INTERMEDIATE EXAMINATION

ANSWERS TO PRACTICE TEST PAPER **TERM –JUNE 2026**

PAPER – 9 **SYLLABUS 2022**

OPERATIONS MANAGEMENT AND STRATEGIC MANAGEMENT

Time Allowed: 1 Hour **Full Marks: 100**

Answer all questions. Each question carries 2 marks.

SECTION – A (Compulsory)

1. Choose the correct option: **[15 x 2 =30]**

(i) **Operations Management is primarily deals with:**

- **a. Recruitment and training of employees**
- **b. Conversion of inputs into outputs using physical resources**
- **c. Financial planning and budgeting**
- **d. Market research and promotion**

(ii) **For Quality Assurance in Design, Production, Installation and Servicing the _____ model is be used.**

- **a. ISO 9002 Model**
- **b. ISO 9001 Model**
- **c. ISO 9003 Model**
- **d. none of the above**

(iii) **Continuous improvement in TQM is also known as:**

- **a. Six Sigma**
- **b. Benchmarking**
- **c. KAIZEN**
- **d. JIT**

(iv) **The Growth phase of the Product Life Cycle is characterized by:**

- **a. Decline in market share and profits**
- **b. Rapid increase in sales and market expansion**
- **c. Withdrawal of the product from the market**
- **d. Lack of promotional activity**

(v) **Predecessor Activity means:**

- **a. Activity that must be completed prior to the start of an Activity**
- **b. Activity that must be completed subsequent to the start of an Activity**
- **c. Activities which can occur simultaneously**
- **d. Activity between two events**

(vi) **Those events where more than one activity ends and from where more than one Activity starts these are called:**

- **a. Merge Event**
- **b. Burst Event**
- **c. Merge & Burst Event**
- **d. None of these**

(vii) **A path of the Network with the critical series of activities known as:**

a. Slack Path
b. Float Path
c. Independent Path
d. Critical Path

(viii) **Which constraint refers to the specific deliverables and work required to complete a project?**

a. Time
b. Cost
c. Scope
d. Quality

(ix) **One reason for replacing a machine before its expected life is:**

a. To reduce factory space
b. To avoid preventive maintenance
c. To reduce running costs and increase productivity
d. To increase downtime

(x) **Which of the following is NOT a classification of spare parts?**

a. Regular spares
b. Insurance spares
c. Capital spares
d. Temporary Spares

(xi) **What does the "F" in the FAST goal-setting framework stand for?**

a. Frequently discussed
b. Financially viable
c. Fully achievable
d. Fully transparent

(xii) **What is the primary purpose of a vision statement in an organization?**

a. To outline the company's current operations and processes.
b. To define the desired future state and aspirations of the organization.
c. To list the company's products and services.
d. To describe the company's financial goals.

(xiii) **Which among the following is/are not the part of SMART goal framework?**

a. Specific
b. Measurable
c. Accessible
d. All of the above

(xiv) **Environment is also called source of threats, which among the following option/s is/are correct given below for source of threat:**

a. Hostile shifts in Market Demand
b. New regulatory requirements
c. Both (a) & (b)
d. None of the above

(xv) **According to the image, BPR has resulted in major gains in which three areas?**

a. Marketing, sales, and advertising. Satisfaction
b. Efficiency, quality, and speed.
c. Hiring, training, and retention.
d. Finance, accounting, and auditing.

Answer:

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)
b	b	c	b	a	c	d	c	c	d	a	b	d	c	b

SECTION – B

(Answer any five questions out of seven questions given. Each question carries 14 Marks)

[5 x 14 = 70]

2. (a) A well-planned layout is essential for efficient production and smooth operations. Explain this statement by discussing the importance and benefits of a good layout. [7]

(b) Describe the characteristics of good product Design. [7]

Answer:

(a) Importance of layout:

The importance of a layout can be described as under:

Avoidance of Bottlenecks: Bottlenecks refer to 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. Bottlenecks are caused by inadequate machine capacity, inadequate storage space or low speed on the part of the operators. The results of bottlenecks are delays in production schedules, congestion, accidents and wastage of floor area. All these may be overcome with an efficient layout.

Avoidance of Unnecessary and Costly Changes: A planned layout avoids frequent changes which are difficult and costly. The incorporation of flexibility elements in the layout would help in the avoidance of revisions.

Better Production Control: Production control is concerned with the production of a product of the right type at the right time and at reasonable cost. A good plant layout is a requisite of good production control and provides the plant control officers with a systematic basis upon which to build organisation and procedures.

Better Supervision: A good plant layout ensures better supervision in two ways: (a) Determining the number of workers to be handled by a supervisor and (b) Enabling the supervisor to get a full view of the entire plant at one glance. A good plant layout is, therefore, the first step in good supervision.

Economies in Handling: Nearly 30 per cent to 40 per cent of the manufacturing costs are accounted for by materials handling. Every effort should, therefore, be made to cut down this cost. Long distance movements should be avoided and specific handling operations must he eliminated.

Effective Use of Available Area: Every unit of the plant area is valuable, especially in urban areas. Efforts should therefore, be made to make use of the available area by planning the layout properly.

