INTERMEDIATE EXAMINATION
GROUP - II
(SYLLABUS 2016)

SUGGESTED ANSWERS TO QUESTIONS

DECEMBER - 2017

Paper-9 : OPERATIONS MANAGEMENT AND STRATEGIC MANAGEMENT

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

This figures in the margin on the right side indicate full marks.
This paper contains 2 Sections.
Both Sections are compulsory, subject to instructions provided against each.
All working must form part of your answer.
Assumptions, if any, must be clearly indicated.

Section - A
(Operations Management)

1. (a) Choose the correct answer: 1x10=10

(i) The effective capacity is NOT influenced by which of the following factors:
- **(a) Forecasts of demand**
- **(b) Plant and labour efficiency**
- **(c) Subcontracting**
- **(d) None of the above**

(ii) Key aspects in process strategy does NOT include which of the following:
- **(a) Make or buy decisions**
- **(b) Capital intensity**
- **(c) Process flexibility**
- **(d) Packaging**

(iii) The example of worker involvement, as a recent trend in production/operations management is
- **(a) SCM**
- **(b) Just-in-Time**
- **(c) Quality Circle**
- **(d) MRP**

(iv) In an organization, the Production Planning and Control department comes under
- **(a) Planning department**
- **(b) Manufacturing department**
- **(c) Personnel department**
- **(d) R & D department**

(v) JIT stands for
- **(a) Just In Time Purchase**
- **(b) Just In Time Production**
- **(c) Just In Time use of Materials**
- **(d) Just In Time Order the Material**

(vi) In route sheet or operation layout, one has to show
- **(a) a list of materials to be used**
- **(b) a list of machine tools to be used**
- **(c) every work center and operation to be done at that work center**
- **(d) the cost of product**

(vii) One of the important charts used in Programme control is
- **(a) Material chart**
- **(b) Gantt chart**
- **(c) Route chart**
- **(d) Inspection chart**

(viii)Production planning in the intermediate range of time is termed as
- **(a) Production planning.**
- **(b) Long range production planning.**
- **(c) Scheduling.**
- **(d) Aggregate planning.**

(ix) Preventive maintenance is useful in reducing
- **(a) Inspection Cost**
- **(b) Cost of premature replacement**
- **(c) Shutdown Cost**
- **(d) Set-up Cost of machine**

(x) Which one of the following standards is associated with the "Quality Assurance in Production and Installation"?
- **(a) ISO 9001**
- **(b) ISO 9002**
- **(c) ISO 9003**
- **(d) ISO 9004**

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

Column A	Column B
(A) Fixture	(i) Conversion of Inputs into outputs
(B) Process layout	(ii) Network Analysis
(C) Capital Intensity	(iii) General purpose machines
(D) Operations Management	(iv)Mix of equipment and labour which will be used by the firm
(E) Crashing	(v) Appliance for holding the work
(F) Less prone to Obsolescence	(vi)Grouping together of similar machines in one department

(c) State whether the following statements are 'True' or 'False': 1x6=6
- **(i) Customer service is a key objective of operations management.**
- **(ii) In general short term forecasting will be more useful in production planning.**
- **(iii) If the total float value is zero, it means the resources are just sufficient to complete the activity without any delay.**
- **(iv) Job Evaluation is a systematic approach to ascertain the labour worth of a job.**
- **(v) Load control is typically found wherever a particular bottleneck machine does not exist in the process of manufacturing.**
- **(vi) The term "aesthetics" which appeals to the human sense does not add value to the product.**

Answer:

1. (a) (i) (d)
(ii) (d)
(iii) (c)
(iv) (b)
(v) (b)
(vi) (c)
(vii) (b)
(viii) (d)
(ix) (c)
(x) (b)

(b)

I		II
(A) Fixture	(v)	Appliance for holding the work
(B) Process layout	(vi)	Grouping together of similar machines in one department
(C) Capital Intensity	(iv)	Mix of equipment and labour which will be used by the firm
(D) Operations Management	(i)	Conversion of Inputs into outputs
(E) Crashing	(ii)	Network Analysis
(F) Less prone to Obsolescence	(iii)	General purpose machines

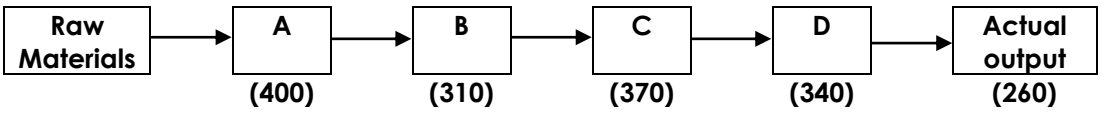
(c) (i) True
(ii) True
(iii) True
(iv) True
(v) False
(vi) False

2. Answer any three questions from the following: 16×3=48

(a) Briefly explain the characteristics of the modern production system. 7

(b) A firm has four work centres, A, B, C & D, in series with individual capacities in units per day shown in the figure below.

