INTERMEDIATE EXAMINATION

GROUP - II

(SYLLABUS 2016)

SUGGESTED ANSWERS TO QUESTIONS

DECEMBER - 2019

Paper - 9 : OPERATIONS MANAGEMENT & STRATEGIC MANAGEMENT

Time Allowed : 3 Hours **Full Marks : 100**

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

This paper contains two Sections.

Both Sections are compulsory, subject to instructions provided against each.

All workings must form part of your answer.

Assumptions, if any, must be clearly indicated.

Section – A

Operations Management

1. (a) Choose the correct answer: **1×10=10**

(i) Conversion of inputs into outputs is known as

(A) Application of technology

(B) Manufacturing products

(C) Product

(D) Operation management

(ii) Which of the following is NOT the Plant Layout Principle?

(A) Principle of sequence

(B) Principle of usage

(C) Principle of maximum travel

(D) Principle of minimum investment

(iii) Number of product varieties that can be manufactured in Mass production is

(A) one only.

(B) few varieties in large volume.

(C) two only.

(D) large varieties in small volumes.

(iv) Scheduling shows.

(A) which resource should do which job and when.

(B) total cost of production.

(C) total material cost.

(D) the flow line of materials.

(v) Which one of the following standards is associated with the "Quality Management and Quality System Elements-Guidelines"?

(A) ISO 9001

(B) ISO 9002

(C) ISO 9003

(D) ISO 9004

(vi) In a network diagram, the activity that must be completed prior to the start of an activity is called as

(A) Successor activity

(B) Predecessor activity

(C) Concurrent activity

(D) Dummy activity

(vii) Identify which one of the following is NOT the objective of the maintenance:

(A) To keep all production facilities and allied facilities in an optimum working condition.

(B) To ensure specified accuracy to products and time schedule of delivery to customers.

(C) To keep the down time of the machine at the maximum.

(D) To keep the production cycle within the stipulated range.

(viii) One of the important charts used in Programme control is

(A) Gantt chart

(B) Material chart

(C) Distribution chart

(D) Maintenance chart

(ix) The act of going round the production shop to note down the progress of work and feedback the information is known as

(A) Dispatching

(B) Routing

(C) Follow up

(D) Trip card

(x) With reference to the characteristics of a good product design, which one of the following is referred to "the ease of manufacture with minimum cost"?

(A) Reliability

(B) Productibility

(C) Specification

(D) Simplification

(b) Match Column A with Column B: 1x6=6

Column A	Column B
(A) Use of minimal amounts of resources to produce a high volume of high quality goods with some variety	(i) KAIZEN
(B) Arranging and grouping of machines which are meant to produce goods	(ii) Network
(C) The extent to which a firm will produce goods or provide services in-house or go for outsourcing	(iii) Monte Carlo Method
(D) A given problem is solved by simulating the original data with random number generators	(iv) Lean Production
(E) The principle of continuous improvement	(v) Make or Buy Decisions
(F) A graphical representation of all the activities and events arranged in a logical and sequential order	(vi) Layout

(c) State whether the following statements are 'True' or 'False': 1×6=6

(i) The full form of the word MRP in the term "MRP II" is Material Requirements Planning.

(ii) Strikes and lock-out are controllable factors affecting Capacity Planning.

(iii) Queue Discipline refers to the order in which customers are processed.

(iv) ISO Standards are reviewed every four years and revised if needed.

(v) The CPM has the advantage of decreasing completion times by probably spending more money.

(vi) The rotable spares are spare parts which are required regularly and in substantial number.

Answer:

1. (a)

(i) (D) Operation management

(ii) (C) Principle of maximum travel

(iii) (B) few varieties in large volume.

(iv) (A) which resource should do which job and when.

(v) (D) ISO 9004

(vi) (B) Predecessor activity

(vii) (C) To keep the down time of the machine at the maximum.