Improved Employee Morale: Employee morale is achieved when workers are cheerful and confident. This state of mental condition is vital to the success of any organisation. Morale depends on better working conditions; better employee facilities; reduced number of accidents; and increased earnings.

Improved Quality Control: Timely execution of orders will be meaningful when the quality of the output is not below expectations. To ensure quality, inspection should be conducted at different stages of manufacture. An ideal layout provides ample space to carryout inspection to ensure better quality control.

Improved Utilisation of Labour: A good plant layout is one of the factors in effective utilisation of labour. It makes possible individual operations, the process and flow of materials handling in such a way that the time of each worker is effectively spent on productive operations.

Minimisation of Production Delays: Repeat order and new customers will be the result of prompt execution of orders. Every management should try to keep to the delivery schedules by minimising delays in production.

Minimum Equipment Investment: Investment on equipment can be minimised by planned machine balance and location, minimum handling distances, by the installation of general purpose machines and by planned machine loading. A good plant layout provides all these advantages.

(b) A good product design must ensure the following:

(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 compatible, user-friendly and upgradable with availability of after sales support (e.g., spare parts).

(vii) The product must be easily maintainable and reproducible.

(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) An electric company which generates and distributes electricity conducted a study on the life of poles. The repatriate life data are given in the following table:

Life data of electric poles:

Year after installation:	1	2	3	4	5	6	7	8	9	10
Percentage poles failing:	1	2	3	5	7	12	20	30	16	4

Calculate:

- **If the company now installs 5,000 poles and follows a policy of replacing poles only when they fail, how many poles are expected to be replaced each year during the next ten years? To simplify the computation, assume that failures occur and replacements are made only at the end of a year.**
- **If the cost of replacing individually is ₹ 160 per pole and if we have a common group replacement policy it costs ₹80 per pole, calculate the optimal period for group replacement.[7]**

(b) From the following time series data of sale project compute the sales for the next three years.

Year	2017	2018	2019	2020	2021	2022	2023
Sales (₹000 units)	80	90	92	83	94	99	92

[7]

Answer:

(a) **Chart showing Optimal Replacement Period**

Average life of the pole - $1 \times 0.01 + 2 \times 0.02 + 3 \times 0.03 + 4 \times 0.05 + 5 \times 0.07 + 6 \times 1.2 + 7 \times 0.20 + 8 \times 0.3 + 9 \times 0.16 + 10 \times 0.04 = 7.05$ years.

No. of poles to be replaced every year = $\frac{5000}{7.05} = 709$

Average yearly cost on individual replacement = 709 × ₹160 = ₹1,13,440.

Group Replacement: Initial Cost = 5,000 × ₹80 = ₹ 4,00,000.

Year	No. of poles to be replaced	Yearly cost of individual replacement @ ₹ 160/pole (₹)	Cumulative cost of individual replacement (₹)	Total cost of individual replacement as well as group replacement (₹)	Average Annual Cost = Total Cost Year (₹)
1	5,000 × 0.01 = 50	8,000	8,000	4,08,000	4,08,000
2	5,000 × 0.02 + 50 × 0.01 = 101	16,160	24,160	4,24,160	2,12,080
3	5,000 × 0.03 + 50 × 0.02 + 101 × 0.01 = 152	24,320	48,480	4,48,480	1,49,493
4	5,000 × 0.05 + 50 × 0.03 + 101 × 0.02 + 152 × 0.01 = 256	40,960	89,440	4,89,440	1,22,360
5	5,000×0.07+50×0.05+101×0.03 + 152 × 0.02 + 256 × 0.01 = 362	57,920	1,47,360	5,47,360	1,09,472
6	5,000 × 0.12 + 50 × 0.07 + 101 × 0.05 + 152 × 0.03 + 256 × 0.02 + 362 × 0.01 = 6023	9,63,680	11,11,040	15,11,040	2,51,840

Optimal replacement at the end of the 5th year.

(b) Computation of Trend Values

Years	Time Deviation from 2020 X	Sales in (` 000 units) Y	Squares of time dev. X^2	Product of time Deviations and sales XY
2017	–3	80	9	–240
2018	–2	90	4	–180
2019	–1	92	1	–92
2020	0	83	0	0
2021	+1	94	1	+94
2022	+2	99	4	+198
2023	+3	92	9	+276
n = 7	ΣX = 0	ΣY = 630	$\Sigma X^2 = 28$	ΣXY = + 56

Regression equation of Y on X

Y = a + bX

To find the values of a and b

$a = \frac{\Sigma Y}{n} = \frac{630}{7} = 90$

$b = \frac{\Sigma XY}{X^2} = \frac{56}{28} = 2$

Hence regression equation comes to Y = 90 + 2X. With the help of this equation, we can project the trend values for the next three years, i.e., 2024, 2025 and 2026.

Y_{2024} = 90 + 2(4) = 90 + 8 = 98 (000) units.

Y_{2025} = 90 + 2(5) = 90 + 10 = 100 (000) units.

Y_{2026} = 90 + 2(6) = 90 + 12 = 102 (000) units.

4. (a) Six men are available for different jobs. From past records the time in hours taken by different persons for different jobs are given below.