Work Centres



(i) Identify the bottle neck centre.
(ii) What is the system capacity?
(iii) What is the system efficiency? 9

Answer:

2. (a) 'The production management of today presents certain characteristics which make it look totally different from what it was during the past as follows:

1. **Manufacturing as Competitive Advantage:** In the past production was considered to be like any other function in the organisation. When the demand was high and production capacities were inadequate, the concern was to somehow muster all inputs and use them to produce goods which would be grabbed by market. But today's scenario is contrasting. Plants have excess capacities, competition is mounting and firms look and gain competitive advantage to survive and succeed. Production system offers vast scope to gain 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 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:** It was E.F. Schumacher who, 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. For him, small was beautiful. 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) (i) The bottle neck centre is the work centre having the minimum capacity. Hence, work centre 'B' 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., 310 units.

(iii) System efficiency = Actual output/ System capacity
= (260/310) x 100 (i.e., maximum possible output)
= 83.87%

3. (a) Discuss about the following process types to be implemented by a Production Manager as a strategy: 3+4=7
(i) Batch Process,
(ii) Repetitive Process.

(b) Workers come to a tool store room to enquire about special tools (required by them) for accomplishing a particular project assigned to them. The average time between the two arrivals is 60 seconds and the arrivals are assumed to be in Poisson distribution. The average service time (of the tool room attendant) is 48 seconds.

Determine: 3x3=9
(i) Average Queue Length
(ii) Average Length of non-empty queues
(iii) Average number of workers in system including the worker being attended

Answer:

3. (a) **(i) Batch process:** Batch processing is used when a moderate volume of goods or services is required and also a moderate variety in products or services. A batch process differs from the job process with respect to volume and variety. In batch processing, volumes are higher because same or similar products or services are repeatedly provided, examples of products produced in batches include paint, ice cream, soft drinks, books and magazines.

(ii) Repetitive process: This is used when higher volumes of more standardised goods or services are needed. This type of process is characterised by slight flexibility of equipment (as products are standardised) and generally low labour skills. Products produced include automobiles, home appliances, television sets, computers, toys etc. Repetitive process is also referred to as line process as it includes production lines and assembly lines in mass production. Resources are organised around a product or service and materials move in a line flow from

one operation to the next according to a fixed sequence with little work-in-progress inventory. This kind of process is suitable to "manufacture-to-stock" strategy with standard products held in finished goods inventory. However, "assemble-to-order" strategy and "mass customisation" are also possible in repetitive process.

(b) Arrival Rate: λ = 60/60 per second = 1 per minute
Service Rate: μ = 60/48 per second= 1.25 per minute

(i) Average Queue Length: $L_q = (\lambda/\mu)\times[\lambda/(\mu - \lambda)]$ = (1/1.25)x[(1/(1.25 - 1)]
=1/(1.25x0.25) = 16/5
= 3.2 workers

(ii) Average Length of non-empty queues:
$L_n = [\mu/(\mu - \lambda)]$ = 1.25/(1.25-1) = 1.25/0.25 = 5 workers

(iii) Average number of workers in system:
$L_s = [\lambda/(\mu - \lambda)]$ = 1/(1.25-1) = 1/0.25 = 4 workers

4. (a) The below Table shows the time remaining (number of days until due date) and the work remaining (number of days' work) for 5 jobs which were assigned the Letters A to E as they arrived to the shop. Sequence these jobs by priority rules viz., 2x5=10 (i) FCFS (ii) EDD (iii) LS (iv) SPT (v) LPT.

