Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS / MBA (NEW) / SEM-2 (FT) / MB-204 / 2011

2011

PRODUCTION & OPERATIONS MANAGEMENT

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words

as far as practicable.

GROUP – A
### (Multiple Choice Type Questions)

1.   Choose the correct alternatives for any *ten* of the following :

$10 \times 1 = 10$

   i)   One of the major objective of scheduling is to

   a)   meet due dates

   b)   measure the deviation from planning

   c)   estimate correct requirement

   d)   none of these.

   ii)   Which of the following is not consistent with the concept of TQM ?

   a)   Organizational leadership

   b)   Quality control departments

   c)   Continuous improvement

   d)   Customer focus.

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iii) Layout of a hospital where a patient receives a number of medical services is

a) Product layout   b) Fixed-position layout

c) Process layout   d) none of these.

iv) A line or product layout generally provides the advantages of

a) lower levels of WIP inventories

b) lower material handling costs

c) both (a) and (b)

d) none of these.

v) In locating fire-brigade service, the major criteria would be

a) to minimize transport or travel costs of the fire engines

b) to minimize the response time

c) to maximize the utilisation of the invested facilities

d) to ensure availability of water.

vi) Preventive maintenance refers to

a) system of scheduled and planned maintenance to minimize problem of breakdown

b) the repair work undertaken after the failure of machine or equipment

c) the maintenance undertaken on the prediction of any fault in the machine

d) none of these.

vii) Statistical quality control is done to

   a) prevent any defective product from going out of the factory

   b) observe the trend of product quality

   c) initiate corrective action if quality trend shows and adverse pattern

   d) none of these.

viii) Which of the following will not be included in calculating inventory carrying cost ?

   a) Capital cost   b) Insurance cost

   c) Obsolescence cost   d) Transportation cost.

ix) The control chart which is used in a situation where fraction defectives are the criteria for acceptance or rejection is called

   a) $\overline{X}$-chart   b) R-chart

   c) P-chart   d) C-chart.

x) The desired objective of Production Management is

   a) use cheap machinery to produce

   b) to earn good profits

   c) optimum utilization of available resources.

xi) Man-Machine Chart is used in

   a) job scheduling   b) routing

   c) plant layout designing   d) none of these.

xii) Batch Production System is adopted when

   a) 'volume' is very large and 'variety' is less

   b) 'volume' is small and 'variety' is large

   c) both the 'volume' and 'variety' are medium.
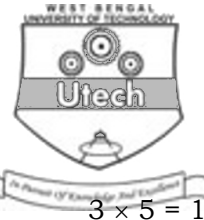
GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following. $3 \times 5 = 15$

2. In a work measurement exercise, a worker was observed for 30 minutes continuously. In this period, the worker completed 42 parts. The performance rating for the worker is 130. If the company allows 15% as a fatigue and personal time allowance, what should be the

    a)   Normal time for the job   3

    b)   Standard time for the job   2

3. a)   What is selective inventory control ?   2

    b)   Discuss in brief how ABC classification helps in inventory control.   3

4. a)   What is productivity and why is it important ?   2

    b)   An operation has 10% scrap rate. As a result 72 acceptable pieces are produced per hour. What is potential increase in labour productivity that could be achieved by eliminating the scrap ?   3

5. Discuss the different types of costs associated with inventory management.

6. a)   How does Internal Customer concept help in improving Quality, Cost & Delivery ?

    b)   Improvement in quality of production increases productivity and profitability. Elucidate.   3 + 2

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. $3 \times 15 = 45$

7. a)   State the different options a company have in matching demand and capacity.

b) Planners for a company that makes several models of Filters are about to prepare the plan that will cover six months. They have assembled following information :

Month	1	2	3	4	5	6
Forecast	200	200	300	400	500	200

Relevant costs are as follows :

Production cost in regular time production	Rs. 200.00 per filter
Inventory carrying cost	Rs. 100.00 per filter per month on average inventory
Back order costs	Rs. 500.00 per filter per month

They now want to evaluate a plan that calls for a steady rate of regular-time output. They intend to start with zero inventories on hand in the first month. There are 15 workers and each can produce 20 filters per month in regular-time production. You are required to submit the plan in detail and compute the total costs associated with it.   3 + 12

8. a) Discuss the basic costs associated with inventories.

b) Discuss how these costs behave in Quantity Discount model with changes in order size.
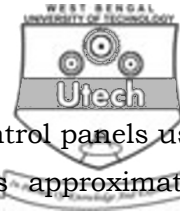
c) A company manufacturing electrical control panels uses 4000 toggle switches a year. It costs approximately Rs. 3,000.00 to prepare an order and receive it. Carrying costs are 40 per cent of purchase price per unit on annual basis. Determine the optimal order quantity and total annual cost considering switches are priced as follows :

Range of Order	Unit price (Rs.)	
1 to 499	90.00	
500 to 999	85.00	
1000 and above	80.00	5 + 2 +8

9. a) What is Standard time ?

b) Discuss the process of computation of standard time from a time-study exercise.

c) Why is the performance rating factor used in such a computation ?

d) A time study was conducted on a job that contains four elements. The observed times and performance ratings are shown in the following table for six cycles.

Elements	Performance Rating (%)	Observed time (mins)					
		1	2	3	4	5	6
1	90	0·44	0·50	0·43	0·45	0·48	0·46
2	85	1·50	1·54	1·47	1·51	1·49	1·52
3	110	0·84	0·89	0·77	0·83	0·85	0·80
4	110	1·10	1·14	1·08	1·20	1·16	1·26

Complete the standard time. 1 + 3 + 1 + 10

10. a) What do you mean by PERT in Project analysis ?

b) What are the three time estimates related to PERT ?

c) Write down the difference between PERT and CPM.

d) A firm is considering to launch of a new product in the national market. This project consists of nine major activities. The firm does not have adequate prior experience of similar project. The project is riddled with considerable uncertainty due to political and public interference. The precedence relationship and the three possible time estimates of each activities are given in the table below :

Activity	Predecessor Activity	Optimistic Duration (Weeks)	Most Likely Duration (Weeks)	Pessimistic Duration (Weeks)
A	None	2	4	6
B	None	2	3	10
C	B	4	7	10
D	A	4	5	12
E	B	2	7	12
F	C, D	3	4	5
G	C, D	6	8	10
H	E, F	6	7	14
I	G, H	2	3	16

i) Draw the network of the above project.

ii) What is the expected project completion time ?

iii) Identify the critical activity and critical path.

iv) Determine the float of each activity.   3 + 3 + 3 + 6

11. Write short notes on any *three* of the following :   3 × 5

a) Zero defect

b) Use of PERT in scheduling a production plan

c) ISO 9000

d) JIT

e) MRP II.

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