		Jobs					
		1	2	3	4	5	6
Men	1	2	9	2	7	9	1
	2	6	8	7	6	14	1
	3	4	6	5	3	8	1
	4	4	2	7	3	10	1
	5	5	3	9	5	12	1
	6	9	8	12	13	9	1

Apply appropriate methods to obtain an allocation of men to different jobs which will lead to minimum operation time. **[7]**

(b) As a tool service centre, the arrival rate is two per hour and the service potential is three per hour. Simple queue conditions exist.

The hourly wage paid to the attendant at the service centre is ₹1.50 per hour and the hourly cost of a machinist away from his work is ₹4.

Calculate:

(i) The average number of machinists being served or waiting to be served at any given time.

(ii) The average time a machinist spends waiting for service.

(iii) The total cost of operating the system for an eight – hour day.

(iv) The cost of the system if there were two attendants working together as a team, each paid ₹ 1.50 per hour and each able to service on average 2 per hour. [7]

Answer:

(a)

Man \ Job	1	2	3	4	5	6
1	2	9	2	7	9	1
2	6	8	7	6	14	1
3	4	6	5	3	8	1
4	4	2	7	3	10	1
5	5	3	9	5	12	1
6	9	8	12	13	9	1

Row operation * (Table-1)

Man \ Job	1	2	3	4	5	6
1	1	8	1	6	8	0
2	5	7	6	5	13	0
3	3	5	4	2	7	0
4	3	1	6	2	9	0
5	4	2	8	4	11	0
6	8	7	11	12	8	0

* Matrix is obtained by subtracting min. element of each row of the given Matrix from all the elements of the corresponding row.

Column Operation* (Table - 2)

Man \ Job	1	2	3	4	5	6
1	0	7	0	4	1	0
2	4	6	5	3	6	0
3	2	4	3	0	0	0
4	2	0	5	0	2	0
5	3	1	7	2	4	0
6	7	6	10	10	1	0

* Matrix is obtained by subtracting min. element of each column of Table - 1 from all the elements of the corresponding column.

Table – 3

Man \ Job	1	2	3	4	5	6
1	[0]	7	0	4	1	0
2	4	6	5	3	6	[0]
3	2	4	3	[0]	0	0
4	2	[0]	5	0	2	0
5	3	1	7	2	4	0
6	7	6	10	10	1	0

All the zeros obtained in Table - 2 are covered by minimum no. of horizontal and vertical straight lines and shown above. Here order of the given matrix = 6 and minimum no. of horizontal and vertical lines = 4. As $4 \neq 6$, the solution is non optimal.

Table – 4

Man \ Job	1	2	3	4	5	6
1	[0]	7	0	4	1	1
2	3	5	4	2	5	[0]
3	2	4	3	[0]	0	1
4	2	[0]	5	0	2	1
5	2	0	6	1	3	0
6	6	5	9	9	0	0

Above table is obtained by subtracting minimum uncovered element of Table - 3 from all the uncovered elements and by adding the same to all the elements at the junction of the intersecting straight lines.
Minimum no. of horizontal and vertical straight lines to cover all the zeros = 5 ≠ 6 (order of the matrix).
So, the solution is non optimal.

Table – 5

Man \ Job	1	2	3	4	5	6
1	~~0~~	9	[0]	6	~~3~~	3
2	1	5	2	2	5	[0]
3	[0]	4	1	[0]	~~0~~	1
4	0	0	3	0	2	1
5	0	[0]	4	1	3	~~0~~
6	4	5	7	9	[0]	~~0~~

Above table is obtained by subtracting minimum uncovered element (2) of Table - 4 from all the uncovered elements and by adding the same to all the elements at the junction of the intersecting straight lines.
Here minimum no. of horizontal or vertical straight lines to cover all the zeros = 6 = Order of the Matrix.
So, the solution is optimal.

Table - 6 Showing Optimum Solution – 1

Man \ Job	1	2	3	4	5	6
1	~~0~~	9	[0]	6	3	3
2	1	5	2	2	5	[0]
3	[0]	4	1	~~0~~	~~0~~	1
4	~~0~~	~~0~~	3	[0]	2	1
5	~~0~~	[0]	4	1	3	~~0~~
6	4	5	7	9	[0]	~~0~~

Table - 7 Showing Optimum Solution – 2

Man \ Job	1	2	3	4	5	6
1	~~0~~	9	[0]	6	3	3
2	1	5	2	2	5	[0]
3	~~0~~	4	1	[0]	~~0~~	1
4	[0]	~~0~~	3	~~0~~	2	1
5	~~0~~	[0]	4	1	3	~~0~~
6	4	5	7	9	[0]	~~0~~

Table - 8 Showing Optimum Solution – 3

Man \ Job	1	2	3	4	5	6
1	~~0~~	9	[0]	6	3	3
2	1	5	2	2	5	[0]
3	~~0~~	4	1	[0]	~~0~~	1
4	~~0~~	[0]	3	~~0~~	2	1
5	[0]	~~0~~	4	1	3	~~0~~
6	4	5	7	9	[0]	~~0~~

So, the Optimal Assignments are as follows:

