Time: 3hrs.   **Max.Marks: 75**

SECTION-A   (4 x 15=60)
Answer ALL Questions

1 **(a)** Explain different addressing modes with examples.   **[15M]**
                                        Or
(b) Explain Design of Accumulator logic.   **[15M]**

2 **(a)** Write notes on asynchronous data transfer.   **[15M]**
                                        Or
(b) Explain direct memory access?   **[15M]**

3 **(a)** Explain in brief main memory concepts?   **[08M]**
(b) Expalin in brief cache memory.   **[07M]**
                                        Or
(c) Explain the concepts of virtual memory?   **[15M]**

4 **(a)** Explain 8085 Microprocessor Architecture?   **[15M]**
                                        Or
(b) Explain Intel 8085 Microprocessor Instructions?   **[15M]**

SECTION-B   (5 x 3=15M)
Answer any FIVE Questions
5   **Write a short notes on**

 a)   Stack Organization?
 b)   Instruction cycle?
 c)   I/O vs memory bus?
 d)   Priority interrupts?
 e)   Associative memory?
 f)   Memory protection?
 g)   Write short notes on 8085 pin configuration?
 h)   Intel 8085 instructions of Arithmetic and logic group?

Time: 3hrs.   Max. Marks: 75

SECTIONA (4 X 15 = 60 M)
Answer ALL Questions

1.   **a)** Explain the different types of strain gauges. Derive the expression for gauge factor**.(15M)**
                                                                      Or
       b) With a neat diagram, explain the principle and working of LVDT   **(15M)**

2.   **a)** Explain the principle and operation of thermocouple. Also explain the
           Thermocouple laws   **(15M)**
                                                                      Or
       b) What is Pyroelectric Effect? Discuss about radiation laws   **(15M)**

3.   **a)** what is a intelligent sensor. Explain about smart sensor system   **(15M)**
                                                                      Or
       b) Write a short notes on charge coupled sensors and sensors based MOSFET
           Transistors   **(15M)**

4.   **a)** Briefly discuss about MEMS and its applications   **(15M)**
                                                                      Or
       b) Write about MEMS accelerometer   **(15M)**

Section B (5×3=15M)
Answer any Five Questions

5.   **a)** Briefly explain the classification of sensors.
       b)Discuss about RTDs and thermistors.
       c) Explain about different types of thermocouples for different range of operation.
       d) Explain about photovoltaic effect. Explain the application of photovoltaic sensor.
        e) Briefly explain about position encoders.
        f) Write short notes on SAW sensors
        g)Explain the functionality of MEMS based micro actuator.
        h)Discuss the application of MEMS in temperature measurements.

Time: 3hrs.   Max.Marks: 75

SECTION – A   (4x15=60 Marks)
Answer ALL Questions

1. a) Write a brief note on advantages and applications of DBMS   **[08M]**
  b) Briefly explain about Three-Schema Architecture with neat diagram   **[07M]**
Or
  c) Briefly discuss about Database System Environment with neat diagram   **[15M]**
2. a) Explain in detail about various key constraints used in database system with examples **[10M]**
  b) Explain about Relational Algebra Set Operations with examples   **[05M]**
Or
  c) Explain in detail about Tuple and Domain Relational Calculus with examples   **[15M]**
3. a) What is Normalization? Briefly explain the types of normal forms with an example **[15M]**
Or
  b) Explain how a dynamic multi level indexes can be created using B Trees and
    B+ Trees with example.   **[15M]**
4. a) What is Serializability? Briefly explain the different types of Serializability   **[15M]**
Or
  b) Briefly explain the following Concurrency Control Techniques
      i) Two Phase Locking Protocol   **[08M]**
      ii) Validation Concurrency Control   **[07M]**
SECTION – B   (5x3=15 Marks)
Answer any FIVE Questions

  5. **a)** Define DBMS, Schema, Instance. What is weak entity? Explain with example
     b) What is Data Independence? Specify the classification
     c) Give a brief note on Insert, Delete, and Update Queries in SQL with examples
     d) What is View in SQL? Create a view and perform DML operations on it
     e) What is Functional Dependency? Classify.
     f) Give a brief note on Buffering Blocks
     g) What is Transaction? Discuss Characteristics of Transaction
     h) Give a brief note on Shadow Paging technique.

Time: 3hrs.   Max. Marks: 75

SECTIONA (4 X 15 = 60 M)
Answer ALL Questions

1.   **a)** Find the Fourier transform of $\delta(t)$ and $\sin(\omega_0 t)$ **(7M)**
        b) Explain the electronic communication system with neat block diagram.   **(8M)**
                                            Or
        c) What is the principle of amplitude modulation? Derive expression for the AM wave
            and draw its spectrum.   **(7M)**
        d) What are the advantages of SSB transmission over DSB – SC? Why SSB
            transmission not generally used for broad casting applications ?   **(8M)**

2.   **a)** What is multiplexing in communication systems draw the block diagram of FDM
            to transmit five signals.   **(8M)**
        b) Explain the principle of frequency modulation?   **(7M)**
                                            Or
        c) Prove the sampling theorem for the low pass signals. What is the use of anti-aliasing
            filter?   **(8M)**
        d) Compare TDM and FDM?   **(7M)**

