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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S, FE) / S6 (PT) (S, FE) Examination June 2023 (2015 Scheme)



Course Code: ME404

Course Name: INDUSTRIAL ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

Marks

- 1 a) List any four roles of an industrial engineer (4)
- b) Describe any three contribution by F W Taylor to industrial engineering (3)
- c) How manufacturing differs from production? (3)
- 2 a) Describe the stages of product development (3)
- b) With an example differentiate engineering and commercial prototypes (3)
- c) Given the fixed cost as Rs 40000. Unit variable cost is Rs 24 and selling price per unit is Rs 44. Determine the BEP sales and volume (4)
- 3 a) Illustrate the principle of minimum distance and cubic space utilization (4)
- b) Which type of production layout is recommended for the production of televisions and mobile phones? Why? (3)
- c) List the advantages and limitations of electrical overhead travelling cranes (3)
- 4 a) Illustrate preventive, predictive and break down maintenance with examples (3)
- b) What is meant by payback period? If an equipment cost Rs 25000 and the income receivable for the first, second, third, fourth and fifth years are Rs8000, Rs 8000, Rs 14000, Rs 10000 and Rs 9000 and the scrap value is Rs 2000, calculate the payback period (4)
- c) List the reasons of replacement (3)

PART B

Answer any three full questions, each carries 10 marks.

- 5 a) List any four objectives of method study (4)
- b) Illustrate any three principles of motion economy applicable to human hands (3)
- c) With an example illustrate the use of left and right hand flow process chart (3)
- 6 a) What are therbligs? What are the applications of therbligs? (3)

- b) Define observed time, normal time and standard time (3)
- c) The observed times of three consecutive work elements of a job are given as 0.2 minutes, 0.3 minutes and 0.5 minutes respectively with the performance ratings 85%, 90% and 80% each. Compute the standard time, assuming a combined rest and personal allowance as 15% and contingency allowance as 5%. (4)
- 7 a) What are the causes of work related stress? How it can be remedied? (4)
- b) What are the symptoms and effects of fatigue? (3)
- c) Sometimes managers use grapevine as an effective means of communication. Elaborate the concept of grapevine (3)
- 8 a) Classify the safety devices and equipments used in industries (3)
- b) Define industrial dispute. List the causes of dispute (4)
- c) Give any three situations / cases where workers can participate effectively in managing the firm (3)

PART C

Answer any four full questions, each carries 10 marks.

- 9 a) Distinguish between production planning and production control. How they are related? (3)
- b) Explain the application fields and limitations of job order production (4)
- c) With the help of examples distinguish finite capacity scheduling from infinite capacity scheduling (3)
- 10 a) Select appropriate product and explain the strategies adopted during the introduction and growth stages (4)
- b) How feedback and feed forward controls differ? (3)
- c) Is there any difference between mass and flow production? Illustrate with appropriate examples (3)
- 11 a) Sketch and explain the use of a Gantt bar chart (3)
- b) Enumerate the factors deciding the routing operation (3)
- c) If the annual demand is 20000 items and the ordering cost is Rs 1000 per order and the unit carrying cost per year is Rs 40, what is the economic order quantity? Assume deterministic model with no stock out and buffer stock (4)
- 12 a) Define quality. What are the factors affecting quality? (4)
- b) Explain the concept of process capability (3)
- c) Describe any two types of destructive testing methods (3)

- 13 a) Describe the acceptance sampling method used in SQC (3)
b) With suitable example illustrate the use of any one type of control chart (3)
c) What is meant by failure? Classify failures (4)
- 14 a) Three identical resistors are having individual reliability value of 0.9. Calculate the overall reliability, if they are connected in 1) Series 2) Parallel (4)
b) What are the different types of life testing conducted for a product such as passenger car? (3)
c) Write short note on six sigma concept (3)
