchase order form that it has designed. The last five samples were made using the new form. Construct a control chart that the company can use for monitoring the quality characteristic selected. Also find the revised control limits if any. What is the effect of the newly designed purchase order form?	**20**	**CO4**

Month	*Actual demand*	*Month*	*Actual demand*
January	110	June	180
February	130	July	140
March	150	August	130
April	170	September	140
May	160		

Sample	Processing Errors	Sample	Processing Errors
1	6	14	3
2	4	15	6
3	2	16	1
4	3	17	5
5	4	18	2
6	7	19	6
7	5	20	4
8	7	21	2
9	11	22	3
10	4	23	2
11	2	24	1
12	5	25	2
13	4		

Or

A soft drink bottling company is interested in controlling its filling operation. Random Samples of size 4 are selected and the fill weight is recorded. Table shows the data for 24 samples. The specifications on fill weight are 350 ± 5 grams (g). Daily production rate is 20,000 bottles.

(a) Find the trial control limits for the *X- bar* and R-bar charts. Draw the control charts as well.

(b) Assuming special causes for out-of-control points, find the revised control limits.

Data: For sample size of 4 the different constant values are A2 = 0.729 , D3 = 0 , D4 = 2.282

Sample	Observations (g)				Sample	Observations (g)			
1	352	348	350	351	13	352	350	351	348
2	351	352	351	350	14	356	351	349	352
3	351	346	342	350	15	353	348	351	350
4	349	353	352	352	16	353	354	350	352
5	351	350	351	351	17	351	348	347	348
6	353	351	346	346	18	353	352	346	352
7	348	344	350	347	19	346	348	347	349
8	350	349	351	346	20	351	348	347	346
9	344	345	346	349	21	348	352	351	352
10	349	350	352	352	22	356	351	350	350
11	353	352	354	356	23	352	348	347	349
12	348	353	346	351	24	348	353	351	352

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