INTERMEDIATE EXAMINATION

GROUP II

(SYLLABUS 2016)

SUGGESTED ANSWERS TO QUESTIONS

DECEMBER 2018

Paper- 9: OPERATION MANAGEMENT AND 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) Which one of the following recent trends in Production/Operations management involves drastic measures or break through improvements to improve the performance of a firm?

(A) Corporate Downsizing

(B) Re-Engineering

(C) Technology

(D) TQM

(ii) The starting point of Production cycle is

(A) Product design

(B) Production planning

(C) Routing

(D) Market research

(iii) Which of the following process types is used when a very highly standardized product is desired in high volumes?

(A) Repetitive Process

(B) Batch Process

(C) Project Process

(D) Continuous Process

(iv) Which of the following aims at finding the best and most efficient way of using the available resources—men, materials, money and machinery?

(A) Method Study

(B) Work Study

(C) Time Study

(D) Motion Study

(v) Generally the size of the order for production in Job production is

(A) small

(B) large

(C) medium

(D) very large

(vi) Which one of the following statements is NOT correct?

(A) LFT is calculated from the LFT of the head event.

(B) Slack can be calculated by adding EFT and LFT of any job.

(C) EFT is the sum of the EST and the time of duration for any event.

(D) The Total Project time is the shortest possible time required in completing the project.

(vii) Which one of the following is NOT the advantage of Preventive Maintenance?

(A) Better product quality

(B) Greater safety to workers

(C) Increased breakdowns and downtime

(D) Fewer large-scale repairs

(viii) Which one of the following establishes time sequence of operations?

(A) Routing

(B) Sequencing

(C) Scheduling

(D) Dispatching

(ix) MRP stands for

(A) Material Requirement Planning

(B) Material Reordering Planning

(C) Material Requisition Procedure

(D) Material Recording Procedure

(x) With reference to Aggregate Planning, identify which of the following statements is NOT correct?

(A) It is an Intermediate-term planning.

(B) It is made operational through a master schedule, that gives the manufacturing schedule.

(C) Facility planning and scheduling are closely related with the aggregate planning.

(D) It deals with the strategic decisions, such as purchase of facilities, introduction of new products, processes, etc.

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

Column A	Column B
(A) Any place in a production process where materials tend to pile up or produced at rates of speed less rapid than the previous or subsequent operations	(i) Assignment
(B) It is used when a low volume of high variety goods are needed	(ii) Globalisation
(C) A special Linear Programming Problem	(iii) Bottleneck
(D) Steep increase in the level of competition among manufacturing firms throughout the world	(iv) Maintenance Request
(E) Systematic Quantitative structural approach to the problem of managing a project through to successful completion	(v) Job-Shop Process
(F) This must be made in writing to a central point in the organization	(vi) Network Analysis

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

(i) Short-term forecasting is useful to serve the purpose of estimating the inventory requirement.

(ii) The life cycle of a product has many points of similarity with the human life cycle.

(iii) The Linear Programming problem has two basic parts: the objective function and the constraint set.

(iv) The most widely used index of productivity is to work out the output per machine-hour.

(v) PERT is designed for repetitive projects, whereas CPM is suitable for non-repetitive projects.

(vi) Wear and obsolescence are two main causes for replacement of machinery in every aspect of life.

Answer: 1(a)

(i) - (B) Re-engineering

(ii) - (D) Market Research

(iii) - (D) Continuous Process

(iv) - (B) Work Study

(v) - (A) Small

(vi) - (B) Slack can be calculated by adding EFT and LFT of any job.

(vii) - (C) Increased breakdowns and downtime

(viii) -(C) Scheduling

(ix) - (A) Material Requirement Planning

(x) – (D) It deals with the strategic decisions, such as purchase of facilities, introduction of new products, processes, etc.

Answer: 1(b)

Column A	Column B
(A) Any place in a production process where materials tend to pile up or produced at rates of speed less rapid than the previous or subsequent operations	(iii) Bottleneck
(B) It is used when a low volume of high variety goods are needed	(v) Job-Shop Process
(C) A special Linear Programming Problem	(i) Assignment
(D) Steep increase in the level of competition among manufacturing firms throughout the world	(ii) Globalisation
(E) Systematic Quantitative structural approach to the problem of managing a project through to successful completion	(vi) Network Analysis
(F) This must be made in writing to a central point in the organization	(iv) Maintenance Request

Answer: 1(c)

(i) True

(ii) True

(iii) True

(iv) False

(v) False

(vi) True

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

2. (a) Explain the concept of Operating System in order to have a clear idea of Operations Management.

