

1.

- (i) (C)
- (ii) (D)
- (iii) (B)
- (iv) (A)
- (v) (C)
- (vi) (B)
- (vii) (C)
- (viii) (C)
- (ix) (B)
- (x) (C)
- (xi) (A)
- (xii) (A)
- (xiii) (A)
- (xiv) (A)
- (xv) (C)

SECTION – B

2. (a)

Today's production system is characterized by the following features:

(i) **Manufacturing as Competitive Advantage:**

Unlike the past, today 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 but only some techniques which the companies are employing to gain competitive advantage.

(ii) **Services Orientations :**

Service sector is gaining greater relevance these days. The production system, therefore, needs to be organized keeping in mind the peculiar requirements of the service component. The entire manufacturing needs to be geared to serve (a) intangible and perishable nature of the services, (b) constant interaction with clients or customers, (c) small volumes of production to serve local markets, and (d) need to locate facilities to serve local markets.

(iii) **Disappearance of Smokestacks :**

Protective labour legislation, environmental movement and gradual emergence of knowledge based organizations 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.

(iv) **Small has Become Beautiful :**

E.F. Schumacher, in his famous book Small is Beautiful, opposed giant organizations and increased specialization. He advocated, instead, intermediate technology based on smaller working units, community ownership, and regional workplaces utilizing local labor 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 organizations and mass production systems.

2. (b)

The Characteristics of Good Product design is appended below:

- (i) Product Quality: The product must satisfy the needs of the end customers while providing optimum value. The performance should be at par with the expectations.
- (ii) The product must be reliable and worthy for paying for the same.
- (iii) The product must be designed at an optimum cost to be offered at an affordable price to the target customers.
- (iv) The product must be having a shorter design to market lead time.
- (v) The aesthetics/looks of the product must create an immediate impression in the minds of the customers.
- (vi) The product must be easily maintainable and reproducible.
- (vii) The product must be compatible, user-friendly and upgradable with availability of after sales support (e.g., spare parts).
- (viii) The product should balance between standardized basic features and customized augmented features.
- (ix) A detailed specification.
- (x) The product must be safe to use, error proof and should not harm the environment and users.

3. (a)

The Functions involved in Production Control are aligned as follows:

- (i) Planning the production operations in detail.
- (ii) Routing, i.e., laying down the path for the work to follow and the order in which the various operations will be carried out,
- (iii) Scheduling, i.e., establishing the quantity of work to be done, and fixing the time table for performing the operations,
- (iv) Dispatching, i.e., issuing the necessary orders, and taking necessary steps to ensure that the time targets set in the schedules are effectively achieved,
- (v) Follow-up, taking necessary steps to check up whether work proceeds according to predetermined plans and how far there are variances from the standards set earlier,
- (vi) Inspection, i.e., conducting occasional check-ups of the products manufactured or assembled to ensure high quality of the production.

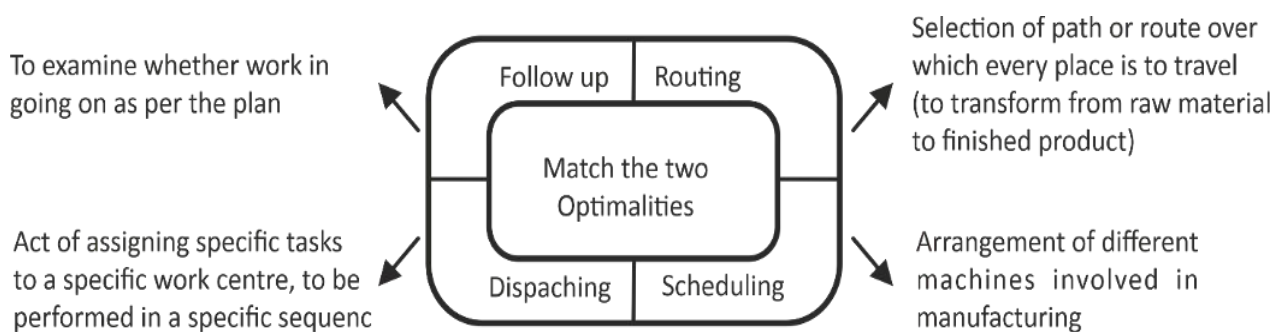


Figure : Techniques of Production Control

3. (b)

(i) The equation of Straight line Trend is $Y_e = a + b\chi$

$$Y_e = 63 + 0.30\chi$$

(ii) Assessment of Sales (in Lakh Tonnes) for :

Year 2014 = 61.50 Lakh Tonnes.

