Roll No. ....

NCV 2010

Total No. of Questions – **7**

Total No. of Printed Pages – **8**

Time Allowed – **3 Hours**

Maximum Marks – **100**

HBN

Answers to questions are to be given only in English except in the case of candidates who have opted for Hindi medium. If a candidate has not opted for Hindi medium, his answers in Hindi will not be valued.

Question No. **1** is compulsory.

Answer any **five** questions from the remaining **six** questions.

Working notes should form part of the answer.

Marks

1. (a) A potato chips manufacturing company decided that the mean net weight per pack of its product must be 90 grams. A random sample of 16 packets yields a mean weight of 80 grams with standard deviation of 17.10 grams. Test the hypothesis that the mean of the whole universe is less than 90, use level of significance of (a) 0.05 (b) 0.01.   5

    (b) What are the steps involved in Zero-base budgeting ?   5

    (c) G Ltd. produces and sells 95000 units of 'X' in a year at its 80% production capacity. The selling price of product is ₹ 8 per unit. The variable cost is 75% of sales price per unit. The fixed cost is ₹ 3,50,000. The company is continuously incurring losses and management plans to shut-down the plant. The fixed cost is expected to be reduced to ₹ 1,30,000. Additional costs of plant shut-down are expected at ₹ 15,000.   5

    Should the plant be shut-down ? What is the capacity level of production of shut-down point ?

(d) H Ltd. manufactures three products. The material cost, selling price and bottleneck resource details per unit are as follows :

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	Product X	**Product Y**	**Product Z**
Selling price (₹)	66	75	90
Material and other variable cost (₹)	24	30	40
Bottleneck resource time (minutes)	15	15	20

Budgeted factory costs for the period are ₹ 2,21,600. The bottleneck resources time available is 75120 minutes per period.

Required :

(i) Company adopted throughput accounting and products are ranked according to 'product return per minute'. Select the highest rank product.

(ii) Calculate throughput accounting ratio and comment on it.

2. (a) E Ltd. manufactures and sells four types of products under the brand names A, B, C and D. On a turnover of ₹ 30 crores in 2009, company earned a profit of 10% before interest and depreciation which are fixed. The details of product mix and other information are as follows :

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Products	**Mix % to total sales**	**P/V Ratio (%)**	**Raw material as % on sales value**
A	30	20	35
B	10	30	40
C	20	40	50
D	40	10	60

Interest and depreciation amounted to ₹ 225 lakhs and ₹ 115.50 lakhs respectively. Due to increase in prices in the international market, the company anticipates that the cost of raw materials which are imported will increase by 10% during 2010. The company has been able to secure a license for the import of raw materials of a value of ₹ 1,535 lakhs at 2010 prices. In order to counteract the increase in costs of raw materials, the company is contemplating to revise its product mix. The market survey report indicates that the sales potential of each of the products : 'A', 'B' and 'C' can be increased upto 30% of total sales value of 2009. There was no inventory of finished goods or work in progress in both the year.

You are required to :

Set an optimal product mix for 2010 and find the profitability.

(b) List out the remedies available for difficulties experienced during implementation of PRAISE.   **4**

3. (a) A company is engaged in manufacturing of several products. The following data have been obtained from the record of a machine shop for an average month :   **10**

Budgeted

No. of working days	24
Working hours per day	8
No. of direct workers	150
Efficiency	one standard hour per clock hour
Down time	10%
Overheads Fixed	₹ 75,400
Variable	₹ 90,720

The actual data for the month of August 2010 are as follows :

Overheads Fixed	₹ 78,800
Variable	₹ 70,870
Net operator hours worked	20500
Standard hours produced	22550

There was a special holiday in August 2010.

Required :

(i)   Calculate efficiency, activity, calendar and standard capacity usages ratio.

(ii) Calculate all the relevant fixed overhead variances.

(iii) Calculate variable overheads expenditure and efficiency variance.

(b)   A firm makes two products X and Y, and has a total production capacity of   6
      16 tonnes per day. X and Y are requiring the same production capacity. The
      firm has a permanent contract to supply at least 3 tonnes of X and 6 tonnes of
      Y per day to another company. Each tonne of X require 14 machine hours of
      production time and each tonne of Y requires 20 machine hours of production
      time. The daily maximum possible number of machine hours is 280. All the
      firm's output can be sold, and the profit made is ₹ 20 per tonne of X and
      ₹ 25 per tonne of Y.

      Required :

      Formulate a linear programme to determine the production schedule for
      maximum profit by using graphical approach and calculate the optimal product
      mix and profit.

