

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:2161907****Date:08/06/2022****Subject Name:Industrial Engineering****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1** (a) State the objectives of a good plant layout **03**
 (b) What are the various tools and techniques to improve productivity? **04**
 (c) Differentiate between product layout and process layout by taking suitable example **07**
- Q.2** (a) List the different equipments used for time study and explain fly back timing method. **03**
 (b) Prepare a list of Therbligs used in the industry. (Any Eight) **04**
 (c) A work sampling study was conducted to establish the standard time for an operation. The observations of the study is given below: Total number of observations = 160 Manual (hand controlled work) = 14 Machine controlled work = 106 Machine idle time = 40 Average performance rating = 80% No. of parts produced = 36 Allowance for personal needs and fatigue = 10% Study conducted for 3 days Available working hours per day = 8 hrs Calculate the standard time per piece **07**
- OR**
- (c) State the difference between a chart and a diagram? Explain the FPC and OPC **07**
- Q.3** (a) Explain following term with respect to O.C. curve : **03**
 (i) Producer's risk (ii) Consumer's risk
 (b) What is Productivity? Discuss the Ineffective time within the control of the worker **04**
 (c) Following are the readings of diameters taken for pins manufactured on the lathe machine. Draw X-bar and R chart for the given data and state whether the process is in control. **07**

Sample	1	2	3	4	5
1	5.02	5.01	4.94	4.99	4.96
2	5.01	5.03	5.07	4.95	4.96
3	4.99	5.00	4.93	4.92	4.99
4	5.03	4.91	5.01	4.98	4.89
5	4.95	4.92	5.03	5.05	5.01
6	4.97	5.06	5.06	4.96	5.03
7	5.05	5.01	5.10	4.96	4.99
8	5.09	5.10	5.00	4.99	5.08
9	5.14	5.10	4.99	5.08	5.09
10	5.01	4.98	5.08	5.07	4.99

OR

- Q.3** (a) What are the penalties kept under Payment of Wages Act? **03**
 (b) What is EBQ? How it can be determined? **04**

- (c) Define acceptance sampling. Explain double sampling plan. When do you apply double sampling in place of single sampling? **07**
- Q.4** (a) Define wages and explain in detail various types of incentives plans. **03**
 (b) What is 'Job Evaluation' and why it is necessary to carry out 'Job Evaluation'? **04**
 (c) The sales of a product during the last four years were 860,880,870,890 units. The forecast for the fourth year was 876 units. If the forecast for the fifth year using exponential smoothing is equal to the forecast using a 3 period moving average. Find the value of smoothing constant (α). **07**
- OR**
- Q.4** (a) Compare the production systems based on their characteristics **03**
 (b) Define the following: (i) Production (ii) Planning (iii) Control iv) Scheduling **04**
 (c) What do you mean by line balancing? What is the procedure for line balancing? **07**
- Q.5** (a) Explain the importance and necessity of labour laws. **03**
 (b) Discuss major provisions of 'Workman's compensation Act, 1925'. **04**
 (c) Explain the phases of production Planning and Control. **07**
- OR**
- Q.5** (a) List important qualities of an entrepreneur **03**
 (b) What is pre-determined motion and time systems (PMTS)? How it is used for carrying out time study? **04**
 (c) List various factors contributing to failure of entrepreneurial ventures **07**