(viii) (A) Gantt chart

(ix) (C) Follow up

(x) (B) Productibility

1. (b)

(A) (iv) Lean Production

(B) (vi) Layout

(C) (v) Make or Buy Decisions

(D) (iii) Monte Carlo Method

(E) (i) KAIZEN

(F) (ii) Network

1. (c)

(i) False

(ii) False

(iii) True

(iv) False

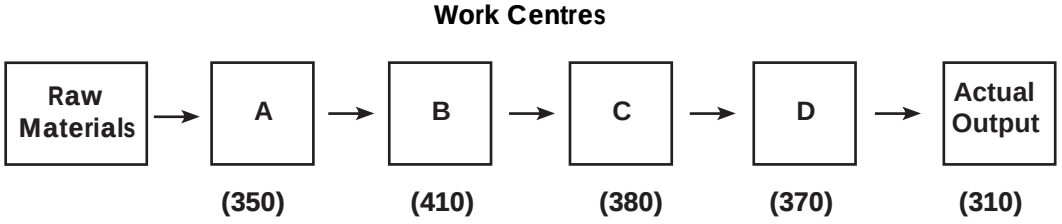
(v) True

(vi) False

Answer any three questions from the following: 16x3=48

2. (a) Enumerate the characteristics of a modern operations function. 7

(b) A firm has four work centres, A, B, C and D, in series with individual capacities in units per day shown in the figure below: 3×3=9



(i) Identify the bottle neck centre.

(ii) Determine the system capacity.

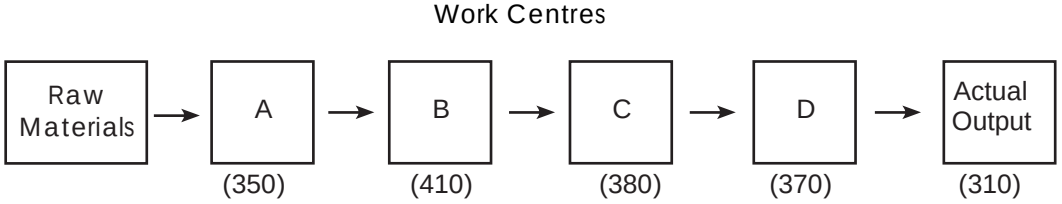
(iii) Determine the system efficiency.

Answer:

2. (a) Today's production system is characterised by the following features:

1. **Manufacturing as Competitive Advantage:** Unlike the past, today plants have excess capacities, competition is mounting and firms look and competitive edge and firms intend to exploit the potential. Total Quality Management (TQM), Time-Based Competition, Business Process Re-engineering (BPRE), Just-in-Time (JIT), Focused Factory, Flexible Manufacturing Systems (FMS), Computer Integrated Manufacturing (CIM), and The Virtual Corporation are but only some techniques which the companies are employing to gain competitive advantage.
2. **Services Orientation:** Service sector is gaining greater relevance these days. The production system, therefore, needs to be organised keeping in mind the peculiar requirements of the service component. The entire manufacturing needs to be geared to serve (i) intangible and perishable nature of the services, (ii) constant interaction with clients or customers, (iii) small volumes of production to serve local markets, and (iv) need to locate facilities to serve local markets. There is increased presence of professionals on the production, instead of technicians and engineers.
3. **Disappearance of Smokestacks:** Protective labour legislation, environmental movement and gradual emergence of knowledge based organisations have brought total transformation in the production system. Today's factories are aesthetically designed and built, environment friendly - in fact, they are homes away from homes. Going to factory every day is no more excruciating experience, it is like holidaying at a scenic spot.
4. **Small has Become Beautiful:** E. F. Schumacher, in his famous book Small is Beautiful, opposed giant organisations and increased specialisation. He advocated, instead, intermediate technology based on smaller working units, community ownership, and regional workplaces utilising local labour and resources. Businessmen, all over the world, did not believe in Schumacher's philosophy. Inspired by economies of scale, industrialists went in for huge organisations and mass production systems.

(b) A firm has four work centres.



(i) the bottle neck centre is the work centre having the minimum capacity. Hence, work centre 'A' is the bottleneck centre.

(ii) System capacity is the maximum units that are possible to produce in the system as a whole. Hence, system capacity is the capacity of the bottle neck centre i.e., 350 units.

(iii) System efficiency = Actual output/ System capacity = (310/350)×100 (i.e. maximum possible output) = 88.57%

3. (a) What do you understand by Process Design and Selection? **3+5=8**

(b) The following data is available for a manufacturing unit:

No. of operators	**16**
Daily working hours	**8**
No. of days per month	**25**
Standard production per month	**400 units**
Standard labour hours per units	**8**

The following information was obtained for June 2019:

Man days lost due to absenteeism	**36**
Units produced	**300**
Idle time	**260 man hours**

Find the following: **2×4=8**

(i) Per cent absenteeism

(ii) Efficiency of utilization of labour

(iii) Productive efficiency of labour

(iv) Overall productivity of labour in terms of units produced per man per month.

