

OPERATIONS MANAGEMENT AND STRATEGIC MANAGEMENT

Time Allowed: 3 Hours

Full Marks: 100

The figures in the margin on the right side indicate full marks.

All sections are compulsory. Each section contains instructions regarding the number of questions to be answered within the section.

All working notes must form part of the answer.

Wherever necessary, candidates may make appropriate assumptions and clearly state them in the respective answer.

Section-A

This section contains Question No. 1. All parts of this question are compulsory. Answer the following questions:

1. Choose the correct answer from the given alternatives. (You may write only the Roman numeral and the Alphabet chosen for your answer): 2×15=30

- (i) With reference to the operations of a manufacturing company, one of the important decisions "How to reach the products to the customers?" Is related to which one?
- (A) Quality Management
 - (B) Inventory Management
 - (C) Maintenance Management
 - (D) Distribution ✓
- (ii) Which one of the following is associated with the question "How much space and capacity does each economic activity centre need?"
- (A) Facility location
 - (B) Facility layout
 - (C) Capacity Planning ✓
 - (D) MRP
- (iii) The non-linear iterative process that seeks to understand users needs challenge assumptions, redefine problems and create innovative solutions to prototype and test, is called:
- (A) Product design
 - (B) Product Mix
 - (C) Design thinking ✓
 - (D) Product Life Cycle

- (iv) Any solution that also satisfies the non-negative restrictions of the general linear programming problem is called a :
- (A) Basic Solution
 - (B) Feasible Solution ✓
 - (C) Basic Feasible solution
 - (D) Optimal feasible solution

- (v) ISO Standards are reviewed every:
- (A) Year
 - (B) 2 Years
 - (C) 5 Years ✓
 - (D) 10 Years

- (vi) ABS Ltd., a manufacturing Company has a production line consisting of five work centers in series with individual capacity in units per shift as are given. The actual output of line is 270 units per shift.

Work Centre	P	Q	R	S	T
Capacity/Shift	350	320	360	325	300 ✓

Identify the bottle neck centre

- (A) Work Centre P
 - (B) Work Centre R
 - (C) Work Centre T ✓
 - (D) Work Centre S
- (vii) Under Maintenance management, two types of costs and need to be balanced-one is cost of premature replacement, other is cost of:
- (A) Purchase of Raw Materials
 - (B) Breakdown ✓
 - (C) Purchase of finished goods
 - (D) None of the above
- (viii) The technique which involves developing a model of real phenomenon and then performing experiments on the model evolved, is referred to as:
- (A) Transportation
 - (B) Assignment
 - (C) Simulation
 - (D) Queuing ✓

- (ix) Which one of the following refers to the job-specific goals of each individual employee?
- (A) Performance Objectives
 - (B) Personal Objectives ✓
 - (C) Professional Objectives
 - (D) Organization Genomics
- (x) Which one of the following is related to a situation when consumers have a preference for the products of established companies?
- (A) Economics of Scale
 - (B) Brand Loyalty ✓
 - (C) Customer switching costs
 - (D) Absolute cost advantages
- (xi) The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed is called:
- (A) Transformation
 - (B) Reprocessing
 - (C) Total Quality Management
 - (D) Business Process Re-engineering (BPR) ✓
- (xii) A collection of data that is huge in volume and is growing exponentially with time is called:
- (A) Big data ✓
 - (B) Huge data
 - (C) Block Chain
 - (D) Cloud data
- (xiii) The expected time for an activity of project B is 7 days. If the optimistic and pessimistic time are 3 days and 15 days respectively, what will be the most likely time of the activity?
- $$t_2 = \frac{P + O + 4M}{6}$$
- (A) 10 days
 - (B) 6 days ✓
 - (C) 12 days
 - (D) None of these

- (xiv) In SWOTC Analysis, the Letter 'C' denotes :
- (A) Champions
 - (B) Characteristics
 - (C) Challenges ✓
 - (D) Core Values
- (xv) While developing KRAs (Key Result Areas) following can be the hurdle(s):
- (A) Lack of clarity
 - (B) Distractions
 - (C) Top-Down Imposition Areas
 - (D) All of the above ✓

Section-B

Answer any five questions out of seven questions given. Each question carries 14 marks.

14×5=70

2. (a) "Recent trends in Production and Operations Management related to global competition and the impact it has on manufacturing firms." **In this context**, state in brief the recent trends in production and operations management. (Any seven) 7
- (b) You are working as a Production Manager in a Manufacturing unit. You are required to determine whether resources are to be organized around products or process in order to implement the flow strategy. **In this context**, describe in brief the basic process types to be chosen. (any seven) 7
3. (a) **Summarize** the Basic types of Production Control. 7
- (b) The following table gives the age of cars of SKODA Make and its Annual Maintenance Cost.