(b) With the help of following data, project the trend of sales for the next 5 years: 6+10=16

Years	2002	2003	2004	2005	2006	2007
Sales in Lakhs of Rupees	120	130	135	140	150	165

Answer: 2(a)

In order to have a clear idea of Operations Management, one must have an idea of 'Operating Systems'.

An Operating System is defined as a configuration of resources combined for the provision of goods or services.

Retail organizations, hospitals, bus and taxi services, tailors, hotels and dentists are all examples of operating systems. Any operating system converts inputs, using physical resources, to create outputs, the function of which is to satisfy customers wants. The creation of goods or services involves transforming or converting inputs into outputs. Various inputs such as capital, labour, and information are used to create goods or services using one or more transformation processes (e.g., storing, transporting, and cutting). To ensure that the desired output are obtained, an organization takes measurements at various points in the transformation process (feedback) and then compares with them with previously established standards to determine whether corrective action is needed (control).

It is important to note that goods and services often occur jointly. For example, having the oil changed in your car is a service, but the oil that is delivered is a good. Similarly, house painting is a service, but the paint is a good.

The goods-service combination is a continuum. It can range from primarily goods, with little service, to primarily service, with few goods. Because there are relatively few pure goods or pure services, companies usually sell product packages, which are a combination of goods and services. There are elements of both goods production and service delivery in these product packages. This makes managing operations more interesting, and also more challenging.

Answer: 2(b)

Computation of trend values of sales:

Year	Time deviations from the middle of 2004 and 2005 assuring 5 years = 1	Sales (in lakhs of Rs.)	Squares of time deviation	Product of time deviation and sales
	X	Y	X^2	XY
2002	-5	120	25	-600
2003	-3	130	9	-390
2004	-1	135	1	-135
2005	+1	140	1	+140
2006	+3	150	9	+450
2007	+5	165	25	+825
n=6	$\sum x = 0$	$\sum x = 840$	$\sum x^2 = 70$	$\sum XY = 290$

Regression equation of Y on X:

$\sum Y = a + bX$

To find the values of a and b:

$a = \sum Y/n = 840/6 = 140$

$b = \sum XY/\sum X^2$

$= 290/70 = 4.143$ approx.

Sales forecast for the next five years, i.e., 2008 to 2012:

$Y_{2008} = 140 + [29/7 \times (+7)] = 169$ lacs

$Y_{2009} = 140 + [29/7 \times (+9)] = 177.28$ lacs

$Y_{2010} = 140 + [29/7 \times (+11)] = 185.57$ lacs

$Y_{2011} = 140 + [29/7 \times (+13)] = 193.85$ lacs

$Y_{2012} = 140 + [29/7 \times (+15)] = 202.14$ lacs

3. (a) What are the various activities and responsibilities of product design?

(b) Describe the objectives of Production Planning and Control. 6+10=16

Answer: 3(a)

Various activities & responsibilities of Product design:

(i) Translating customer needs and wants into product and service requirements (marketing).

(ii) Refining existing products (marketing).

(iii) Developing new products (marketing, product design and production).

(iv) Formulating quality goals (quality assurance, production).

(v) Formulating cost targets (accounting).

(vi) Constructing and testing prototype (marketing, production).

(vii) Documenting specifications (product design).

Answer: 3(b)

Objectives of Production Planning and Control:

(i) Analysing the orders to determine the raw materials and parts that will be required for their completion,

(ii) Answering questions from customers and salesmen concerning the status of their orders,

(iii) Assisting the costing department in making cost estimates of orders,

(iv) Assisting the human resource departments in the manpower planning and assignment of men to particular jobs,

(v) Controlling the stock of finished parts and products,

(vi) Determining the necessary tools required for manufacturing,

(vii) Direction and control of the movement of materials through production process,

(viii) Initiating changes in orders as requested by customers while orders are in process,

(ix) Issuing requisitions for the purchase of necessary materials,

(x) Issuing requisitions for the purchase or manufacture of necessary tools and parts,

(xi) Keeping the up-to-date records scheduled and in process,

(xii) Maintaining stocks of materials and parts,

(xiii) Notifying sales and accounting of the acceptance of orders in terms of production feasibility,

(xiv) Preparing the route sheets and schedules showing the sequence of operation required to produce particular products,

(xv) Production of work orders to initiate production activities,

(xvi) Receiving and evaluating reports of progress on particular orders and initiating corrective action, if necessary,

(xvii) Receiving orders from customers,

(xviii) Revising plans when production activities cannot conform to original plans and when revisions in scheduled production are necessary because of rush orders.