Answer:

3. (a)

Process Design is concerned with the overall sequences of operations required to achieve the product specifications. It specifies the type of work stations to be used, the machines and equipment necessary to carry out the operations. The sequence of operations is determined by (i) the nature of the product, (ii) the materials used, (iii) the quantities to be produced, and (iv) the existing physical layout of the plant.

The process design is concerned with the following:

(i) Characteristics of the product or service offered to the customers.

(ii) Expected volume of output.

(iii) Kinds of equipments and machines available in the firm.

(iv) Whether equipments and machines should be of special purpose or general purpose.

(v) Cost of equipments and machines needed.

(vi) Kind of labour skills available, amount of labour available and their wage rates.

(vii) Expenditure to be incurred for manufacturing processes.

(viii) Whether the process should be capital-intensive or labour-intensive.

(ix) Make or buy decision.

(x) Method of handling materials economically.

3. (b)

(i) Percent absenteeism = [(No. of Hrs. lost in absenteeism in a month)/(Total working hours per month)] x 100 = (36 x 8)/ (16 x 25 x 8) = 0.09 x 100 = 9%

(ii) Efficiency of utilization of labour = [(Standard labour hour to produce 300 units) / (Total labour hour)] x 100 = [(300 x 8) / (16 x 25 x 8)] x 100 =75%

(iii) Determination of Productive efficiency of labour:-

Standard time required to produce 300 units = 300 x 8 = 2400 labour hours. In June 2019, man hours lost = 36 x 8 = 288

In June 2019, Idle time (in hours) = 260 Total loss of time = 548 hrs.

Productive hours available in June 2019 = 16 x 25 x 8 = 3,200 hrs. Less, Total loss of time: 548 hrs.

Actual Labour hours = 3200 - 548 = 2,652 hrs

Productive efficiency of labour = [(Standard Labour hours) / (Actual labour hours)] x 100

= (2400/2652) x 100

= 90.497 %

= 90.50 % (approx.)

(iv) Overall productivity of labour in terms of units produced per man per month: 16 men produce 400 units, Standard labour productivity = 400/16 = 25 units In June 2019, overall productivity = 300/16 = 18.75 units

i.e. productivity falls by [(25-18.75)/25] x 100 = 25%

4. (a) Find the Initial Feasible Solution by North-West Corner method. **8**

	W1	W2	W3	W4	Supplies
F1	10	12	14	18	210
F2	25	19	21	30	330
F3	18	16	11	23	430
F4	28	34	17	15	290
Demand	270	390	320	280	

Wj = Warehouse

Fi = Factory

Cell entries are unit costs in ₹

(b) A retailer is dealing with FMCG items. The table, as given below, presents the past data of demand per week in hundred kgs with frequency.

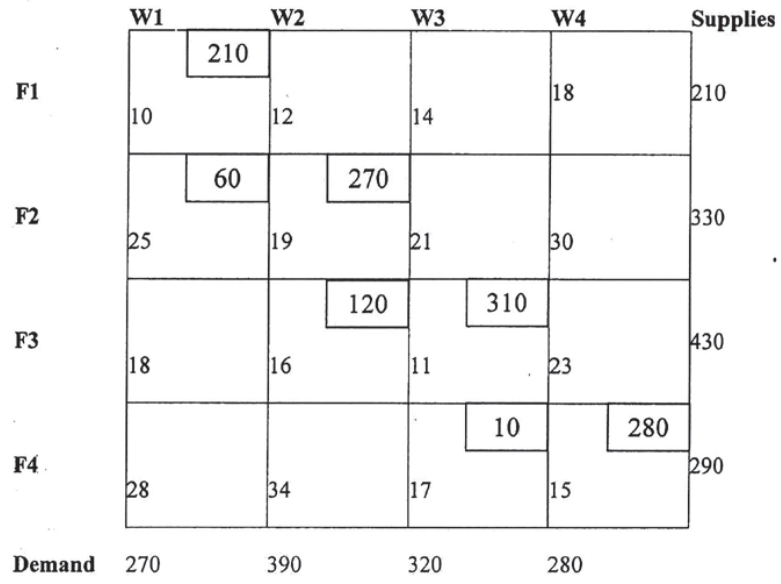
Demand/Week	0	5	10	15	20	25
Frequency	3	7	5	11	18	6