Year 2028 = 65.70 Lakh Tonnes.

4. (a)

Step – 1: Matrix after Row Operation.

	COUNTER			
Salesman	P	Q	R	S
A	8	24	12	0
B	6	15	6	0
C	10	25	10	0
D	6	15	9	0

Step – 2 : Matrix after Column Operation.

	COUNTER				
Salesman	P	Q	R	S	
A	2	9	6	0	
B	0	0	0	0	
C	4	10	4	0	
D	0	0	3	0	(1)

The numbers of allocated cells are not equal to the number of rows. Hence, the solution is not optimal.

(i) The revised table is prepared by considering the least uncovered value 2, and adjusting it with uncovered cell values and those lying at the intersection of lines.

	COUNTER				
Salesman	P	Q	R	S	
A	0	7	4	0	
B	0	0	0	2	
C	2	8	2	0	
D	0	0	3	2	(1)

TABLES - 3

(ii) Minimum number of lines to cover all zeros equal 4 which matches with the order to the Matrix (as shown in Table – 3). Assignments made are shown with squares as shown in Table – 4.

	COUNTER				
Salesman	P	Q	R	S	
A	0	7	4	∅	
B	∅	∅	0	2	
C	2	8	2	0	
D	∅	0	3	2	(2)

The optimal assignment is:

Salesman	COUNTER	Service time (Hour)
A	P	30
B	R	11
C	S	18
D	Q	23
	TOTAL	82

4. (b)

(i) Statement showing allocation of Random Numbers

Production Per day	Probability	Cumulative Probability	Random Number Assigned
45	0.03	0.03	00 – 02
46	0.05	0.08	03 – 07
47	0.07	0.15	08 – 14
48	0.10	0.25	15 – 24
49	0.15	0.40	25 – 39
50	0.20	0.60	40 – 59
51	0.15	0.75	60 – 74
52	0.10	0.85	75 – 84
53	0.07	0.92	85 – 91
54	0.05	0.97	92 – 96
55	0.03	1.00	97 – 99

Simulation Work Sheet:

SL. No.	Random No.	Production per day	Capacity of Train	No. of Trucks waiting in the Factory	Trucks Shipped	No. of empty Space on the train
01.	37	49	51		49	2
02.	35	49	51		49	2
03.	63	51	51		51	--
04.	25	49	51		49	2
05.	50	50	51		50	1
06.	71	51	51		51	--
07.	95	54	51	3	51	--
08.	16	48	51	--	51	3
09.	55	50	51	--	50	1
10.	53	50	51	--	50	1
TOTAL				3		12

- (ii) Average number of Trucks waiting in the factory = 0.30
- (iii) Average number of Empty Space in the Train = 1.20

5. (a)

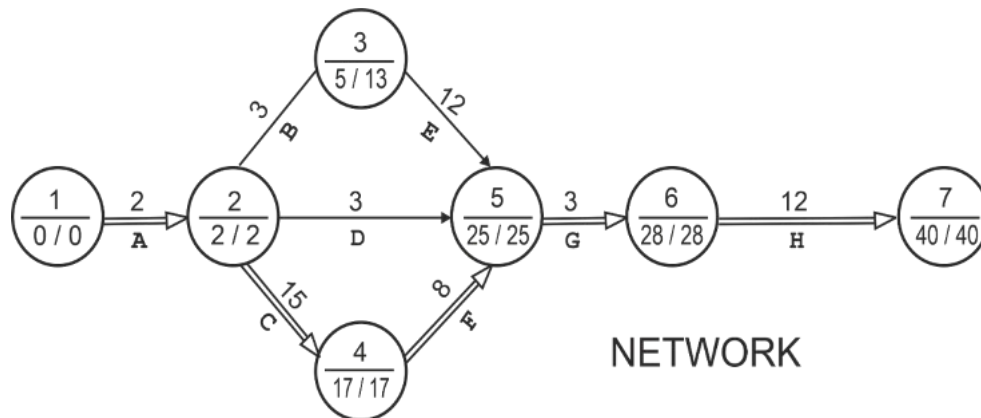
(i) The average Annual Costs to date for each year are assessed below :

COST OF OWNING AND OPERATING TRUCK (₹ IN THOUSAND)

Year (t)	Running Costs	Cumulative Running Cost	Resale value	Depreciation (Capital Cost)	Total Costs	Average cost per year
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	100	100	300	300	400	400
2.	120	220	150	450	670	335
3.	140	360	75	525	885	295
4.	180	540	37.50	562.5	1102.5	275.63
5.	230	770	20	580	1350	270
6.	280	1050	20	580	1630	271.67
7.	340	1390	20	580	1970	281.43
8.	400	1790	20	580	2370	296.25

(ii) After analysis of the parameter stated Supra, we conclude that the truck should be replaced at the end of the Fifth year, of which average annual Cost (₹ 270000) is minimum; otherwise the average annual cost would increase after fifth year.