4. (a) Find initial Feasible Solution by North-West Corner method.

	W1	W2	W3	W4	SUPPLIES
F1	47	59	55	57	150
F2	44	54	52	59	270
F3	49	64	59	61	370
F4	51	63	54	60	230
DEMAND	210	330	260	220	

W_j → Warehouse

F_j → Factory, and

Cell entries are unit costs.

(b) A departmental store is running a snack items selling outlet. Past data of snack items' demand per week in hundred kgs with frequency is given below:

Demand/Week	0	6	12	18	24	30
Frequency	3	10	9	20	6	2

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

Random Numbers	21	34	48	97	72	31	45	56
	47	37	82	44	67	75	63	

6+(8+2)=16

Answer: 4(a)

Initial Feasible Solution by North- West Corner method.

	W1	W2	W3	W4	SUPPLIES
F1	150 47	59	55	57	150
F2	60 44	210 54	52	59	270
F3	49	120 64	250 59	61	370
F4	51	63	10 54	220 60	230
DEMAND	210	330	260	220	

Answer: 4(b)

Random No. Range Table for demand

Demand per week	Frequency	Probability	Cumulative Probability	Range
0	3	0.06	0.06	0-5
6	10	0.20	0.26	6-25
12	9	0.18	0.44	26-43
18	20	0.40	0.84	44-83
24	6	0.12	0.96	84-95
30	2	0.04	1.00	96-99
	∑f= 50	1.00		

Simulated value for next 10 weeks

Weeks	R. Nos.	Demand
1	21	6
2	34	12
3	48	18
4	97	30
5	72	18
6	31	12
7	45	18
8	56	18
9	47	18
10	37	12
	TOTAL	162

Average Weekly Demand: 162/10= 16.2

5. (a) Draw the network for the following activities and find the critical path and total duration of the project.

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

(b) An automotive firm is using a machine whose purchase price is Rs. 18,000.

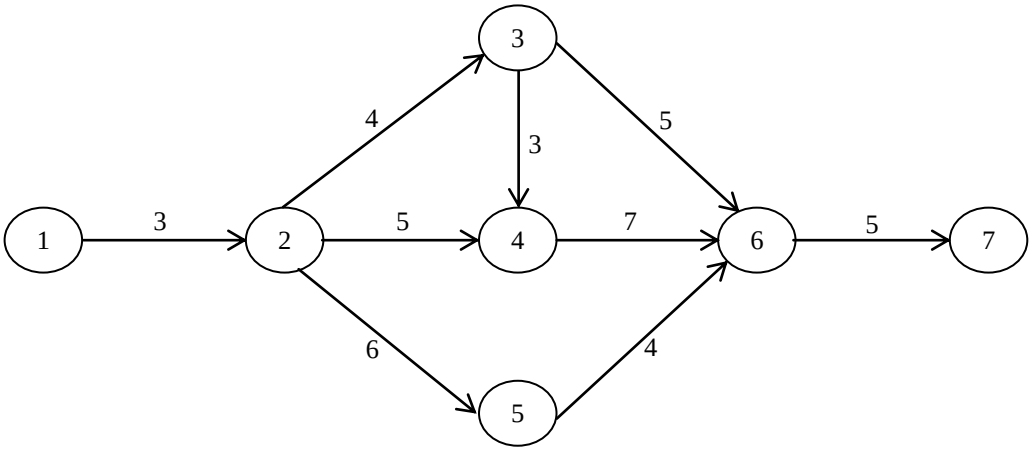
The Installation charges amount to Rs.3,800 and the machine has a scrap value of only Rs.1,800 because the firm has a monopoly of this type of work. The maintenance cost in various years is given in the following table:

Year	1	2	3	4	5	6	7	8	9
Maintenance cost (Rs.)	250	720	1200	1700	2300	3200	4300	4800	6300

The firm wants to determine after how many years should the machine be replaced on economic considerations, assuming that the machine replacement can be done only at the year end. (2×3)+10 = 16

Answer: 5(a)

Network diagram:



Paths and their durations: -

1-2-3-6-7 → 3+4+5+5 =17 months

1-2-3-4-6-7 → 3+4+3+7+5 = 22 months → Critical Path

1-2-4-6-7 → 3+5+7+5 =20 months

I-2-5-6-7 → 3+6+4+5 =18 months

Answer: 5(b)

An automotive firm is using a machine...