As per Table - 6			As per Table - 7			As per Table - 8		
Man	**Job**	**Time (hrs.)**	**Man**	**Job**	**Time (hrs.)**	**Man**	**Job**	**Time (hrs.)**
1	3	2	1	3	2	1	3	2
2	6	1	2	6	1	2	6	1
3	1	4	3	4	3	3	4	3
4	4	3	4	1	4	4	2	2
5	2	3	5	2	3	5	1	5
6	5	9	6	5	9	6	5	9
Total	–	22	**Total**	–	22	**Total**	–	22

(b) Arrival rate = λ = 2 per hour

Service rate = μ = 3 per hour

(i) Average number of machinists being served or waiting to be served at any given time:

$$L_S = \frac{\lambda}{(\mu-\lambda)} = \frac{2}{(3-2)} = \frac{2}{1} = 2$$

(ii) Average Time a machinist spends waiting for the services:

$$W_q = \frac{\lambda}{\mu} \times \frac{1}{(\mu-\lambda)} = \frac{2}{3} \times \frac{1}{(3-2)} = 0.667 \text{ hours}$$

It means a machinist spends 40 minutes (i.e., 60 × 0.667) in the queue.

(iii) Average time in the system

$$W_S = \frac{1}{(\mu-\lambda)} = \frac{1}{(3-2)} = 1 \text{ hours}$$

Average number of machinists in the system = 2 [As per (i) above]

Cost of machinists being away from work = ₹ 4 × w_s = ₹ 4.00 per hour

Attendant cost = ₹ 1.50 per hour

₹ 5.50 per hour

Cost of 8 - hour day = 8 hrs × ₹ 5.50 = ₹44.00

(iv) It is assumed that there is still a single service point, but the average service rate with 2 attendants now is 4 per hour

∴ Now λ = 2 per hour

μ = 4 per hour

∴ Average number of machinists in the system = $L_S = \frac{\lambda}{(\mu-\lambda)} = \frac{2}{(4-2)} = 1$

Average time spent by a machinist in the system = $W_S = \frac{1}{(\mu-\lambda)} = \frac{1}{(4-2)} = \frac{1}{2}$ hour

Machinists cost = ½ hr × ₹4 =	₹ 2.00
Attendant cost (@ 1.50 per attendant × 2 attendants	₹3.00
Total Cost	₹ 5.00

Cost per 8- hour day = ₹5 × 8hrs. = ₹40.00

5. (a) A pension fund manager is considering investing in two shares A and B. It is estimated that:

(i) Share A will earn a dividend of 12% per annum and share B 4% per annum.

(ii) Growth in the market value in one year of share A will be 10 paise per ₹1 invested and in B 40 paise per ₹ 1 invested.

He requires investing the minimum total sum which will give:

Dividend income of at least ₹ 600 per annum and growth in one year of at least ₹1,000 on the initial investment.

You are required to:

Prepare mathematical formulation of the problem which will facilitate computation of the minimum sum to be invested to meet the manager's objective. [7]

(b) XYZ Auto-manufacturing company has to prepare a design of its latest model of motorcycle. The various activities to be performed to prepare design are as follows:

Activity	Description of activity	Preceding activity
A	Prepare drawing	—
B	Carry out cost analysis	A
C	Carry out financial analysis	A
D	Manufacture tools	C
E	Prepare bill of material	B, C
F	Receive material	D, E
G	Order sub-accessories	E
H	Receive sub-accessories	G
I	Manufacture components	F
J	Final assembly	I, H
K	Testing and shipment	J

Prepare an appropriate network diagram. [7]

Answer:

(a)

Shares	Dividend	Growth in ₹
A	12%	10/100 = 0.1
B	4%	40/100 = 0.4
Min-income	600	1000

Let x_1 be the amount invested on share A

Let x_2 be the amount invested on share B

Objective function: Min. $Z = x_1 + x_2$

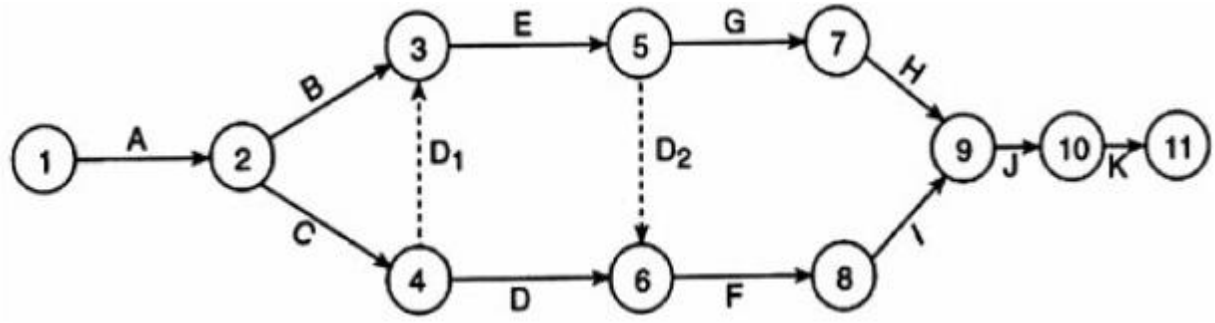
Subject to constraints:

$0.12\ x1 + 0.04\ x2 \geq 600$ (Dividend income constraint)

$0.1\ x1 + 0.4\ x2 \geq 1000$ (Growth constraint)

And $x1, x2 \geq 0$. (Non-negativity constraint)

(b) The network diagram will be as follows:



Where D1 and D2 are dummy activities.