5. (b)



Critical Path and duration (in days) 1 – 2 – 4 – 5 – 6 – 7 and 40 days

Activity and Identification		Duration Days	DAYS						
			EST	LST	EFT	LFT	Total Float	Free Float	Independent Float Free-Tail
A	1 – 2	2	0	0	2	2	0	0	0
B	2 – 3	3	2	10	5	13	8	0	0
C	2 – 4	15	2	2	17	17	0	0	0
D	2 – 5	3	2	22	5	25	20	20	20
E	3 – 5	12	5	13	17	25	8	8	0
F	4 – 5	8	17	17	25	25	0	0	0
G	5 – 6	3	25	25	28	28	0	0	0
H	6 – 7	12	28	28	40	40	0	0	0

6. (a)

The objectives of Strategic Management are aligned as under:

- (i) To identify opportunities and adapt resources to exploit the opportunities created.
- (ii) To create opportunities by stretching the resources and competences of the organization and capitalize them.
- (iii) To help managers to understand the key relationships among actions, context, and performance by providing the conceptual frameworks.
- (iv) To help an organization enjoy competitive advantage.
- (v) To sustain and improve the competitive position by the deployment and acquisition of appropriate resources and by monitoring and responding to environmental changes.
- (vi) To monitor and remain responsive to the demands of key stakeholders.
- (vii) To identify the critical success factors and meet the needs and wants of the customers.
- (viii) To avoid failure by focusing on the building blocks of competitive advantage (superior efficiency, superior quality, superior innovation and superior responsiveness to customers), instituting continuous improvement and learning, tracking the best industrial practices and using benchmarking.
- (ix) To overcome inertia and accept the changes in the ever-changing environment to remain competitive and at times to survive.
- (x) To develop a creative and innovative attitude and to think strategically.

6. (b)

The different types of Digital Marketing strategies are demonstrated below:

1. Social Media Marketing Platforms:

Today's consumers are highly reliant on social media platforms such as Instagram, Facebook, LinkedIn, and Snap chat. This is why it is essential that brands are active across accounts. Social media platforms allow marketers to reach their prospects in a myriad of ways.

2. Influencer Marketing:

Another effective way to harness digital channels to reach target audiences is with influencer marketing. Brands can partner with celebrities, sites, or others that are considered experts in their field, that share similar values.

3. **Email Marketing:**

Email marketing campaigns allow organizations to stay connected with prospects and customers, sending them customized newsletters or offers based on past shopping history or brand engagements.

4. **Content Marketing:**

Content marketing allows marketing teams to be proactive in answering their users' questions. Marketing teams create content, videos, and other assets to answer questions or provide context to consumers throughout the three stages of the buyer's journey as (i) The Awareness Stage (ii) The Consideration stage and (iii) The Decision Stage.

5. **Search Engine Optimization (SEO) Marketing:**

Search engine optimization often goes hand in hand with content marketing. When the customer from the above example is conducting research for which gym shoes to buy, they will probably click on one of the first three results that appear on Google.

6. **Pay-per-click (PPC):**

Pay-per-click is a form of paid advertising that allows marketing teams to essentially purchase traffic to their website. Marketers place ads on websites or search engines such as Google and Microsoft Bing, and pay a fee each time the ad is clicked on.

7. **Affiliate Marketing:**

Affiliate marketing is similar to referral programs; it involves working with outside individuals or companies under the agreement that they promote your product in exchange for a commission from each sale that can be attributed to their efforts.

8. **Mobile Marketing:**

Mobile marketing initiatives can include many of the digital marketing strategies mentioned above, and typically will leverage a combination of text messages, social media, email, push notifications, and mobile applications.

7. (a)

PESTEL framework covers six main types of environmental influences, namely, Political, Economic, Social, Technological, Environmental and Legal. All these influences create both opportunities as well as threats depending upon the situation.

Political instability poses threats to business organizations whereas, Political stability and a favourable government creates opportune business environment.

Economic growth leads to an increase in customer expenditures which in turn gives companies the opportunity to expand operations and earn higher profits. On the contrary Recession increases competitive pressures and decreases customer expenditures causing a threat to the companies.

