

Ex/IEBT/Prod/T/321/2018

JADAVPUR UNIVERSITY  
B.Tech Instrumentation and Electronics  
Engineering Examination – 2018  
(3<sup>rd</sup> Year – 2<sup>nd</sup> Semester)

**Industrial Management**

Time : Three Hours

Full Marks : 100

**Answer Part – A (Compulsory) and any Five from Part – B & Part – C taking  
at least two from each Part (either Part – B or Part – C) (10+5x18=100)**

**Part – A (Compulsory) (1x10=10)**

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1. (a) Work study is done with the help of (1x10=10)  
(i) Process chart  
(ii) Material handling  
(iii) Stop watch  
(iv) All of the above  
(v) None of the above
- (b) PERT has the following time estimate  
(i) one time estimate  
(ii) two time estimate  
(iii) three time estimate  
(iv) four time estimate  
(v) none of them
- (c) CPM has the following time estimate  
(i) one time estimate  
(ii) two time estimate  
(iii) three time estimate  
(iv) four time estimate  
(v) none of them
- (d) Father of industrial engineering is  
(i) F W Taylor  
(ii) H L Gantt  
(iii) F B Gilberth  
(iv) R M Barnes  
(v) None of the above
- (e) Break-even analysis consists of  
(i) Fixed cost  
(ii) Variable cost  
(iii) Fixed and variable cost  
(iv) Operation cost  
(v) None of the above
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- (f) Which of the following is independent of sales forecast  
 (i) Productivity  
 (ii) Inventory control  
 (iii) Production planning  
 (iv) Capital budgeting
- (g) Statistical quality control techniques are based on the theory of  
 (i) Quality  
 (ii) Statistics  
 (iii) Probability  
 (iv) All of the above  
 (v) None of the above
- (h) A-B-C analysis is used in  
 (i) CPM  
 (ii) PERT  
 (iii) Inventory control  
 (iv) All of these
- (i) Gantt chart provides information about the  
 (i) Material handling  
 (ii) Proper utilization of manpower  
 (iii) Production schedule  
 (iv) Efficient working of machine
- (j) Motion study involves analysis of  
 (i) Actions of operator  
 (ii) Layout of work place  
 (iii) Tooling and equipment  
 (iv) All of the above  
 (v) None of the above

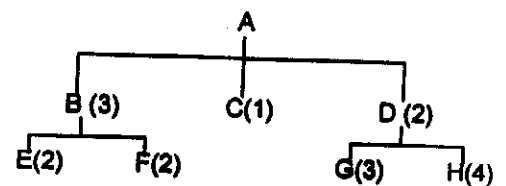
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### Part – B

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2. (a) What is material management? State its objectives. (5+5+4+4=18)  
 (b) Explain different functions of material management.  
 (c) State the objectives of MRP – I & MRP – II.

(d) Product structure of a end product A is shown in the following figure. What are the requirements of various lower level items for producing 100 units of A.



3. (a) How the cost of production can be minimised?

(3+5+10=18)

- (b) Give a brief description on Break-even analysis.

(c) The fixed costs for the year 2014-15 are Rs. 1,00,000. The estimated sales are Rs. 3,00,000. The variable cost per unit for the single product made is Rs.5. If each unit sells at Rs. 30 and the number of units involved coincides with expected volume of output, construct the break-even chart:

- (i) Determine BEP.
- (ii) Determine the profit at a turn-over of Rs. 1,80,000.
- (iii) Find the margin of safety.
- (iv) Measure the angle of incidence.

4. (a) Describe briefly the importance of maintenance in an industry.

(5+5+4+4=18)

- (b) State the objectives and advantages of preventive maintenance.
- (c) Describe in brief the economic aspects of maintenance.
- (d) Describe the relationship between preventive maintenance and break-down maintenance.

5. (a) Describe the principles of scientific purchasing.

(3+6+6+3=18)

- (b) Describe in brief the responsibilities of purchasing department.
- (c) Name and discuss the various buying techniques.
- (d) Give a typical organization of a purchasing department.

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### Part – C

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6. (a) What is Economic Order Quantity? Derive the formula for determining EOC for inventory model with uniform demand.

(3+5+10=18)

(b) A company requires 16000 units of raw material costing Rs. 2 per unit. The cost of placing a order is Rs. 45 and the carrying costs are 10% per year per unit of the average inventory. Determine; (i) the economic order quantity (EOQ), (ii) cycle time, and (iii) total variable cost of managing the inventory.

[Turn Over]

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7. (a) What is the role of forecasting in the development of any industry?  
 (b) Describe the importance of sales forecasting.  
 (c) What are the processes of sales forecasting. (4+4+4+6=18)  
 (d) Demand for generating sets of a particular size in the past six months, in a firm was as follows :

January	300	March	400	May	450
February	350	April	400	June	500

Forecast the demand for July, based on

- (i) 6 months moving average.  
 (ii) 4 months moving average.
8. (a) Define the terms CPM and PERT. What are the differences between CPM and PERT? (3+3+12=18)

(b) A small engineering project consists of six activities. The three time estimates in number of days for each activity are given below.

Sl No	activity	$t_o$	$t_m$	$t_p$
1	1-2	2	5	8
2	2-3	1	1	1
3	3-5	0	6	18
4	5-6	7	7	7
5	1-4	3	3	3
6	4-5	2	8	14

- (i) Calculate the values of expected time( $t_e$ )  
 (ii) Draw the network diagram and mark  $t_e$  on each activity  
 (iii) Calculate EST and LFT and mark them on the network diagram  
 (iv) Calculate total slack for each activity  
 (v) Identify the critical path and mark on the network diagram.
9. (a) Define the term quality and state the various factors which affect product quality. (4+4+10=18)  
 (b) Discuss the differences between 'Quality Control' and 'Inspection'.  
 (c) Control charts for  $\bar{X}$  are to be prepared for a certain dimension of component. The subgroup size is 4. After 20 subgroups it is found that  $\sum \bar{X} = 825.6$  mm and  $\sum R = 5.6$  mm. Compute the central line and the control limits for  $\bar{X}$  chart. Take  $d_2 = 2.059$ . If the specifications are  $41.0 \pm 0.4$  mm and the process is in control and is normally distributed, can it meet the specification requirement?