6. (a) Explain what is Balanced Score Card. Identify the steps involved in Balanced Score Card. [7]

(b) Summarize the important component of Block Chain. [7]

Answer:

(a) The balanced score card was developed by Robert S. Kaplan and David Norton of Harvard Business School. This system tries to do away with the overemphasis on short term financial objectives and tries to improve organisational performance by focusing attention on measuring a wide range of non-financial, operational objectives. Later, the system also tried to incorporate the strategic planning technique.

The balanced score card approach involves the following steps:

- The first step involves establishing the organisation's strategic intent including the vision and mission.

- In the second step, the design of the balanced score card is determined by identifying the specific measures related to the four perspectives namely, financial, customer, internal and learning or innovation perspective. In this step the specific strategies that should be formulated and implemented to realise the organisation's vision is also determined.
- The next step involves strategy mapping through identification of organisational activities that are derived from the strategies.
- In the final step, quantitative measures or metrics should be established to measure accurately the performance of the organisation in the specific areas.

(b) The important components of a block chain include:

Distributed ledger technology

All network participants have access to the distributed ledger and its immutable record of transactions. With this shared ledger, transactions are recorded only once, eliminating the duplication of effort that's typical of traditional business networks.

Immutable records

No participant can change or tamper with a transaction after it's been recorded to the shared ledger. If a transaction record includes an error, a new transaction must be added to reverse the error, and both transactions are then visible.

Smart contracts

A smart contract is stored on the blockchain and executed automatically. A smart contract can define conditions for corporate bond transfers; include terms for travel insurance to be paid and much more. A smart contract acts a set of rules and allows fastest transactions.

- **The benefits of blockchain network**

  Increased trust

  As block chain is used by only the members who are within a defined network. This assures the members that the data being received by them is accurate and timely data. Moreover, the confidential blockchain records will be shared only with network members to whom one has specifically granted access.

  Greater security

  The increase security in blockchain network arises from the fact that consensus on data accuracy is required from all network members, and all validated transactions are immutable because they are recorded permanently. No one, not even a system administrator, can delete a transaction.

  Increased efficiencies

  With a distributed ledger that is shared among members of a network, time-wasting record reconciliations are eliminated. The smart contract enables automated transactions thereby saving on time.

7. (a) Discuss the concept of PESTEL Framework. **[7]**

(b) Discuss Porter's five forces framework. **[7]**

Answer:

(a) The PESTEL framework categorises environmental influences into six main types: political, economic, social, technological, environmental and legal. Politics highlights the role of governments.

(i) **Political** processes shape a society's laws, which constrain the operations of organisations and managers and thus create both opportunities and threats. Political instability creates adverse conditions for the businesses to function. Investors rarely want to invest in countries where there is political turmoil and this in turn can be detrimental to the businesses in those regions. On the other hand, political stability and favourable government attitude towards businesses can create a lot of opportunities and is considered to be a favourable business environment.

(ii) **Macroeconomic forces** affect the general health and well-being of a nation or the regional economy of an organisation which in turn affect companies' and industries' ability to earn an adequate rate of return. The four most important macroeconomic forces are the growth rate of the economy, interest rates, currency exchange rates, and inflation (or deflation) rates.

- Economic growth tends to ease competitive pressures within an industry as it leads to an expansion in customer expenditures. This gives companies the opportunity to expand their operations and earn higher profits. On the other hand, economic decline (a recession) increases competitive pressures as leads to a reduction in customer expenditures.
- Interest rates can determine the demand for a company's products. Interest rates are important whenever customers routinely borrow money to finance their purchase of these products. Interest rates are also important because they influence a company's cost of capital, and therefore its ability to raise funds and invest in new assets. The lower the interest rates the lower the cost of capital for companies and more opportunities for investment.
- Currency exchange rates define the comparative value of different national currencies. Movement in currency exchange rates has a direct impact on the competitiveness of a company's product.
- Price inflation can destabilise the economy, producing slower economic growth, higher interest rates, and volatile currency movements. If inflation continues to increase, investment planning will become hazardous. The key characteristic of inflation is that it makes the future less predictable. Price deflation also has a destabilizing effect on economic activity. If prices fall, the real price of fixed payments goes up. This is damaging for companies and individuals with a high level of debt who must make regular fixed payments on that debt.

(iii) **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 organisations.

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

(v) **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. The disposal of e –waste and global warming are also very important causes of concern. Organisations need to be more environment friendly.

(vi) Finally **legal** embraces legislative constraints or changes, such as health and safety legislation or restrictions on company mergers and acquisitions.

For managers, it is important to analyse how these factors are changing now and how they are likely to change in the future, drawing out implications for the organisation. Many of these factors are linked together. Key drivers for change are the high-impact factors likely to affect significantly the success or failure of strategy. Typical key drivers will vary by industry or sector. For example, the key driver for a computer manufacturer may be technological change. Public sector managers are likely to be concerned with social change (for example, an ageing population), political change (changing government funding and policies) and legislative change (introducing new requirements). Identifying key drivers for change helps managers to focus on the PESTEL factors that are most important and which must be addressed as the highest priority.