Cost of machine, C = Rs. 18,000 + 3,800 = 21,800
Scrap Value, S = Rs. 1,800

Year	Maintenance Cost, M_j (Rs.)	Cumulative Maintenance Cost, $\sum M_j$ (Rs.)	C - S (Rs.)	Total Cost $T_{(n)}$ (Rs.)	Annual Cost $A_{(n)}$ (Rs.)
(i)	(ii)	(iii)	(iv)	(v)=(iii)+(iv)	(vi)=(v)/n
1	250	250	21,800 -1,800 = 20,000	20,250	20,250
2	720	970	20,000	20,970	10,485
3	1,200	2,170	20,000	22,170	7,390
4	1,700	3,870	20,000	23,870	5,967.5
5	2,300	6,170	20,000	26,170	5,234
6	3,200	9,370	20,000	29,370	4,895
7	4,300	13,670	20,000	33,670	4,810
8	4,800	18,470	20,000	38,470	4,808.8
9	6,300	24,770	20,000	44,770	4,974.4

Lowest average cost is Rs. 4808.8 approx., which corresponds to n = 8 in above table. Thus machine needs to be replaced every 8th year.

SECTION – B

Strategic Management

6. Choose the correct answer: 1×6=6

(i) A corporate strategy can be defined as

(A) A list of actions about operational planning and statement of organisation structure and control system.

(B) A statement of how to compete, direction of growth and method of assessing environment.

(C) Abatement of organisation's activities and allocation of resources.

(D) A course of action or choice of alternatives, specifying the resources required to achieve certain stated objectives.

(ii) The existence of price-wars in the airline industry in India indicates that

(A) customers are relatively weak because of the high switching costs created by frequent flyer programmes.

(B) the industry is moving towards differentiation of services.

(C) the competitive rivalry in the industry is severe.

(D) the economic segment of the external environment has shifted, but the airline strategies have not changed.

(iii) Business Process Re-engineering is

(A) eliminating loss-making process.

(B) redesigning operational processes.

(C) redesigning the product and services.

(D) recruiting the process engineers.

(iv) Which one or more of the following are appropriate as a judicious mix for a Product line, which is a group of products?

(A) That are closely related.

(B) That are marketed through the same channel.

(C) That perform a similar function for being sold to the same customers.

(D) All of the above

(v) The Product Market matrix comprising of Strategies of Market Penetration, Market Development, Product Development, and Diversification was first formulated by

(A) Ansoff

(B) Drucker

(C) Porter

(D) Prahlad

(vi) Price fixation for the first time takes place when

(A) a company develops or acquires a new product.

(B) introducing existing product into a new geographic area or a new distribution channel.

(C) a service, the company bids for a new contract work.

(D) All of the above

Answer: 6

(i) - (D) A course of action or choice of alternatives, specifying the resources required to achieve certain stated objectives.

(ii) - (C) The competitive rivalry in the industry is severe.

(iii) - (B) Redesigning operational processes.

(iv) - (D) All of the above.

(v) - (A) Ansoff.

(vi) - (D) All of the above.

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

7. (a) 'There are primarily three levels of strategies in the organisation'. List the three levels. Build up one or two meaningful sentences to clarify the role of each level.

(b) What is meant by SWOT analysis? 8+4=12

Answer: 7(a)

There are primarily three levels of strategies in the organisation.

i) Corporate Level
ii) Business Level
iii) Functional Level

i) Corporate Level:

The corporate level of management consisting of the chief executive officer (CEO), other senior executives, the board of directors, and corporate staff, empowered in decision-making within the organisation, is to oversee the development of strategies for the whole organisation. This role includes defining the mission and goals of the organisation, determining what businesses it should be in, allocating resources among the different businesses, formulating and implementing strategies that span individual businesses, and providing leadership for the organisation.

ii) Business Level:

A business unit is a self-contained division (with its own functions-for example, finance, purchasing, production, and marketing departments) that provides a product or service for a particular market. The strategic role of these managers is to translate the general statements of direction and intent that come from the corporate level into concrete strategies for individual businesses..

iii) Functional Level:

Functional-level managers are responsible for the specific business functions or operations (human resources, purchasing, product development, customer service, and so on) that constitute a company or one of its divisions. Thus, a functional manager's sphere of responsibility is generally confined to one organizational activity, whereas general managers oversee the operation of a whole company or division.

