22657

12223

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define work study. Name the various steps involved in it.

b) State the important functions of Process Engineering.

c) Draw a scatter diagram showing negative corerelation between two variables.

d) Name the various control charts used in Statistical Quality Control.

e) With the help of a block diagram show the basic structure of cause and effect diagram.

f) List out the various factors affecting quality of product.

g) Why 100% inspection is generally not prefered in the industry for mass production.

2. Attempt any THREE of the following: 12

a) Explain in brief different "Recording Techniques" used in method study.

b) Explain "Part Print Analysis". Which information does the process Engineer seeks from it.

c) With the help of a block diagram show the sequence of activities for any quality characteristic.

d) What is the effect of various environment factors such as temperature, noise, light on the efficiency of operator.

3. Attempt any THREE of the following: 12

a) Define process chart, draw the various symbols used in process chart.

b) Define anthropometry and explain its importance.

c) Draw a two handed process chart to assemble a nut and bolt.

d) Classify the man-machine systems.

4. Attempt any THREE of the following: 12

a) State any four advantages of Ergonomics (any 4)

b) Describe any two of the following in connecter with a man-machine system

i) Design of visual display

ii) Design of Controls

iii) Design of workplace

c) Enlist the benefits of Kaizen.

d) What is meant by "5S" Explain each "S" in detail.

5. Attempt any TWO of the following: 12

a) In a project, there are 6 events. Their precedence relationships are A∠B, A∠C, A∠D, B∠F, B∠G, C∠E, E∠F, D∠E, D∠F The activity between different events consume time as mentioned in table below. Identify the critical path. (Ref. Fig. No. 1)

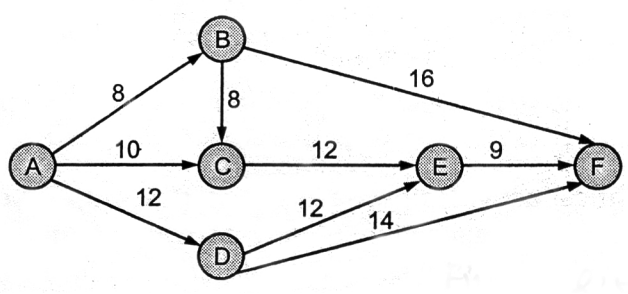

Fig. No. 1

Marks

b) Outline an appropriate process chart for the activity "Replacement of Punctured Tyre".

c) Determine the control limits for $\overline{X}$ and R charts if $\Sigma X = 357.50$, $\Sigma R = 9.90$, Number of subgroups = 20. Given $A_2 = 0.18$, $D_3 = 0.41$, $D_4 = 1.59$ and $d_2 = 3.725$. Also find the process capability.

6. Attempt any TWO of the following: **12**

a) Explain any six objectives of line balancing.

b) Number of defects found in an inspection of 10 assemblies are 2, 3, 2, 5, 2, 3, 5, 3, 0, 1 respectively. Draw C Chart and conclude.

c) Two machines producing components are checked up for the statistical stability. Draw the 'P' chart for both machines and comment upon the process. Sample size for both machines are 200.

Machine A

Sample No.	1	2	3	4	5	6	7	8	9	10
Defectives	25	28	30	30	20	29	31	26	31	27

Machine B

Sample No.	1	2	3	4	5	6	7	8	9	10
Defectives	11	08	22	15	12	27	10	15	10	02