Using the following sequence of the random numbers, generate the demand for the next 10 weeks. Also find out the average demand per week. 6+2=8

Random Nos.	27	43	50	11	16	36
	58	64	51	38	18	47

Answer:

4. (a) The Initial Feasible Solution



Wj = Warehouse

Fi = Factory

Cell entries are unit costs in ₹

(b)

Random No. Range Table for Demand				
Demand per week	**Frequency (f)**	**Probability (p=f/∑f)**	**Cumulative Probability**	**Range of Random numbers**
0	3	0.06	0.06	0-5
5	7	0.14	0.20	6-19
10	5	0.10	0.30	20-29
15	11	0.22	0.52	30-51
20	18	0.36	0.88	52-87
25	6	0.12	1.00	88-99
	∑f=50	1.00		

Simulated Values for next 10 weeks		
Weeks	**Random nos.**	**Demand**
1	27	10
2	43	15
3	50	15
4	11	05
5	16	05
6	36	15
7	58	20
8	64	20
9	51	15
10	38	15
Total:	**-**	**135**

Average weekly demand is = 135/10=13.5

5. (a) Draw the network for the following activities and find the Critical Path and Total duration of the project. 6

Activity	Predecessor	Duration (months)
A	**-**	**2**
B	**-**	**3**
C	**-**	**5**
D	**A**	**4**
E	**B**	**1**
F	**B**	**5**
G	**C**	**8**
H	**D**	**1**
I	**E**	**2**
J	**F, G**	**4**
K	**H, I**	**3**
L	**K, J**	**2**

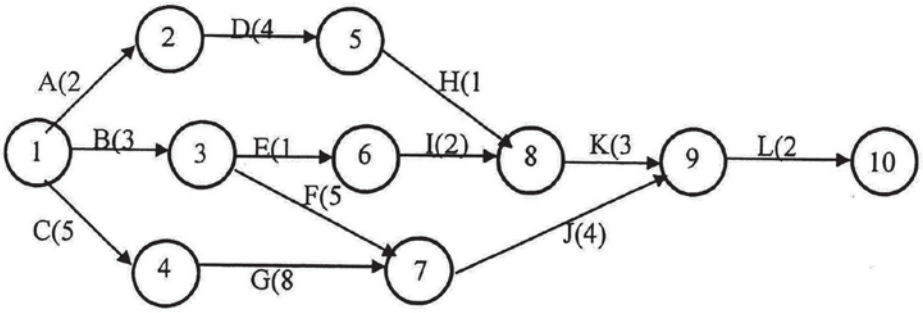
(b) RST Company has kept records of breakdown of its machines for 300 days work year as shown below:

No. of Breakdown	Frequency in days
0	50
1	140
2	60
3	30
4	20
Total	300

The company estimates that each breakdown costs ₹600 and is considering adopting a preventive maintenance program which would cost ₹ 250 per day and limit the number of breakdown to an average of one per day. What is the expected annual savings from preventive maintenance program? 10

Answer:

5. (a)



Calculation of Critical path:

(i) A-D-H-K-L = 2+4+1+3+2 = 12

(ii) B-E-I-K-L = 3+1+2+3+2 = 11

(iii) B-F-J-L = 3+5+4+2 = 14

(iv) C-G-J-L- = 5+8+4+2 = 19 = Critical Path (Project duration)

(b) Step-1:

No. of Breakdowns (X)	Frequency of breakdowns in days; i.e. f(x)	Probability distribution of break downs; i.e. p(x)	Expected value of breakdown X p(x)
0	50	50/300 = 0.167	Nil
1	140	140/300 = 0.466	0.466
2	60	60/300 = 0.200	0.400

3	30	30/300 = 0.100	0.300
4	20	20/300 = 0.067	0.268
Total:	300	1.000	1.434

Step - 2 :

Total no. of breakdowns per day = 1.434

Cost of breakdown per day = 1.434×600 = 860.4/-

Cost of preventive maintenance program per day = ₹ 250 + 600 = 850/- Expected annual savings from the preventive maintenance program = (860.4 – 850) × 300 = 10.4 × 300 = ₹ 3,120

Section - B

Strategic Management

6. Choose the correct answer: 1x6=6

(i) Which of the following statements can be closely related with the Mission?