Answer: 7(b)

SWOT Analysis: Gathering data about the general, operating, and internal environments provides the raw material from which to develop a picture of the organizational environment.

SWOT analysis refines this body of information by applying a general framework for understanding and managing the environment in which an organisation operates. The acronym SWOT stands for Strengths, Weaknesses, Opportunities, and Threats.. In many respects, the sophisticated analytical techniques discussed throughout the text are further refinements of basic SWOT analysis. In addition, SWOT is an excellent way to begin a case analysis. SWOT analysis attempts to assess the internal strengths and weaknesses of an organisation and the opportunities and threats that its external environment presents. SWOT seeks to isolate the major issues facing an organisation through careful analysis of each of these four elements. Managers can then formulate strategies to address key issues.

The purpose of such appraisal is to express, qualitatively or quantitatively, which areas of the business have strengths to exploit, and which areas have weaknesses which must be improved. Although every area of the business should be investigated, only the areas of significant strength or weakness should warrant further attention

8. (a) Categorise seven-steps process of Contingency Planning.

(b) How does Matrix Organisation Structure differ from SBU Structure? Analyse related advantages and disadvantages of Matrix Organisation Structure. 6+6=12

Answer: 8(a)

Steps in Contingency Planning

Step 1 - Identify the beneficial and unfavourable events that could possibly derail the strategy or strategies.

Step 2 - Specify trigger points. Calculate about when contingent events are likely to occur. Step 3 - Assess the impact of each contingent event. Estimate the potential benefit or harm, of each contingent event.

Step 4 - Develop contingency plans. Be sure that contingency plans are compatible with current strategy and are economically feasible.

Step 5 - Assess the counter impact of each contingency plan. That is, estimate how much each contingency plan will capitalize on or cancel out its associated contingent event. Doing this will quantify the potential value of each contingency plan.

Step 6 - Determine early warning signals for key contingency event. Monitor the early warning signals.

Step 7 - For contingent event with reliable early warning signals, develop advance action plans to take advantage of the available lead time.

Answer: 8(b)

SBU Organisation Structure consist of flow of authority from top to bottom i.e. vertical flow whereas Matrix Organisation Structure contains both vertical and horizontal flow of communications or authority. This type of structure is frequently used in IT organization for managing different projects. Each individual project is managed by a project manager and projects manager will have his team arranged under him.

Advantages:

(i) Useful for some specific industries like Information Technology, Healthcare etc.

(ii) Employee can see visible results of their efforts

(iii) Remove barrier to communications

(iv) Managing projects are easy

(v) Effective structures when environment is very dynamic

Disadvantages:

(i) Complex structure as this contains both vertical and horizontal flow of information

(ii) High cost approach due to more management positions

(iii) Dual lines of authority

(iv) Conflicts arises in the allocation of resources

9. Write short notes on any three of the following: 4×3=12

(a) Corporate Planning

(b) Definition of the terms 'Re-engineering' and 'Process' in Business Process Re-engineering

(c) Stages of Strategic Management Framework

(d) Steps involved in the formulation of production strategy

Answer: 9(a)

Corporate Planning is concerned with determination of objectives treating the company as a whole. It develops means to achieve the company's overall objectives. The corporate plans may relate to achieve corporate objectives for short-run and/or long-run. It is an integrated systems approach considering different functions, divisions and units of the organization. Such corporate plans are framed at the corporate level by the top management.

Answer: 9(b)

Re-engineering is 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.

Process is a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization. Each process is composed of related steps or activities that use people, information, and other resources to create value for customers.

Answer: 9(c)

The basic framework of strategic management involves five stages:

Stage 1: In this stage, organisation analyse about their present situation in terms of their Strengths, Weaknesses, Opportunities and Threats.

Stage 2: In this stage, organisations setup their missions, goals and objectives by analysing where they want to go in future.

Stage 3: In this stage organisation analyses various strategic alternatives to achieve their - goals and objectives. The alternatives are analysed in terms of what business portfolio/product mix to adopt, expansion, merger, acquisition and divestment options etc. are analysed to achieve the goals.

Stage 4: In this organisations select the best suitable alternatives in line with their SWOT analysis

Stage 5: This is implementation stage in which organisation implement and execute the selected alternatives to achieve their strategic goals and objectives.

Answer: 9(d)

The following steps are 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.