(b) The five forces are discussed hereunder:

Risk of Entry by Potential Competitors

Potential competitors are companies that are not currently competing in an industry, but have the capability to do so if they choose. Established companies are those which are already operating in an industry. They often attempt to discourage potential competitors from entering the industry because as more companies enter, it becomes more difficult for established companies to protect their share of the market and generate profits. A high risk of entry by potential competitors represents a threat to the profitability of established companies. The greater the costs potential competitors must bear to enter an industry, the greater the barriers to entry, and the weaker this competitive force. High entry barriers may keep potential competitors out of an industry even when industry profits are high.

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Economies of Scale

Economies of scale arise when unit costs fall as a firm expands its output. Sources of scale economies include cost reductions gained through mass producing a standardized output; discounts on bulk purchases of raw material inputs and component parts; the advantages gained by spreading fixed production costs over a large production volume; and the cost savings associated with distributing, marketing, and advertising costs over a large volume of output. If the cost advantages from economies of scale are significant, a new company that enters the industry and produces on a small scale suffers a significant cost disadvantage relative to established companies. If the new company decides to enter on a large scale in an attempt to obtain these economies of scale, it must raise the capital required to build large-scale production facilities and bear the high risks associated with such an investment. In addition, an increased supply of products will depress prices and result in vigorous retaliation by established companies, which constitutes a further risk of large-scale entry. For these reasons, the threat of entry is reduced when established companies have economies of scale.

Brand Loyalty

Brand loyalty exists when consumers have a preference for the products of established companies. A company can create brand loyalty by continuously advertising its brand-name products and company name, patent protection of its products, product innovation achieved through company research and development (R&D) programs, an emphasis on high-quality products, and exceptional after-sales service. Significant brand loyalty makes it difficult for new entrants to take market share away from established companies. Thus, it reduces the threat of entry by potential competitors; they may see the task of breaking down well-established customer preferences as too costly.

Absolute Cost Advantages

Sometimes established companies have an absolute cost advantage relative to potential entrants, meaning that entrants cannot expect to match the established companies' lower cost structure. Absolute cost advantages arise from three main sources: (1) superior production operations and processes due to accumulated experience, patents, or trade secrets; (2) control of particular inputs required for production, such as labour, materials, equipment, or management skills, that are limited in their supply; and (3) access to cheaper funds because existing companies represent lower risks than new entrants. If established companies have an absolute cost advantage, the threat of entry as a competitive force is weaker.

Customer Switching Costs

Switching costs arise when a customer invests time, energy, and money switching from the products offered by one established company to the products offered by a new entrant. When switching costs are high, customers can be locked into the product offerings of established companies, even if new entrants offer better products.

Government Regulations

Historically, government regulation has constituted a major entry barrier for many industries. The competitive forces model predicts that falling entry barriers due to government deregulation will result in significant new entry, an increase in the intensity of industry competition, and lower industry profit rates.

Rivalry Among Established Companies

The second competitive force is the intensity of rivalry among established companies within an industry. Rivalry refers to the competitive struggle between companies within an industry to gain market share from each other. The competitive struggle can be fought using price, product design, advertising and promotional spending, direct-selling efforts, and after-sales service and support. Intense rivalry implies lower prices or more spending on non-price-competitive strategies, or both. Because intense rivalry lowers prices and raises costs, it squeezes profits out of an industry. Thus, intense rivalry among established companies constitutes a strong threat to profitability. Alternatively, if rivalry is less intense, companies may have the opportunity to raise prices or reduce spending on non-price competitive strategies, leading to a higher level of industry profits. Four factors have a major impact on the intensity of rivalry among established companies within an industry: (1) industry competitive structure, (2) demand conditions, (3) cost conditions, and (4) the height of exit barriers in the industry.

Industry Competitive Structure

The competitive structure of an industry refers to the number and size distribution of companies in it, something that strategic managers determine at the beginning of an industry analysis. Industry structures vary, and different structures have different implications for the intensity of rivalry.

A fragmented industry consists of a large number of small or medium-sized companies, none of which can determine industry price.

- Low-entry barriers and commodity-type products that are difficult to differentiate characterize many fragmented industries. This combination tends to result in boom-and-bust cycles as industry profits rapidly rise and fall.
- Low-entry barriers imply that new entrants will flood the market, hoping to profit from the boom that occurs when demand is strong and profits are high. Often the flood of new entrants into a booming, fragmented industry creates excess capacity, and companies start to cut prices in order to use their spare capacity. The difficulty companies' face when trying to differentiate their products from those of competitors can exacerbate this tendency. The result is a price war, which depresses industry profits, forces some companies out of business, and deters potential new entrants. A fragmented industry structure, then, constitutes a threat rather than an opportunity.
- Economic boom times in fragmented industries are often relatively short-lived because the ease of new entry can soon result in excess capacity, which in turn leads to intense price competition and the failure of less efficient enterprises. Because it is often difficult to differentiate products in these industries, trying to minimize costs is the best strategy for a company so it will be profitable in a boom and survive any subsequent bust. Alternatively, companies might try to adopt strategies that change the underlying structure of fragmented industries and lead to a consolidated industry structure in which the level of industry profitability is increased.
- A consolidated industry is dominated by a small number of large companies (an oligopoly) or, in extreme cases, by just one company (a monopoly), and companies often are in a position to determine industry prices.
- In consolidated industries, companies are interdependent because one company's competitive actions (changes in price, quality, etc.) directly affect the market share of its rivals, and thus their profitability.
- When one company makes a move, this generally "forces" a response from its rivals, and the consequence of such competitive interdependence can be a dangerous competitive spiral.
- Rivalry increases as companies attempt to undercut each other's prices, or offer customers more value in their products, pushing industry profits down in the process.
- Companies in consolidated industries sometimes seek to reduce this threat by following the prices set by the dominant company in the industry.

