Q.P. Code: 25451

03 Hrs [Total Marks 80]

N.B.:
(1) **Question No.1 is compulsory**
(2) Attempt any **three** questions out of remaining **five** questions
(3) Figures to right indicate full marks
(4) Assume suitable data if **necessary**.
(5) Notations carry usual meaning.

Q.1 Write short notes on the following (Any four) 20
    i)   Master Production Schedule
    ii)   Limitations of JIT
    iii)   Need of Simulation
    iv)   MRP-1 and MRP-II
    v)   Gantt Chart

Q.2 (A) A small project is composed of 7 activities whose time estimates are listed below 10

Activity	Optimistic (Weeks)	Most likely (Weeks)	Pessimistic (Weeks)
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

    a) Draw the network diagram of activities in the project
    b) What is the expected project length
    c) What is the probability that the project will be completed at least 4 weeks earlier then expected time

(B) The forecast for a group of items is reproduced below 10

Quarter	1	2	3	4	5	6	7	8
Demand	270	220	470	670	450	270	200	370

(a) Suppose the firm estimates that it costs Rs.150 per unit to increase the production rate, Rs.200 per unit to decrease the production rate, Rs.50 per unit per quarter to carry the items on inventory and Rs.100 per unit if subcontracted. Compare the cost incurred if pure strategies are followed.

(b) Given these cost, evaluate the following mixed strategy

The company decides to maintain a constant production rate of 250 units per quarter and permits 20% overtime when the demand exceeds the production rate. The incremental cost of overtime is Rs.25 per hour. It plans to meet the excess demand by hiring and firing of workers.

Q.3 (A) Three grades of coal A, B and C contain phosphorous and ash as impurities. In a particular ind   **12** ustrial process, fuel up to 100 tons (maximum) is required which contain ash not more than 30 % and phosphorous not more than 0.03%.It is desired to maximize the profit while satisfying t hese conditions. There is an unlimited supply of each grade. The percentage of impurities and the profit of grades are given below:

Coal	Phosphorous (%)	Ash (%)	Profit (Rs./ton)
A	0.02	2.0	12
B	0.04	3.0	15
C	0.03	5.0	14

Formulate a problem as LP model and solve.

(B) Solve the following assignment problem for minimization   **8**

	J1	J2	J3	J4
A	18	26	17	11
B	13	28	14	26
C	38	19	18	15
D	19	26	24	10

Q.4 (A) We have six jobs, each of which go through the machine A,B and C in the order of ABC,   **10** Processing time (in hours) are given

Job	1	2	3	4	5	6
Machine A	8	3	7	2	5	1
Machine B	3	4	5	2	1	6
Machine C	8	7	6	9	10	9

Determine the minimum elapsed time ,idle time for machines and idle time for jobs

(B) Explain various functions of MPC.   **05**

(C) Explain the importance of duality in Linear Programming Model.   **05**

Q.5 (A) A materials manager adopts the policy to place an order for a minimum quantity of 500 of a   **10** particular item in order to avail a discount of 10%. It was found from the company record that for last year 8 orders where placed each of size 200 nos. Ordering cost is Rs. 500/- per order inventory carrying charges at 40%. Cost per unit = Rs.400/-. Is the purchase manager justified in his decision? What is the effect of this decision on company?

(B) Write a short note on (i) Capacity Requirement Planning (ii) Qualitative methods of Forecasting   **10**

Q.6 (A) The sales of the company is given below   10

Year	2004	2005	2006	2007	2008	2009	2010
Sales	80	90	92	83	94	99	92

Fit the straight line to the data and find

1) Forecast for the year 2011

2) Coefficient of correlation

3) Standard error of estimate

4) Limits of forecast for 95% confidence level

(B) Determine the extent of deliveries from each of the factories (A,B,C,D) to each stores (1,2,3,4)   10
so that the total production and transportation cost is minimum

	1	2	3	4	supply
A	4	6	8	13	50
B	13	11	10	8	70
C	14	4	10	13	30
D	9	11	13	8	50
Demand	25	35	105	20	

-------------------------XX-------------------------

(3 hours)   **Total Marks: 80**

N.B.:   (1) Question No. 1 is compulsory.
            (2) Solve any THREE questions from remaining FIVE questions.
            (3) Draw neat diagrams and assume suitable data wherever necessary. Justify your assumptions.

1.
  (a)   Compare W-CDMA and CDMA 2000.   (5)

  (b)   What are the advantages of digital modulation over analog modulation?   (5)

  (c)   What do you mean by modulation? Why modulation is required.   (5)

  (d)   What do you understand by radiation intensity and directivity of an antenna?   (5)

2. (a)   What are the different propagation models used in wireless communication? Explain   (10)
            any one of them in detail.

    (b)   Derive a mathematical expression of Frequency modulated signal. Draw the carrier,   (10)
            signal and frequency modulated waveform.

3. (a)   Explain AM demodulation using a diode detector.   (10)

    (b)   Explain and compare, with the help of suitable diagrams, BPSK, BFSK and BASK.   (10)

4. (a)   Explain mechanism of space wave propagation? What are the frequency bands at   (10)
            which space wave propagation take place?

    (b)   With the help of suitable diagram explain Foster Seeley Discriminator method used   (10)
            for FM demodulation.

5. (a)   Explain frequency reuse, co- channel interference and adjacent channel with respect (10)
            to cellular communication.

    (b)   How folded dipole differ from half wave dipole? What are the applications of folded (10)
            dipole?

6. (a)   What do you understand by AWGN and pulse dispersion? How pulse dispersion   (5)
            affect the inter-symbol interference.

    (b)   What are the different types of communication channels explain in detail.   (5)

    (c)   How DSBSC is generated using balance modulator. What are the advantages of   (10)
            DSBSC over DSBFC?