

INTERMEDIATE EXAMINATION

December 2024

P-9(OMSM)
Syllabus 2022

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.

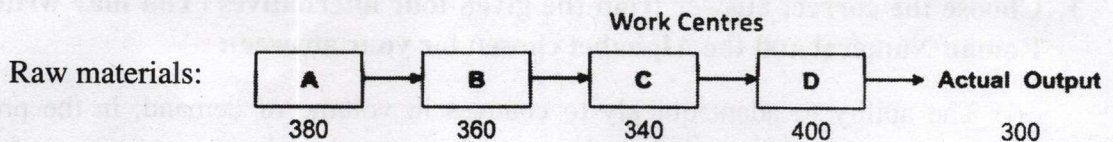
1. Choose the correct answer from the given four alternatives (You may write only the Roman Numeral and the Alphabet chosen for your answer): **2×15=30**

- (i) The ability to adapt quickly to changes in volume of demand, in the product mix demanded, and in product design or in delivery schedules, is sometimes referred to as
- (A) Re-Engineering
 - (B) Business Process Restructuring
 - (C) Agile Manufacturing
 - (D) Right Sizing
- (ii) Which one of the following is associated with the configuration of departments, work centres and equipment and machinery, with focus on the flow of materials or work through the production system?
- (A) Facility Location
 - (B) Facility Layout
 - (C) Capacity Planning
 - (D) Process Design
- (iii) In which one of the following phases of the product life cycle, organisations get engaged in aggressive promotional and pricing program?
- (A) Introduction
 - (B) Growth
 - (C) Maturity
 - (D) Decline

(iv) The Annual Carrying Cost of Material ZB is ₹ 3.60 per unit and its Total Carrying Cost is ₹ 9,000 per annum. If there is no Safety Stock of Material ZB, what will be the Economic Order Quantity (EOQ) for Material ZB?

- (A) 5000 units
- (B) 6000 units
- (C) 6500 units
- (D) 4000 units

(v) ZOOS Ltd., a manufacturing firm, has four Work Centres A, B, C & D in series with individual capacities in units per day shown in the figure below:



What is the System Efficiency?

- (A) 75.25%
- (B) 80.33%
- (C) 99%
- (D) 88.23%

(vi) A cement factory of SITON (C) Ltd., in Madhya Pradesh works 7 days a week in 3 shifts per day having maintenance in the first shift of around 2 hours. It has roughly 100 workers which produces only pozzolanic properties cement better known as PPC. The output per month is around 2500 tonnes of PPC. What will be productivity per worker?

- (A) 20 tonnes
- (B) 30 tonnes
- (C) 25 tonnes
- (D) 15 tonnes

- (vii) For Quality Assurance in Design, Production, Installation and Servicing the _____ Model is used.
- (A) ISO 9002
 - (B) ISO 9001
 - (C) ISO 9003
 - (D) None of the above options
- (viii) This _____ provides the broad “DATA”, from which to identify key drivers of change.
- (A) SWOT Analysis
 - (B) BCG Matrix
 - (C) PESTEL Analysis
 - (D) Critical Success Factors
- (ix) Which one of the following cannot be closely associated with the “Red Ocean Strategy”?
- (A) Boat the Competition
 - (B) Make the Value Cost trade-off
 - (C) Make the Competition irrelevant
 - (D) Exploit Existing Demand
- (x) The process of _____ requires co-ordination across the entire organization and involves business culture changes.
- (A) Digital Strategy
 - (B) Digitization
 - (C) Digital Transformation
 - (D) Data Aggregation
- (xi) Forecasting the weather is an example of _____.
- (A) Narrow AI
 - (B) General AI/Human-Level
 - (C) Super AI
 - (D) Deep-Learning

- (xii) Which type of Production Control is most prominently applied in the industries like textiles, and book & magazine printing industries?
- (A) Batch Control
 - (B) Load Control
 - (C) Order Control
 - (D) Block Control
- (xiii) The Work Breakdown Structure is typically developed in which one of the following phases of the project management life cycle?
- (A) Project Initiation Phase
 - (B) Project Planning Phase
 - (C) Project Quality Management Phase
 - (D) Execution Phase
- (xiv) Strategy Formulation is characterized by—
- (A) The focus is on effectiveness.
 - (B) It requires motivation and leadership skills.
 - (C) It involves managing forces during action.
 - (D) It is primarily an operational process.
- (xv) Which one of the following activities involves receiving, storing and distributing inputs to the production process?
- (A) Inbound Logistics
 - (B) Operations
 - (C) Marketing & Sales
 - (D) Outbound Logistics

Section-B

Answer any Five questions from Question No. 2 to Question No. 8.

Each question carries 14 marks.