Industry Demand

- The level of industry demand is another determinant of the intensity of rivalry among established companies.
- Growing demand from new customers or additional purchases by existing customers tend to moderate competition by providing greater scope for companies to compete for customers.
- Growing demand tends to reduce rivalry because all companies can sell more without taking market share away from other companies. High industry profits are often the result.
- Conversely, declining demand results in increased rivalry as companies fight to maintain market share and revenues (as in the breakfast cereal industry example).

- Demand declines when customers exit the marketplace, or when each customer purchases less. When this is the case, a company can only grow by taking market share away from other companies. Thus, declining demand constitutes a major threat, for it increases the extent of rivalry between established companies.

Cost Conditions

The cost structure of firms in an industry is a third determinant of rivalry.

- Fixed costs are the costs that must be paid before the firm makes a single sale.
- In industries where fixed costs are high, profitability tends to be highly leveraged to sales volume, and the desire to grow volume can spark intense rivalry.
- Moreover, in industries where the fixed costs of production are high, firms cannot cover their fixed costs and will not be profitable if sales volume is low. Thus they have an incentive to cut their prices and/or increase promotional spending to drive up sales volume in order to cover fixed costs.
- In situations where demand is not growing fast enough and too many companies are simultaneously engaged in the same actions; the result can be intense rivalry and lower profits.
- Research suggests that the weakest firms in an industry often initiate such actions, precisely because they are struggling to cover their fixed costs.

Exit Barriers

Exit barriers are economic, strategic, and emotional factors that prevent companies from leaving an industry. If exit barriers are high, companies become locked into an unprofitable industry where overall demand is static or declining. The result is often excess productive capacity, leading to even more intense rivalry and price competition as companies cut prices, attempting to obtain the customer orders needed to use their idle capacity and cover their fixed costs. Common exit barriers include the following:

- Investments in assets such as specific machines, equipment, or operating facilities those are of little or no value in alternative uses, or cannot be later sold. If the company wishes to leave the industry, it must write off the book value of these assets.
- High fixed costs of exit, such as severance pay, health benefits, or pensions that must be paid to workers who are being made laid off when a company ceases to operate.
- Emotional attachments to an industry, such as when a company's owners or employees are unwilling to exit from an industry for sentimental reasons or because of pride.
- Economic dependence on the industry because a company relies on a single industry for its entire revenue and all profits.
- The need to maintain an expensive collection of assets at or above a minimum level in order to participate effectively in the industry.
- Bankruptcy regulations, particularly in the United States, bankruptcy provisions allow insolvent enterprises to continue operating and to reorganise under this protection. These regulations can keep unprofitable assets in the industry, result in persistent excess capacity, and lengthen the time required to bring industry supply in line with demand.

The Bargaining Power of Buyers

The third competitive force is the bargaining power of buyers. An industry's buyers may be the individual customers who consume its products (end-users) or the companies that distribute an industry's products to end-users, such as retailers and wholesalers. The bargaining power of buyers refers to the ability of buyers to bargain down prices charged by companies in the industry, or to raise the costs of companies in the industry by demanding better product quality and service. By lowering prices and raising costs, powerful buyers can squeeze profits out of an industry. Powerful buyers, therefore, should be viewed as a threat. Alternatively, when buyers are in a weak bargaining position, companies in an industry can raise prices and perhaps reduce their costs by lowering product quality and service, thus increasing the level of industry profits. Buyers are most powerful in the following circumstances:

- When the buyers have choice of who to buy from. If the industry is a monopoly, buyers obviously lack choice. If there are two or more companies in the industry, the buyers clearly have choice.
- When the buyers purchase in large quantities. In such circumstances, buyers can use their purchasing power as leverage to bargain for price reductions.
- When the supply industry depends upon buyers for a large percentage of its total orders.
- When switching costs are low and buyers can pit the supplying companies against each other to force down prices. When it is economically feasible for buyers to purchase an input from several companies at once so that buyers can pit one company in the industry against another.
- When buyers can threaten to enter the industry and independently produce the product, thus supplying their own needs, also a tactic for forcing down industry prices.

