EX/PRN/HS/B/T/413/2024

B. Printing Engineering Examination, 2024

(4th Year, 1st Semester)

INDUSTRIAL MANAGEMENT

Time: 3 hrs. **Full marks: 100.**

(Attempt any one from (a) and (b) in Question No 1.)

1a. (i) Define inventory. Why they are maintained? (4)

(ii) Describe: **Direct inventories, Indirect inventories** with suitable examples. (6)

(iii) A printing machine manufacturer uses **60,000** items per year and the use is fairly constant at **5000 items per month.** Each item price **Rs. 1.50.** The carrying cost for the company has been estimated at **15%** of average inventory investment. The cost to place order and process the delivery is **Rs. 30.**

(a) Calculate **economic order quantity,**

(b) What is the **stock turnover rate** ignoring safety stock, if **EOQ is ordered frequently**?

(c) what will be **the effect on total cost,** if stock turnover rate is reduced to **1:3** by infrequent ordering? (10)

1b. (i) What is **Economic order Quantity**?

Derive the formula for determining **EOQ.** (10)

(ii) With the help of a neat diagram explain the following terms :

(A) Order quantity (B) Lead time

(C) Safety stock (D) Re-order point. (10)

[Turn over

(Attempt any one from (a) and (b) in Question No 2.)

2a. (i) Name the various **function** of **management.**
Describe any one of them in brief. (14)

(ii) Name the various elements of planning. (6)

2b. (i) Name the various types of **Organisation Structures** and explain any one of them with its advantages and disadvantages. (12)

(ii) **State the essential elements of good Organisation.** (8)

(Attempt any one from (a) and (b) in Question No 3.)

3a. (i) Explain the following in connection with the **Break-Even-Chart** with a **neat sketches** :

(A) **Break-Even Points;** (B) **Margine of safety;**
(C) **Profit volume ratio;** (D) **Angle of incidence.** **(12)**

(ii) **Describe** the effect of **increase or decrease** in **fixed costs** and **variable costs** on **B.E.P.**, with the help of **neat sketches.** (8)

3b. (i) **State** the **formula** for calculating:
(a) **B.E.P.** in terms of **number of units.** (5)
(b) **B.E.P.** in terms of **sales revenue.** (5)

(ii) The fixed cost of a press is **Rs. 4,00,000.** The estimated sales is **Rs. 10,00,000.** The variable cost per unit is **Rs. 20.** The selling price of each product is **Rs. 100.**
Determine the following:.
(A) **Break -even point,**
(B) **Minimum number** of products to earn **profit,**
(C) **Profit earned** at a turn-over of **Rs. 8,00,000,**
(D) **Margin of safety.** **(10)**

(Attempt any one from (a) and (b) in Question No 4.)

4a. (i) Define marketing. Explain the importance of marketing in modern world. (10)

(ii) **Explain** the **role of packaging** in **marketing.** (10)

4b. (i) State the **various functions** of maintenance. (10)

(ii) **Describe** the **relationship** between **preventive maintenance** and **breakdown maintenance.** How will you **decide** the extent of **preventive maintenance** from the **economy point** of view. (10)

(Attempt any one from (a) and (b) in Question No 5.)

5a. (i) **Define** the terms:

(A) Event (B) Activity

(C) Critical Activity (D) Dummy **(8)**

(ii) What is **PERT?** Define **Optimistic time, most likely time** and **Pessimistic time** and explain how you will estimate the **expected time** complete the activity in **PERT technique.** **(12)**

5b. The network for a construction project as shown in the **FIGURE-1,** with the three time estimates of each activity marked.

Determine:

(A) **Critical path** and its **standard deviation.**

(B) **Probability** of completion of project in **40 days.**

(C) Time duration that will provide **95% (Z=1.65)** probability of its completion time. **(20)**

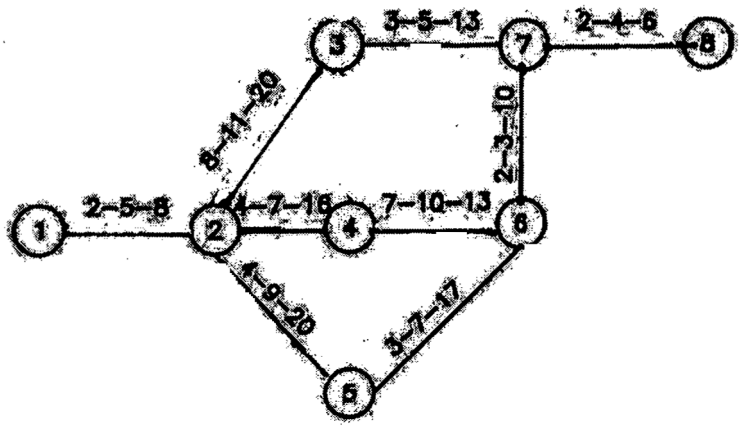

FIGURE - 1.

(Attempt any one from (a) and (b) in Question No 6.)

6a. (i) How the productivity can be **increased**? What are the **various tools** of **productivity improvement**? (10)

(ii) **State** the benefits of increasing productivity to :

(A) Management; (B) Workers;

(C) Government; (D) Nations; (10)

6b. (i) **Describe** the **factors** to be consider for achieving economy in **material management.** (10)

(ii) **Describe** the **duties, functions** and **responsibilities** of purchasing Department. (10)

(Attempt any one from (a) and (b) in Question No 7.)

7a. (i) **Name** and **describe** the **various factors** affecting **forecasting.** **(10)**

(ii) Calculate the forecast the demand for the following series by **Exponential smoothing** method : (10)

Period	1	2	3	4	5	6	7	8	9	10
Actual Demand	10	12	08	11	09	10	15	14	16	15

7b. (i) **Describe 'Least Square Method ' of forecasting** with its **advantages** and **limitations.** **(8)**

(ii) Find the **trend** by **least square method** for data as follows:

Year	2016	2017	2018	2019	2020	2021	2022
Demand in 1000 units	90	100	102	94	104	98	95

Also **estimate** the demand for **2025.**

(12)

(Attempt any two from (a),(b) and (c) in Question No 8.)

8. (a) **Define** the terms: (A) **Quality performance**
(B) **Statistical quality control** (10)

(b) What is meant by **process capability**?
How will you **determine** it? (10)

(c) Control chart for $\bar{X}$ are to be prepared for a certain dimension of component. The subgroup size is 4. After 20 subgroups it is found that **$\Sigma\bar{X}$ = 825.60 mm** and **ΣR = 5.6 mm.** Compute the central line and the control limits for $\bar{X}$ chart. Take **d2= 2.059.**
If the Specifications are **41.0±0.40 mm** and the process is in control and is normally distributed, can it meet the specification requirement?
(10)