Job	Number of days until due date	Number of days' work remaining
A	**9**	**5**
B	**4**	**7**
C	**5**	**3**
D	**6**	**6**
E	**8**	**2**

(b) A department works on 8 hours shift, 285 days a year and has the usage data of a machine, as given below:

Product	Annual Demand (units)	Processing time (Standard time in hours)
A	**360**	**7-0**
B	**435**	**5-0**
C	**570**	**60**

Calculate:
(i) Processing time needed in hours to produce products A, B and C,
(ii) Annual production capacity of one machine in standard hours, and
(iii) Number of machines required. 2×3=6

Answer:

4. (a) Numerical: The below Table shows the time remaining

Job	Number of days until due date	Number of days work remaining
A	9	5
B	4	7
C	5	3
D	6	6
E	8	2

(i) FCFS (First come first served): Since the jobs are assigned letters A to E as they arrived to the shop, the sequence according to FCFS priority rule is ABCDE.

(ii) EDD (Early Due Date job first) rule: Taking into account the number of days until due date, the sequence of jobs as per EDD rules is B C D E A (4 5 6 8 9).

(iii) L.S. (Least slack) rule also called as Minimum slack rule.
Calculation of slack:
Slack = (Number of days until due date) - (Number of days work remaining)

Job	Slack	(Days)
A	9-5	=4
B	4-7	=(-3)
C	5-3	=2
D	6-6	= 0
E	8-2	=6

Sequence = B D C A E
(-3 0 2 4 6)

(iv) SPT (Shortest Processing Time job first) also referred as SOT (Shortest Operation time job First) rule or MINPRT (Minimum Processing time job first) rule.
Sequence: E C A D B
(2 3 5 6 7)

(v) LPT (Longest Processing time job first) also referred to as LOT (Longest operation time job first) rule.
Sequence: B D A C E
(7 6 5 3 2)

(b) (i) The processing time needed in hours to produce products A, B and C in the quantities demanded visiting the standard time data;

Product	Annual Demand (units)	Processing time (Standard time in hours)	Processing time needed (hours)
A	360	7.0	360 x 7 = 2,520
B	435	5.0	435 x 5 = 2,175
C	570	6.0	570 x 6 = 3,420
			Total = 8,115 hrs.

(ii) Annual production capacity of one machine in standard hours = 8 x 285 = 2,280 hours/year

(iii) Number of machines required = Work load per year/Production capacity per machine = 8,115/2,280 = 3.5592 machines = 4 Machines

5. (a) A Public Transport Company is experiencing the following number of breakdowns for months over the past 2 years in their new fleet of vehicles:

Number of breakdowns	**0**	**1**	**2**	**3**	**4**
Number of months this occurred	**3**	**6**	**9**	**4**	**2**

Each breakdown costs the company an average of ₹ 2,500. For a cost of ₹ 1,700 per month, preventive maintenance can be carried out to limit the breakdowns to an average of one per month. Which policy is suitable for the company? 10

(b) Draw the network for the following activities and find critical path and total duration of the project. 2+2+2=6

Activity	**Duration (months)**
1-2	**2**
2-3	**3**
2-4	**1**
3-4	**2**
4-5	**3**
5-6	**2**
5-7	**4**
6-8	**1**
7-8	**3**
8-9	**4**

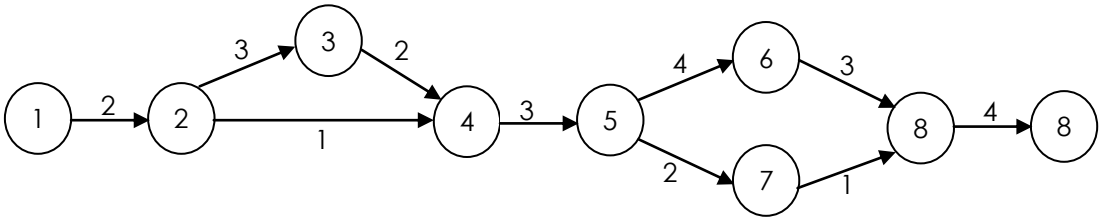
Answer:

5. (a) After converting the frequencies to a probability distribution and determining the expected cost/month of breakdowns, we get:

Number of breakdowns	Frequency in months	Frequency in percent	Expected value
0	3	3/24 = 0.125	0
1	6	6/24 = 0.25	0.25
2	9	9/24 = 0.375	0.75
3	4	4/24 = 0.167	0.5
4	2	2/24 = 0.083	0.334
		Total : 1	Total: 1.834

Breakdown cost per month; Expected cost = 1.834 x ₹ 2500 = ₹ 4,585.
Preventive maintenance cost per month: -
Average cost of one breakdown/month = ₹ 2,500
Maintenance contract cost/month = ₹ 1,700
Total = ₹ 4,200.
Thus, preventive maintenance policy is suitable for the firm.