The Bargaining Power of Suppliers

The fourth competitive force is the bargaining power of suppliers—the organisations that provide inputs into the industry, such as materials, services, and labour (which may be individuals, organisations such as labour unions, or companies that supply contract labour). The bargaining power of suppliers refers to the ability of suppliers to raise input prices, or to raise the costs of the industry in other ways for e.g., by providing poor-quality inputs or poor service. Powerful suppliers squeeze profits out of an industry by raising the costs of companies in the industry. Thus, powerful suppliers are a threat. Conversely, if suppliers are weak, companies in the industry have the opportunity to force down input prices and demand higher-quality inputs (such as more productive labour). As with buyers, the ability of suppliers to make demands on a company depends on their power relative to that of the company. Suppliers are most powerful in these situations:

Substitute Products

The final force in Porter's model is the threat of substitute products: the products of different businesses or industries that can satisfy similar customer needs. For example, companies in the coffee industry compete indirectly with those in the tea and soft drink industries because all three serve customer needs for non-alcoholic drinks.

- The existence of close substitutes is a strong competitive threat because this limits the price that companies in one industry can charge for their product, which also limits industry profitability. If the price of coffee rises too much relative to that of tea or soft drinks, coffee drinkers may switch to those substitutes.

- If an industry's products have few close substitutes (making substitutes a weak competitive force), then companies in the industry have the opportunity to raise prices and earn additional profits.

Complementors

Andrew Grove, the former CEO of Intel, is of the opinion that both substitutes and complements influence demand in an industry. He has argued that Porter's original formulation of competitive forces ignored a sixth force: the power, vigour, and competence of complementors.

According to Grove, complementors are companies that sell products that add value to (complement) the products of companies in an industry because, when used together, the use of the combined products better satisfies customer demands. For example, the complementors to the PC industry are the companies that make software applications to run on the computers. The link between PCs and software applications can be expressed as greater the supply of high-quality software applications running on these machines, the greater will be the value of PCs to customers resulting in increased demand for PCs and ultimately increased profitability of the PC industry.

8. (a) Demonstrate in brief the Project-based organizational structures and their advantages and disadvantages. [7]

(b) Align the aspects of Goal Congruence. [7]

Answer:

(a)

❖ **Project-based structures**

A project-based structure is one where teams are created, undertake the work and are then dissolved. This can be particularly appropriate for organisations that deliver large and expensive goods or services (civil engineering, information systems, films) or those delivering time-limited events (conferences, sporting events or consulting engagements). The organisation structure is a constantly changing collection of project teams created, steered and glued together loosely by a small corporate group. Many organisations use such teams in a more ad hoc way to complement the 'main' structure. For example, taskforces are set up to make progress on new elements of strategy or to provide momentum where the regular structure of the organisation is not effective.

Advantages of Project-based structures

- ❖ The project-based structure can be highly flexible, with projects being set up and dissolved as required.
- ❖ Accountability and control are good because project teams should have clear tasks to achieve within a defined life.
- ❖ Projects can be effective at knowledge exchange as project team members will typically be drawn from different departments within the firm.
- ❖ Projects can also draw members internationally and, because project life spans are typically short, project teams may be more willing to work temporarily around the world.

Disadvantages of Project-based structures

- ❖ Without strong programme management providing overarching strategic control, organisations are prone to proliferate projects in an ill-coordinated fashion.
- ❖ The constant breaking up of project teams can also hinder the accumulation of knowledge over time or within specialisms.

(b) Aspects of Goal Congruence

The following are some of the areas that have the ability to create goal congruence:

i. Communication and Understanding

Channels of communication and how goals are perceived are important to achieve goal congruence. Operational managers have a responsibility of being aware as to what actions are desirable and what goals are to be achieved. It should be understood that the communication of different goals can occur through informal channels, which involves meetings and face to face interactions, or through formal channels including budgets or other financial documents. There is a inherent risk that even if the communication is well executed, it might be perceived in different ways. Organisations, therefore, should internalise the goals in a good manner to avoid that employees feel inability to achieve them.

ii. Create direction

One of the reasons for lack of goal congruence is the absence of direction related to employees' behaviour. Performance management and goals facilitate efficient communication about what managers want their subordinates to focus on. It needs no mention that providing clear information and direction, employees can better understand what is expected from them, how to perform adequately, and how to contribute effectively to the achievement of the organisational goals. There is a need to increase the employees understanding of the strategic objectives as well as the organisation's value drivers.

iii. Motivation

The problem of motivation can exist even though employees have knowledge about how to perform adequately because employees can act in their own self-interest instead of in the organisation's best interest. The employees can make their own performance report better by allocating resources without befitting the organisation as a whole. One of the strongest reasons for demotivation among employees and managers is dislike for the work allocated. The reason for motivation varies among employees. While some employees feel motivated for some recognition and appraisals others may feel motivated because of commitment and responsibility without any required pay off. The more motivated the employees of the organisation the better will be the goal congruence.

iv. Incentives

In order to increase the likelihood of employees working to achieve their individual goals, organisation's aim to influence motivation by providing incentives. Research suggests that individuals tend to perform better when they are rewarded. Rewards and compensations should create goal congruence between individual goals and organisational goals by stimulating individuals to perform by providing incentives, as rewards are related to increased effort.

v. Connection

It is very important to create a connection between goals, performance measures and incentives. In order to align the employees' self-interest and overall organisational objectives it is necessary to relate incentives with performance. By linking incentives to certain goals, individuals tend to pay more attention to what is important.