Social influences include changing cultures and demographics. Demographic forces are outcomes of changes in the characteristics of a population, such as age, gender, ethnic origin, race, sexual orientation, and social class. Like the other forces in the general environment, demographic forces present managers with opportunities and threats and can have major implications for organizations.

Technological influences refer to innovations such as artificial intelligence, internet, nano-technology, or the rise of new composite materials.

Environmental stands specifically for 'green' issues, such as pollution and waste. The environmental factors have now become extremely important for organisations as countries across the globe are increasingly concerned with the environmental changes and are striving towards clean, green and renewable sources of energy.

Legal embraces Legislative constraints or changes such as health and safety Legislation or restriction on Company mergers and acquisitions.

7. (b)

The Techniques for improving strategic decision making are enumerated below:

Devil's advocacy

It requires the generation of a plan, and a critical analysis of that plan. One member of the decision-making group acts as the devil's advocate, emphasizing all the reasons that might make the proposal unacceptable. In this way, decision makers can become aware of the possible perils of recommended courses of action.

Dialectic inquiry

It is more complex because it requires the generation of a plan (a thesis) and a counter-plan (an antithesis) that reflect plausible but conflicting courses of action. Strategic managers listen to a debate between advocates of the plan and counter-plan and then decide which plan will lead to higher performance. The purpose of the debate is to reveal the problems with the definitions, recommended courses of action, and assumptions of both plans.

The outside view

It requires planners to identify a reference class of analogous past strategic initiatives, determine whether those initiatives succeeded or failed, and evaluate the project at hand against those prior initiatives.

Group Think

- Concept was given by psychologist Irvin Janis.
- It occurs when a group of decision makers embarks upon a course of action without questioning underlying assumptions.
- Typically, a group coalesces (unites) around a person or policy.
- It ignores or filter out information that can be used to question the policy and develops after the fact rationalizations for its decision.
- Commitment to the mission or goals becomes based on an emotional rather than an objective assessment of the correct course of action.
- The consequences can be poor decisions.

8. (a)

The design tests are analyzed as follows:

(i) **The Market-Advantage Test:**

This test of fit with market strategy is fundamental, following Alfred Chandler's classic principle that 'structure follows strategy'. For example, if coordination between two steps in a production process is important to market advantage, then they should probably be placed in the same structural unit.

(ii) **The Parenting Advantage Test:**

The structural design should fit the 'parenting' role of the corporate Centre.

(iii) **The People Test:**

The structural design must fit the people available. It is dangerous to switch completely from a functional structure to a multidivisional structure if, as is likely, the organization lacks managers with competence in running decentralized business units.

(iv) **The Feasibility Test:**

This is a catch-all category, indicating that the structure must fit legal, stakeholder, trade union or similar constraints.

(v) **The Specialized Cultures Test:**

This test reflects the value of bringing together specialists so that they can develop their expertise in close collaboration with each other. A structure fails if it breaks up important specialist cultures.

(vi) **The Difficult Links Test:**

This test asks whether a proposed structure will set up links between parts of the organizations that are important but bound, to be strained.

(vii) **The Redundant Hierarchy Test:**

Any structural design should, be checked in case it has too many layers of management, causing undue blockages and expense. Delaying in response to redundant hierarchies has been an important structural trend in recent years.

(viii) **The Accountability Test:**

This test stresses the importance of clear lines of accountability, ensuring the control and commitment of managers throughout the structure.

(ix) **The Flexibility Test:**

In a fast-moving world, an important test is the extent to which a design will allow for change in the future. For instance, divisional domains should be specified broadly enough to allow divisional managers to follow new opportunities as they emerge.

8. (b)

The commonalities or characteristics that guide BPR are as follows:

- (i) Combining several jobs into one.
- (ii) Allowing workers to make decisions.
- (iii) Performing the steps of a process in a natural order.
- (iv) Recognition that processes have multiple versions and designing processes to take account of different situations.
- (v) Reducing checks and controls to the point where they make economic sense.
- (vi) Minimizing reconciliation.
- (vii) Appointing a case manager to provide a single point of contact at the interface between processes.
- (viii) Performing process where it makes the most sense e.g. if the accounting department needs pencils, it is probably cheaper for such a small order to be purchased directly from the office equipment store along the block than to be order via the firm's purchasing department.
- (ix) Reconciling centralization with decentralization in process design, e.g. a shared database, decentralized decision can be made while permitting overall coordination simply through information sharing.