Age of Cars in Years (X)	2	4	6	8
Maintenance cost (in thousand of ₹)(Y)	10	20	25	30

Required:

- (a) **Fit a** Linear Regression of Y on X
- (b) **Estimate:** (i) Maintenance Cost for Age of Cars of 10 years
(ii) Age of car in years for Maintenance cost of ₹ 50000

375000

$$y = a + bx$$

$$\sum y = a + b \frac{\sum x}{n}$$

$$b = \frac{\sum xy}{\sum x^2}$$

$$\sum y = a + b \sum x$$

4. (a) in a job shop operation of ZINT Ltd., five jobs may be performed on any four machines. The hours are required for each job on each Machine are presented in the following table.

Job \ Machine	1	2	3	4
A	6	2	5	2
B	2	5	8	7
C	7	8	6	9
D	6	2	3	4
E	9	3	8	9

The plant foreman would like to assign the jobs so that the total time is minimized.

Required:

Develop the Optimal assignment of jobs to Machines and Assess the Corresponding Total Time (in hours) and also identify the job which will be left unassigned. 9-10 7

- (b) RAGON (P) & Co. has a single machinist in a repair shop. He works eight hours a day and on an average four machines break each day. It takes on the average one hour to repair a machine. Simple queue conditions exist.

Required:

- 8 hrs/day $\frac{8}{1} = 8$
- (i) Identify the expected number of machines on the repair shop. 8, 46
- (ii) Determine the expected number of machines in the shop on which the machinist has not started to work.
- (iii) Assess the average down-time (waiting for repairs or undergoing repairs) per machine?
- (iv) The average time a machine waits for service would be how much? 7

5. (a) The Management of BB HOTEL IN is considering periodic replacement of light bulbs fitted in its rooms. There are 200 rooms in the hotel and each room has 5 bulbs. The Management is conducting a study on the life of the light bulbs. The following mortality rates have been observed for the light bulbs.

Month of USE	1	2	3	4	5
Percent of bulbs failing by that month	10	15	25	30	20

There are 1000 light bulbs in use and it costs ₹ 100 to replace an individual bulb which has burnt out. If all bulbs were replaced simultaneously, it would cost ₹ 20 per bulb. It is proposed to replace all bulbs at fixed intervals, whether or not they have burnt out and to continue replacing burnt out bulbs as they fail.

Required:

- (i) Examine the number of light bulbs to be replaced every month.
 - (ii) Calculate the average monthly cost (₹) of individual replacement.
 - (iii) Identify at what interval of time the Management of BB Hotel IN should replace all the light bulbs and which policy of replacement would be economical. 7
- (b) TINTEX LTD., a construction company has an opportunity to submit a bid for the construction of a new apartment building. From specifications provided by the developer, a PERT Network for the project has been developed and the estimate of optimistic, most likely and pessimistic, completion duration in days (a, m and b respectively) for each activity are shown below:

Activity and Identification	Estimated Time in Days			
		Optimistic (a)	Most likely (m)	Pessimistic (b)
A	1-2	15	20	25
B	1-3	20	25	30
C	2-3	6	10	14
D	2-4	8	12	16
E	3-4	2	6	10
F	4-5	6	10	14

Required:

- (i) Assess the expected Time (in days) of the project.
 - (ii) Draw the Project Network and identify all paths through it.
 - (iii) Identify the Critical Path with its duration and assess the Total Float and Free Float of each activity of the Project.
6. (a) Explain in brief the various important issues that need to be kept in mind while setting up objectives of an organization. SMART 7
- (b) "In spite of the fact that Cloud computing has huge benefits yet, it has its own causes of Concern". In this context, examine the Demerits of Cloud computing. (Any seven). 7
7. (a) Examine Various Mechanisms that may be employed for identifying Strategic alternatives in the medium and large organizations. 7
- (b) "The value chain describe the categories of activities within and around an organization which create a product or service". In this context, demonstrate the activities involved in value chain of an organization.

Primary → Inbound Logistics, Out, op, Marketing, After Sale
Secondary/Service → Tech, HR, Social & Environ. Serv

8. (a) "While designing a Control System, top management should remember that controls should follow strategy". In this context enumerate the recommended guidelines for proper control. 7
- (b) Demonstrate in brief some of the areas that have the ability to create goal congruence. 7
-