4.   Attempt any **four** :

(a)   The following information is given by Z Ltd. :   4

      Margin of safety   ₹ 1,87,500

      Total cost   ₹ 1,93,750

      Margin of safety   7500 units

      Break-even sales   2500 units

      Required :

      Calculate Profit, P/V Ratio, BEP Sales (in ₹) and Fixed Cost.

(b)   Explain the major components of balanced score card.   4

(c) List the 5 steps involved in the methodology of critical path analysis.   4

(d) Calculate the selling price per unit to earn a return of 12% net on capital   4
employed (net of tax @ 40%). The cost of production and sales of 80000 units
are :

Variable cost including material cost   ₹ 9,60,000

Fixed overheads   ₹ 5,00,000

The fixed portion of capital employed is ₹ 12 lakhs and the varying portion is
50% of sales turnover.

(e) What are the steps involved in carrying out Monte Carlo Simulation model ?   4

5.   (a) Fruitolay has decided to increase the size of the store. It wants the information   11
about the probability of the individual product lines : Lemon, grapes and
papaya. It provides the following data for the 2009 for each product line :

	Lemon	Grapes	Papaya
Revenues	₹ 79,350.00	₹ 2,10,060.00	₹ 1,20,990.00
Cost of goods sold	₹ 60,000.00	₹ 1,50,000.00	₹ 90,000.00
Cost of bottles returned	₹ 1,200.00	₹ 0	₹ 0
Number of purchase orders placed	36	84	36
Number of deliveries received	30	219	66
Hours of shelf stocking time	54	540	270
Items sold	12600	110400	30600

Fruitolay also provides the following information for the year 2009 :

Sr. No.	Activity	Description of Activity	Total costs (₹)	Cost allocation basis
1.	Bottle returns	Returning of empty bottles to the store	1,200.00	Direct tracing to product line
2.	Ordering	Placing of orders of purchases	15,600.00	156 purchase orders
3.	Delivery	Physical delivery and the receipts of merchandise	25,200.00	315 deliveries
4.	Self stocking	Stocking of merchandise on store shelves and ongoing restocking	17,280.00	864 hours of time
5.	Customer support	Assistance provided to customers including bagging and checkout	30,720.00	153600 items sold

Required :

(i) Fruitolay currently allocates store support costs (all costs other than the cost of goods sold) to the product line on the basis of the cost of goods sold of each product line. Calculate the operating income and operating income as the percentage of revenue of each product line.

(ii) If Fruitolay allocates store support costs (all costs other than the cost of goods sold) to the product lines on the basis of ABC system, calculate the operating income and operating income as the percentage of revenue of each product line.

(iii) Compare both the systems.

(b) Discuss various forecasting methods using time series. 5

6. (a) A company has three plants located at A, B and C. The production of these plants is absorbed by four distribution centres located at X, Y, W and Z. The transportation cost per unit has been shown in small cells in the following table :   **8**

Distribution Centres / Factories	X	Y	W	Z	Supply (Units)
A	6	9	13	7	6000
B	6	10	11	5	6000
C	4	7	14	8	6000
Demand (units)	4000	4000	4500	5000	18000 / 17500

Find the optimum solution of the transportation problem by applying Vogel's Approximation Method.

(b) Mention the data required to operate the material requirement planning system.   **4**

(c) "Customer profile is important in charging cost." Explain this statement in the light of customer costing in service sector.   **4**

7. (a) A company has two divisions : Division A and Division B. Both divisions of the company manufacture the same product but located at two different places. The annual output of division A is 6000 tons (at 80% capacity) and that of division B is 7500 tons (at 60% capacity). The basic raw material required for production is available locally at both the places, but at division A, it is limited to 4000 tons per annum at the rate of ₹ 100 per ton, at division B, it is limited to 8000 tons per annum at the rate of ₹ 110 per ton. Any additional requirement of material will have to be purchased at a rate of ₹ 125 per ton from other markets at either of division. Variable costs per ton at each division remain constant. For every 1000 tons of output, 800 tons raw material is required. The details of other costs of the divisions are as follows :   **12**

	Division A	Division B
Other variable costs of output (₹)	122 per ton	120 per ton
Fixed cost per annum (₹)	3,80,000	6,00,000

Required :

(i)   Calculate variable cost per ton for each division's product and decide ranking in order of preference.

(ii)   The company desires to fully utilize the available local supplies of raw material to save the overall variable cost of production; keeping the total production of both the divisions putting together is the same as at present level. Calculate the quantity of production (output) that could be transferred between the two divisions and overall saving in variable cost.

(iii) After considering the option (ii), how the balance capacity should be utilized if company is working at 100% capacity, and also calculate selling price per ton if company mark up 10% on full cost of each division's product.

(b)   Explain distinctive features of learning curve theory in manufacturing environment.   4