

**INDUSTRIAL ENGINEERING
(MECH 3224)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

**Group – A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) The production cost per unit can be reduced by
 - (a) producing more with increased inputs
 - (b) producing more with the same inputs
 - (c) eliminating idle time
 - (d) minimizing resource costs.
 - (ii) What may be a disadvantage of process layout?
 - (a) Low product flexibility
 - (b) Complex flow can be difficult to control
 - (c) Easily disrupted
 - (d) Large investment cost.
 - (iii) Work study is concerned with
 - (a) improving present method and finding standard time
 - (b) motivation of workers
 - (c) improving production capacity
 - (d) improving production planning and control.
 - (iv) “Value” for value engineering and analysis purposes is defined as
 - (a) purchase value
 - (b) saleable value
 - (c) depreciated value
 - (d) function / cost.
 - (v) Which plant layout involves the equipment, machinery and people move as necessary?
 - (a) Product layout
 - (b) Process layout
 - (c) Combination layout
 - (d) Fixed layout.
 - (vi) Which one of the following techniques is used for determining allowances in time study?
 - (a) Acceptance sampling
 - (b) Linear regression
 - (c) Performance rating
 - (d) Work sampling.

- (vii) Merit Rating is the method of determining worth of
 (a) a job (b) an individual employee
 (c) a particular division in workshop (d) machine.
- (viii) To determine where the plant should be located for maximum operating economy and effectiveness, refers to which one of the following?
 (a) Plant layout (b) Plant location
 (c) Capacity planning (d) Capacity requirement.
- (ix) Which one of the following chart gives simultaneous information about the progress of work and machine loading?
 (a) Process chart (b) Machine load chart
 (c) Man-machine chart (d) Gantt chart.
- (x) The correct sequence of operations in production planning and control is
 (a) routing-scheduling-dispatching-followup
 (b) scheduling-routing-dispatching-followup
 (c) dispatching-routing-scheduling-followup
 (d) routing-scheduling-followup-dispatching.

Group – B

2. (a) How do you define the term “Industrial Engineering (IE)”? Mention in brief the functions of IE.
- (b) Briefly discuss the various factors which influence the design of a product.
(2 + 4) + 6 = 12
3. (a) What is meant by the term “Value Analysis”? How do you distinguish between the terms “value analysis” and “value engineering”?
- (b) Calculate the vendor rating for the following: Where the items are same procured from different suppliers.

Supplier's Data	A	B	C
Quantity Supplied	90	80	75
Quantity Accepted	78	80	70
Price of each item	Rs.4	Rs.4.20	Rs.3.90
Delivery Promised	6 weeks	6 weeks	6 weeks
Actual Deliveries made in	8 weeks	6.2 weeks	7 weeks

Weightage for quality = 70%; price = 20%; delivery = 20%.

(2 + 4) + 6 = 12

Group – C

4. (a) Name any six factors that must be considered while selecting a location for a factory.
- (b) Briefly discuss about any two of those above-mentioned factors which are to be considered while selecting a location for a factory.

6 + 6 = 12

5. (a) Elaborate very briefly about any three advantages of single-story factory building.
- (b) Mention any four advantages of process layout.

6 + 6 = 12

Group – D

6. (a) What do you understand by the term “Production Planning & Control (PPC)?” Mention how manufacturing cost is controlled by the function of PPC.
- (b) State the reasons that may lead a firm to make a product or component in-house instead of purchasing it.

(2 + 4) + 6 = 12

7. (a) Mention in brief the benefits and limitations of PPC.
- (b) Discuss PPC function with respect to Job Production and Batch Production.

6 + 6 = 12

Group – E

8. (a) For a certain element of work, the basic time is established to be 20 seconds. If for three observations, a time study observer records ratings of 100, 125 and 80 respectively, on a “100-normal scale”, what are the observed ratings?
- (b) An 8-hours work measurement study in a plant reveals the following: units produced = 320 nos.; Idle time = 15%; Performance rating = 120%; Allowances = 12% of normal time. Determine the standard time per unit produced.

6 + 6 = 12

9. (a) How do you define the term “Time Study”? Discuss the objectives of Time Study.
- (b) Calculate the standard production per shift of 8 hours duration with the following data : observed time per unit = 5 minutes; Rating factor = 120%; Total Allowances = 3 3.33% of normal time.

(2 + 4) + 6 = 12

Department & Section	Submission Link
ME	https://classroom.google.com/c/Mjk4ODcyNjQwODI1/a/Mjl2MjlzMTY0MzUx/details