14×5=70

2. (a) "The Plant Layout selected in conformity with Layout Principles should be an ideal one"— **In this context, align** those Plant Layout Principles. 7
- (b) What is Design Thinking? **Briefly discuss** the five stages of Design Thinking. 7

3. (a) "Production Planning and Control fulfils its various objectives by focusing on the several important points/issues". **With reference to this statement, append** those said important points/issues.(Any Ten) 7

- (b) METRO-WALLS ICE CREAM PARLOUR observed that during summer months the daily sales of its ice cream depends on the average day temperature as shown in the following Table:

Average Day Temperature in Centigrade (X)	20	25	30	35	40
Daily Sale of Ice Cream (in Thousand ₹) (Y)	10	20	30	40	50

Required:

- (i) **Fit** a linear regression of Y on X.
- (ii) **Estimate** the trend values of daily sales of ice cream for average day temperature of 32 and 42 centigrade.
- (iii) **Estimate** the Average Day Temperature (in Centigrade) for the daily sale of ice cream of ₹ 60 thousands. 7
4. (a) A project of GREEN IP Ltd., consists of four major jobs, for which four contractors have submitted tenders. The tender amounts, in thousands of rupees, are given below:

Contractors	JOBS			
	A	B	C	D
1	39	70	37	50
2	20	27	47	63
3	25	37	58	49
4	43	48	46	50

(Each Contractor has to be assigned only one Job)

Required:

- (i) **Analyze** and assign the Jobs to appropriate Contractors so as to minimize the Total Cost of the Project. 7
- (ii) **Assess** the Total Costs of the Project.
- (b) **Home Town Interior Decoration Ltd.**, uses a costly drier while painting the fire protection doors. The drier is highly volatile. It cannot be stored. In order to meet the requirement of drier, the exact quantity is purchased every day and consumed. The Management of the Company wants to Simulate the demand of the drier. For this the

Management of the Company collected data for past 100 days for the application of the drier on the number of doors and the same data are shown in the table below:

Daily Demand (No. of Driers)	Number of Days
0	20
1	30
2	20
3	10
4	6
5	4
6	10

Consider the following Table of two Digit Random Numbers:

Random Numbers	03	23	36	93	69	43	87	51	11	08
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Required:

- (i) Using the following generated random numbers in Sequence, **generate** the demand of driers for next ten days.
- (ii) **Assess** the average demand of drier per day.

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5. (a) A computer of ROPAM Ltd., has 1000 nos. of Electronic Tubes.

They are subject to Mortality as given below:

Period	Age at Failure (Hrs.)	Probability of Failure
1	0 – 200	0.10
2	201 – 400	0.26
3	401 – 600	0.35
4	601 – 800	0.22
5	801 – 1000	0.07

If the tubes are group replaced, the cost of replacement is ₹ 150 per Electronic tube. Group replacement can be done at fixed intervals in the night shift when the computer is not normally used. Replacement of individual Electronic tubes which fail in Service Cost ₹ 600 per Electronic tube.

Assume that:

- (1) Electronic Tubes that fail during a period are replaced just before the end of the period.
- (2) The actual percentage of failure during a period for a sub-population of the Tubes with the same age is the same as the expected percentage of failure during the period for that sub-population.

Required:

- (i) **Analyze** the number of Electronic Tubes to be replaced every period.
- (ii) **Assess** the failure costs (₹) on average of individual replacement of electronic tubes.
- (iii) **Identify** at what interval of time the Company should replace all the electronic Tubes.
- (iv) **Advice** which policy of replacement will be economical to the Company. 7
- (b) BITZON Ltd., a Chemical Product Manufacturing Company have split their Schedule of Implementation into the following 6 activities and have estimated Time Duration (in weeks) under 3 Scenarios as under:

		(Time in Weeks)		
Activity and Identification		Optimistic time estimate	Pessimistic time estimate	Most likely time estimate
A	1 – 2	5	11	8
B	1 – 3	18	26	22
C	2 – 4	15	25	20
D	3 – 4	4	12	8
E	4 – 5	8	12	10
F	3 – 5	14	26	20

Required:

- (i) **Assess** the expected duration (in weeks) for each activity.
- (ii) **Design** the PERT Network Diagram and indicate all paths through it.
- (iii) **Identify** the Critical Path and its Duration (in weeks).
- (iv) **Analyze** and indicate the Total Float and Free Float available on each activity. 7
6. (a) “Objectives should possess certain desirable characteristics in order to be effective”. **In this context, identify** and explain those characteristics of Effective Objectives. 7
- (b) “Big data is a collection of data that is huge in volume and growing exponentially with time”. **In this Context Identify** the different types of big data and **briefly explain** the main characteristics of big data. 7

7. (a) **Identify** and analyze the five main steps involved in the Formal Strategic Planning Process. 7
- (b) "Business Environment exhibits many characteristics". **In this event, demonstrate** in brief the said important characteristics of Business Environment. 7
8. (a) "The Transnational Structure seeks to obtain the best form of the two extreme International Strategies, the Multi-Domestic Strategy and the Global Strategy". In this **context, identify** and discuss the characteristics of Transnational Structure. 7
- (b) "The achievement of goal congruence is essential in order to increase the profitability of the organization and to achieve its goals". **With reference to this statement, demonstrate** some of the areas that have the ability to create goal congruence. 7
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