(A) It includes definition of products & services the organization provides.

(B) It specifies management policies towards customers and societies.

(C) It provides a roadmap to company's future.

(D) It indicates the kind that company management is trying to create for future.

(ii) Portfolio Analysis is a term used

(A) to identify what strategy is needed to maintain a strong position or improve a weak one.

(B) to find out a best alternative out of various alternatives available.

(C) to analyse products and business by market share and market growth.

(D) to make managers more adaptable to unforeseen changes.

(iii) Which one of the following is NOT a role of Marketing?

(A) It helps in sustaining and improving the existing levels of employment.

(B) It helps in the economic growth of a country.

(C) It helps in the discovery of entrepreneurial talent.

(D) It diminishes potential aggregate demand and thus reduces the size of the market

(iv) Which one of the following in NOT the benefit of a Vision?

(A) It helps in the creation of common identity and a shared sense of purpose.

(B) It fosters risk taking and experimentation.

(C) It fosters short-term thinking.

(D) It represents integrity.

(v) The competitive position of a company's SBU or product line can NOT be classified as one of the following:

(A) Dominant

(B) Strong

(C) Favourable

(D) Volatile

(vi) The best test of a successful Strategy Implementation is

(A) whether the strategies and procedures are observed in the strategy supportive fashion.

(B) whether the structure is well-matched to strategy.

(C) whether actual organizational performance matches or exceeds the targets spelt out in the strategic plan.

(D) whether it is made after the strategy is formulated, so that it is supportive to the strategy.

Answer:

(i) (A) It includes definition of products & services the organization provides.

(ii) (A) to identify what strategy is needed to maintain a strong position or improve a weak one.

(iii) (D) It diminishes potential aggregate demand and thus reduces the size of the market.

(iv) (C) It fosters short-term thinking.

(v) (D) Volatile

(vi) (C) whether actual organizational performance matches or exceeds the targets spelt out in the strategic plan.

Answer any two questions from the following: 12x2=24

7. (a) Define the term 'strategy' and list the characteristics of a strategic decision. 2+6=8

(b) What do you understand by Product Development Strategy? 4

Answer:

7. (a)

Strategy may be defined as the direction and scope of a organisation over the long term, which achieves advantage for the organisation through the configuration of resources within a changing environment and to fulfill stakeholder expectations.

The definition of strategy encompasses a comprehensive master approach that states how the corporation will achieve its mission and objectives. It maximizes competitive advantage and minimizes competitive disadvantage.

The characteristics of a strategic decision/strategy:

(i) Strategy is likely to be concerned with long-term direction of an organisation.

(ii) Strategic decisions are normally about trying to achieve some advantage for the organisation over competition.

(iii) Strategy is likely to be concerned with the scope of the organisation's activities.

(iv) Strategy can be seen as matching the resources and activities to the environment in which it operates.

(v) Strategy can be seen as stretching an organisation's resources and competences to create new opportunities or to capitalise on them.

(vi) Strategies may require major resource changes for an organisation.

(vii) Strategic decisions are likely to affect operational decisions.

(viii) The strategy of an organisation is affected not only by environmental factors and resource availability but also by the values and expectations of those who have power in and around the organisation.

7. (b)

Product Development Strategy involves extending the product range available to the firm's existing markets. These products may be obtained by:

(i) investment in the research and development of additional products;

(ii) acquisition of rights to produce someone else's product;

(iii) buying-in the product and ₹badging' it;

(iv) joint development with owners of another product who need access to the firm's distribution channels or brands.

The critical factor to the success of this strategy is the profitability of the customer group for which the products are being developed. Also the firm's present competitive advantages in serving the market must confer on to the new good. These can include:

(i) customer information that allows accurate targeting;

(ii) established distribution channels;

(iii) a brand which can be credibly applied to the new product.

