

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name :Industrial Engineering
Subject Code : 4TE04IEN1

Branch: B.Tech (Mechanical)

Semester : 4

Date :11/05/2017

Time : 02:00 To 05:00

Marks :70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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- Q-1 Attempt the following questions: (14)**
- a) **String diagram is used when (01)**
(A) Team of workers is working at a place(B) Material handling is to be done
(C) Idle time is to be reduced(D) All of the above
- b) **Standard time as compared to normal time is (01)**
(A) Greater(B) Smaller(C) Equal(D) There is no such correlation
- c) **Micro-motion study involves following number of fundamental hand motions (01)**
(A) 8(B) 12(C) 16(D) 20
- d) **What does symbol 'D' imply in work study? (01)**
(A) Inspection(B) Delay/temporary storage (C) Transport(D) Permanent storage
- e) **Time study is carried out to determine the time required to complete job by (01)**
(A) A slow worker(B) An average worker (C) A fast worker(D) An apprentice
- f) **For ship vessel industry the following layout is best suited (01)**
(A) Process layout(B) Product layout(C) Fixed position layout(D) Plant layout
- g) **The chart used to monitor variable is (01)**
(A) Range chart (B) P-chart (C) C-chart (D) All of the above
- h) **The specification for double sampling plan are as follows. Draw block diagram to explain the sample plan. (01)**
N= 2400
 $n_1= 150$ $a_1= 5$ $r_1= 8$
 $n_2= 150$ $a_2= 9$ $r_2= 10$
- i) **Write Full name of EMS. (01)**
- j) **Enlist type of Flow Pattern. (01)**
- k) **For Sequencing method, steps of _____ algorithm are mostly used. (01)**
- l) **What is Basic Work Content? (01)**
- m) **What is Rating? (01)**
- n) **What is Reliability? (01)**
- Attempt any four questions from Q-2 to Q-8**

- Q-2 Attempt all questions (14)**
- (a) **Describe: Characteristics of an entrepreneur. (06)**
- (b) **List down methods of Job Evaluation. Explain Factor Comparison Method with any assumptions. (04)**



- (c) Explain Rowan Plan. (04)
 In manufacturing industry, the standard time to complete the job is 8 hours and the hourly wage rate is Rs. 20 per hour. Workers are promised to pay incentive according to Rowan plan. Find bonus payable to worker of time to complete the job is 8, 7,6,5,4,3,2,1 hour respectively.

Q-3 Attempt all questions (14)

- (a) Explain factor affecting productivity for shaft manufacturing company. (06)
 (b) Define following as per Factory Act: (05)
 1. Factory 2. Adolescent 3. Worker 4. Power 5. Manufacturing process.
 (c) What is difference between “Strike” and “Lock out”. (03)

Q-4 Attempt all questions (14)

- (a) In a square plate there is a need of two holes with 3mm and 5 mm diameter size. Use two drilling machine for this operation for 3mm and 5 mm diameter size individually. (07)
 Draw Multiple activity chart as One operator and two machine chart.
 (b) Write steps to find out standard time with equation. (07)
 Find standard time (minutes) using following data:
 Average time of machine element = 360 seconds.
 Average time of manual element = 240 seconds.
 Performance rating = 110%
 Allowances = 10%

Q-5 Attempt all questions (14)

- (a) Explain factors affecting for Actual Site Selection. (07)
 (b) Draw Travel Chart using following data: Give suitable comment as per travel chart. (07)

Sr. No.	Name of Shop	Symbol of Shop
1	Raw Material Store	P
2	Pattern shop	Q
3	Foundry shop	R
4	Shaper section	S
5	Drilling section	T

Product No.	Sequence of Operation	Quantity required per year	Unit load of the product.
I	p-q-r-s	4000	200
II	p-r-s	3000	30
III	p-q-r-s-t	1500	15
IV	p-r-t	1000	10
V	p-t	10000	500

Q-6 Attempt all questions (14)

- (a) Explain types of forecasting. Also explain any four factors affecting forecasting. (07)
 (b) There are seven jobs which are to be processed first on M2 and then on M1. (07)
 Processing time in hours are as under:



Job	A	B	C	D	E	F	G
Machine M1	16	20	20	13	24	02	06
Machine M2	06	24	30	12	20	22	18

Find the optimal sequence and total elapsed time (Minutes).

Q-7

Attempt all questions

(14)

(a) Explain Delphi method of forecasting.

(07)

Following table represents monthly sales data for a product:

Month	Jan.	Feb.	March	April	May	June
Sales	101	104	100	92	105	95

Calculate the exponential smoothing forecasting.

Take smoothing co-efficient $\alpha = 0.2$

Initial forecast = 100

(b) Explain any seven types of inspection.

(07)

Q-8

Attempt all questions

(14)

(a) Explain process capability. Also explain three conditions with neat sketch.

(07)

(b) 10 random samples were taken from the bins produced on lathe. The diameters measured are stated below. Draw control charts and give your comment for process.

(07)

Sample size is four. Take Value of $A_2=0.729$, $D_4= 2.282$.

Sample No.	1	2	3	4	5	6	7	8	9	10
Measurement (Diameter)	14.8	14.9	14.8	15.0	14.6	16.1	15.2	14.8	14.9	14.9
	15.1	14.6	14.9	16.2	15.1	14.7	15.1	15.4	15.9	16.3
	15.0	15.2	15.2	14.9	15.3	14.9	15.3	15.2	15.5	14.8
	14.9	15.1	15.3	14.7	14.8	15.1	15.1	14.9	14.5	15.3