(b) Network diagram:



Paths	Duration (months)
1-2-3-4-5-7-8-9	2+3+2+3+4+3+4=21 (Critical path)
1-2-3-4-5-6-8-9	2+3+2+3+2+1+4=17
1-2-4-5-7-8-9	2+1+3+4+3+4=17
1-2-4-5-6-8-9	2+1+3+2+1+4=13

Section - B
(Strategic Management)

6. Choose the correct answer: **1×6=6**

(i) Board of directors has certain basic tasks as follows:
- **(a) To monitor plans and programs of production.**
- **(b) To design the course of strategic options and appointment of top management.**
- **(c) To control utilization of resources.**
- **(d) To monitor courses of actions for marketing management.**

(ii) A Strategic Business Unit (SBU) is defined as a division of an organization:
- **(a) That helps in the marketing operation.**
- **(b) That helps in the choice of technology.**
- **(c) That enables managers to have better control over the resources.**
- **(d) That helps in identifying talents and potentials of people.**

(iii) Mckinsey's 7-s framework consists of:
- **(a) Structure, Strategy, Software, Skills, Styles, Staff and Supervision**
- **(b) Structure, Strategy, Systems, Skills, Styles, Syndication and Shared values**
- **(c) Structure, Strategy, Systems, Skills, Steering power, Styles and Shared values**
- **(d) Structure, Strategy, Staff, Skills, Systems, Shared values, Style**
- **(e) None of the above**

(iv) What are enduring statements of purpose that distinguish one business from other similar Firms?
- **(a) Policies**
- **(b) Mission statements**
- **(c) Objectives**
- **(d) Rules**
- **(e) Nature of ownership**

(v) Outsourcing is the
- **(a) spinning off of a value-creating activity to create a new firm.**
- **(b) selling of a value-creating activity to other firms.**
- **(c) purchase of a value-creating activity from an external supplier.**
- **(d) use of computers to obtain value-creating data from the Internet.**

(vi) For an actress in Bollywood, her pretty face would be a/an
- **(a) Asset**
- **(b) Strategic asset**
- **(c) Core competency**
- **(d) Capability**
- **(e) All of the above**

Answer:

6. (i) (b)
(ii) (c)
(iii) (d)
(iv) (b)
(v) (c)
(vi) (b)

Answer any two questions from the following: 12×2=24

7. (a) Explain, in one or two statements, a Company mission. State any three major objectives. 3+3=6

(b) Define the term 'Portfolio Analysis'. List the factors influencing Portfolio Strategy. 2+4=6

Answer:

7. (a) A Company mission

The mission is a broadly framed but enduring statement of company intent. It embodies the business philosophy of strategic decision makers; implies the image the company seeks to project; reflects the firm's self-concept; indicates the principal product or service areas and primary customer needs the company will attempt to satisfy. In short, the mission describes the product, market, and technological areas of emphasis for the business in a way that reflects the values and priorities of the strategic decision makers.

Objectives:

1. To ensure unanimity of purpose within the organisation.
2. To provide a basis for motivating the use of the organisation's resources.
3. To develop a basis, or standard, for allocating organisational resources.
4. To establish a general tone or organisational climate, for example, to suggest a businesslike operation.
5. To serve as a focal point for those who can identify with the organisation's purpose and direction, and to deter those who cannot from participating further in the organisation's activities.
6. To facilitate the translation of objectives and goals into a work structure involving the assignment of tasks to responsible elements within the organisation.
7. To specify organisational purposes and the translation of these purposes into goals in such a way that cost, time, and performance parameters can be assessed and controlled.

(b) Portfolio analysis is a term used in describing methods of analysing a product -market portfolio with the following aims.

(i) To identify the current strengths and weaknesses of an organisation's products in its markets, and the state of growth or decline in each of these markets.

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

Factors influencing Portfolio Strategy:

1) Mission/Vision.
2) Value system.
3) Future of Current Business.
4) Position on the Portfolio Matrix/PLC.
5) Government Policy.
6) Competitive Environment.
7) Company Resources.
8) Supply/Demand Conditions.
9) Competitive Moves.
10) Portfolio Strategy of Parent.
11) Business Environment.