8. (a) What do you mean by Contingency Plans? Illustrate some contingency plans commonly established by firms. 1+5=6

(b) What are the three most important characteristics of SBU? List down major reasons of using SBU approach. 3+3=6

Answer:

8. (a) Contingency Plans:

Contingency plans can be defined as alternative plans that can be put into effect if certain key events do not occur as expected.

Some contingency plans commonly established by firms:

1. If a major competitor withdraws from particular markets as intelligence reports indicate, what actions should our firm take?
2. If our sales objectives are not reached, what actions should our firm take to avoid profit losses?
3. If demand for our new product exceeds plans, what actions should our firm take to meet the higher demand?

4. If certain disasters occur—such as loss of computer capabilities; a hostile takeover attempt; loss of patent protection; or destruction of manufacturing facilities because of earthquakes, tornadoes, or hurricanes — what actions should our firm take?
5. If a new technological advancement makes our new product obsolete sooner than expected, what actions should our firm take?

(b) Three most important characteristics of SBU:

- It is a single business or a collection of related businesses which offer scope for independent planning and which might feasibly stand-alone from the rest of the organisation.
- Has its own set of competitors.
- Has a manager who has responsibility for strategic planning and profit performance, and who has control of profit-influencing factors.

Major reasons of using SBU approach :

- A scientific method of grouping the businesses of a multi-business corporation which helps the firm in strategic planning.
- An improvement over the geographical grouping of businesses and strategic planning based on locational units.
- An SBU is a grouping of related businesses that can be taken up for strategic planning distinct from the rest of the businesses.
- Grouping the businesses on SBU lines helps the firm in strategic planning by removing the ambiguity and confusion generally seen in grouping businesses,
- Each SBU is a separate business from the strategic planning standpoint. In the basic factors, viz., mission, objectives, competition and strategy-one SBU will be distinct from another.
- Each SBU will have its own distinct set of competitors and its own distinct strategy.
- Each SBU will have a CEO. He will be responsible for strategic planning for the SBU and its profit performance; he will also have control over most of the factors affecting the profit of the SBU.

9. Write short notes on any three of the following: 4x3=12

(a) Name the steps involved in the formulation of production strategy.

(b) Write a brief note on 'Behaviour Control' aspect of Strategic Control System.

(c) What are the various types of firms/organizations where BPR can be applied?

(d) What are the various approaches in Strategic Planning?

Answer:

9. (a) Steps involved in the formulation of production strategy

(i) Study the overall corporate plan and define the objectives.

(ii) Analyse the present production operations and the present and future environment.

(iii) Review sales - forecast and marketing.

(iv) Make strategic decisions for production.

(b) 'Behaviour Control' aspect of Strategic Control System

The establishment of a comprehensive system of rules and procedures to direct the actions or behaviour of divisions, functions and individuals is called behaviour control. The main purpose of having behaviour control is not to specify goals but to standardise the way of reaching them. It is felt that if rules are standardised then outcomes are predictable. It is of utmost importance that the management reviews behaviour controls over time. The rules that have been established tend to increase over time leading to inflexibility to react to the changing environment thereby adversely affecting the organisation's competitive advantage.

(c) Types of firms/organizations where BPR can be applied

BPR could by implemented to all firms (manufacturing firms, retailers, services, etc.) and public organizations that satisfy the following criteria:

- Minimum Number of employees: 20 (at least 4 in management positions).
- Strong management commitment to new ways of working and innovation.
- Well formed IT infrastructure.

Business Process Reengineering could be applied to companies that confront problems such as the following:

- High operational costs
- Low quality offered to customers
- High level of "bottleneck" processes at pick seasons
- Poor performance of middle level managers
- Inappropriate distribution of resources and jobs in order to achieve performance, etc.

(d) Approaches in Strategic Planning

There are three approaches that can be adopted to strategic planning:

(i) A top-down process, in which managers are given targets to achieve which they pass on down the line.

(ii) A bottom-up process, in which functional and line managers in conjunction with their staff submit plans, targets and budgets for approval by higher authority.

(iii) An iterative process, which involves both the top-down and bottom-up setting of targets. There is a to-and-from movement between different levels until agreement is reached. However, this agreement will have to be consistent with the overall mission, objectives and priorities and will have to be made within the context of the financial resources available to the organization. The iterative approach, which involves the maximum number of people, is the one most likely to deliver worthwhile and acceptable strategic plans.