8. **(a) Explain the terms: (i) Marketing Plan and (ii) Social Marketing. 3+3=6**

(b) What is meant by a contingency plan? List its benefits. 2+4=6

Answer:

8. (a) (i) Marketing Plan: Marketing plan is a written document that specifies in detail the firms marketing objectives and how marketing management will use the controllable marketing tools such as product design, channels, promotion and pricing to achieve these objectives.
Marketing strategy means finding attractive opportunities and developing profitable ways to capture the market.
A marketing strategy specifies a target market and a related marketing mix. It is a big picture of what a firm will do in some market. The job of planning strategies to guide a whole company is called strategic planning. It is the managerial process of developing and maintaining a match between an organisation's resources and its market opportunities.

(ii) Social Marketing: Societal marketing concept calls for a customer orientation backed by integrated marketing aimed at generating customer satisfaction and long-run consumer welfare as the key to attaining long-run profitable volume.

(b) Contingency Plan: A basic premise of good strategic management is that firms plan ways to deal with unfavorable and favorable events before they occur. Too many organizations prepare contingency plans just for unfavorable events; this is a mistake, because both minimizing threats and capitalizing on opportunities can improve a firm's competitive position.

Regardless of how carefully strategies are formulated, implemented, and evaluated, unforeseen events, such as strikes, boycotts, natural disasters, arrival of foreign competitors, and government actions, can make a strategy obsolete. To minimize the impact of potential threats, organizations should develop contingency plans as part of their strategy-evaluation process. Contingency plans can be defined as alternative plans that can be put into effect if certain key events do not occur as expected. Only high-priority areas require the insurance of contingency plans. Strategists cannot and should not try to cover all bases by planning for all possible contingencies. But in any case, contingency plans should be as simple as possible.

Benefits of Contingency Planning:

(i) It will make the future through their proactive planning and advanced preparation.

(ii) It will introduce original action by removing present difficulties.
(iii) It enables to anticipate future problems.
(iv) It will change the goals to suit internal and external changes.
(v) It experiments with creative ideas and take initiative.
(vi) It will attempt to shape the future and create a more desirable environment.
(vii) It permits quick response to change,
(viii) It prevents panic in crisis situations.
(ix) It makes managers more adaptable to unforeseen changes.

9. Write short notes on any three of the following: 4×3=12
(a) Unrelated Diversification
(b) Hybrid Organization
(c) Strategy
(d) Time Frame of Objectives

Answer:

9. (a) Unrelated Diversification
Unrelated Diversification is also termed conglomerate growth because the resulting corporation is a conglomerate, i.e. a collection of businesses without any relationship to one another. The strategic justifications advanced for this strategy are to:
- take advantage of poorly managed companies which can then be turned around and either run at a gain to the shareholders or sold-on at a profit;
- spread the risks of the firm across a wide range of industries;
- escape a mature or declining industry by using the positive cash flows from it to develop into new and more profitable areas of business.

(b) Hybrid Organization
A single type of structural design is not always sufficient to meet the requirements of strategy. When this occurs, one opinion is to mix and blend the basic organizations forms, matching structure to strategy, requirement by requirement, and unit by unit. Hybrid structure is a form of departmentalization that adopts parts of both functional and divisional structures at the same level of management. The major potential advantage of the hybrid structures is that the combination may allow the firm to gain the advantages offered by the primary structure while at least diminishing the impact of the disadvantages.

(c) Strategy
Strategy is all about integrating organizational activities and utilizing and allocating the scarce resources within the organizational environment so as to meet the present objectives. While planning a strategy it is essential to consider that decisions are not taken in a vacuum and that any act taken by a firm is likely to be met by a reaction from those affected, competitors, customers, employees or suppliers. Strategy can also be defined as knowledge of the goals, the uncertainty of events and the need to take into consideration the likely or actual behaviour of others. Strategy is the outline of decisions in an organization that shows its objectives and goals, reduces the key policies, and plans for achieving these goals, and defines the business the company is to carry on, the type of economic and human organization it wants to be, and the contribution it plans to make to its shareholders, customers and society at large.

(d) Time Frame of Objectives
Objectives are timeless, enduring, and unending; goals are temporal, time-phased, and intended to be superseded by subsequent goals. Because objectives relate to' the ongoing activities of an organisation, their achievement tends to be open-ended in the sense of not being bounded by time. For example, the survival objective of a business organisation is never completely attained since failure is always a future possibility.