3.   **a)** Draw the ASK, PSK, FSK wave forms for digital data 10100110.   **(15M)**
                                            Or
        b) Draw and explain the FSK transmitter. Describe its bandwidth considerations **(7M)**
        c) What is the quantisation in PCM and define quantization error?   **(8M)**

4.   **a)** Explain about Shanon – Fano and Huffman coding ?   **(15M)**
                                            Or
        b) List error detection and correction codes and explain any two codes?   **(15M)**

Section B (5×3=15M)
Answer any Five Questions

5.
        a) Define noise figure, Noise temperature?
        b) Explain about need of modulation?
        c) Compare Pre- emphasis and De- emphasis?
        d) Advantages of FM over AM?
        e) Compare PCM and DM?
        f) Explain about QPSK Modulator?
        g) What is Shanon limit for information capacity?
        h) Explain about convolution codes?

Time: 3hrs.   Max. Marks: 75

SECTIONA (4 X 15 = 60 M)
Answer ALL Questions

1. **a)** Compare the performances of closed loop and open loop control systems.   **(8M)**
    b) Explain the effects of feedback on the system performance.   **(7M)**
    Or
    c) Write the force equations of the linear translational system shown in the figure 1
    below. Draw the equivalent electrical network using force-voltage analogy, with
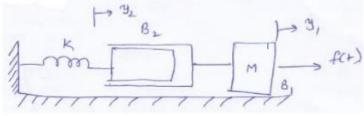   the help of necessary mathematical equations.   **(15M)**

Figure:1

2. **a)** Derive an expression for the transfer function of an armature controlled DC servo motor**(15M)**
    Or
    b) Illustrate the effect of the value of damping ratio on the location of closed-loop
    Poles of a standard second order system.   **(8M)**
    c) The forward transfer function of a unity feedback type1, second order system
    has a pole at -2.The nature of gain K is so adjusted that damping ratio is 0.4.
    The above equation is subjected to input r(t)=1+4t.Find steady state error   **(7M)**

.

3. **a)** A unity feedback control system is characterized by the open loop transfer function
    $G(s) = \dfrac{K(s+11)}{s(s+5)(s+9)}$ Using the Routh criterion
        i) Calculate the range of values of K for the system to be stable.
        ii) What is the marginal value of K for stability? Determine the frequency of
           oscillations if any
        iii)Check for K = 1, all the roots of the characteristic equation of the above system
    have the damping factor greater than 0.   **(15M)**
    Or
    b) A unity feedback system has an open loop function $G(s) = \dfrac{K}{S(S^2+3S+10)}$
    make a rough sketch of root locus plot by determining the following
        i) Centroid, number and angle of asymptotes
        ii) Angle of departure of root loci from the poles,
        iii) Breakaway points if any,
        iv) Points of intersection with jω axis and
        v) Maximum value of k for stability   **(15M)**

4. **a)** Derive the expressions for frequency domain specifications of a second
    order system   **(7M)**
    b) Given damping ratio $\xi = 0.7$ and ω_n=10rad/sec find the resonant Peak,
    resonant frequency and band width   **(8M)**
    Or

c) Explain the procedure to determine the gain margin and phase margin of a system from its Bode plot? **(7M)**

d) A feedback system has G(s) H(s) $= \dfrac{100(s+4)}{s(s+0.5)(s+10)}$ Draw the Bode plot and comment on stability. **(8M)**

Section B (5×3=15M)
Answer any Five Questions

5.

    a) Explain Control System?

    b) What are the advantages of Mathematical Model?

    c) Write Masons gain formula.

    d) Define Signal flow graph.

    e) Define BIBO stability. what is the necessary condition for stability?

    f) Explain dominant pole

    g) Define Resonant Peak.

    h) Explain Gain cross-over frequency and phase cross-over frequency

Time: 3hrs.   **Max. Marks: 75**

SECTION-A (4 X 15 = 60 M)
Answer ALL Questions

1.   **a)** Define Managerial Economics, Explain Nature and Scope of managerial
economics?   **(15M)**

Or

b) What is Demand Forecasting? What are the methods of Demand forecasting?   **(15M)**

2.   **a)** Explain Economies of scale and diseconomies of scale.   **(15M)**

Or

b) Explain the features of Short –run average cost curve and Long –run average
cost curve.   **(15M)**

3.   **a)** Differentiate between Perfect and Imperfect markets.   **(15M)**

Or

b) Explain any four Methods of Pricing based on strategy.   **(15M)**

4.   **a)** What are the Types of Account and rules governing each account?   **(15M)**

Or

b) Journalise the following transactions in the books of madhu and prepare
necessary ledger accounts.
2014 January 1.Madhu commenced with Rs.15,000/-
               2. Paid into bank Rs. 10,000/-
               3. Purchased goods from B for Rs. 2,000/-
               4. Returned goods to B for Rs. 200/-
               5. Paid to B in full settlement of A/c Rs 1,700/-
               7. Received interest from the bank Rs.750/-
               9. Sold goods for cash Rs. 7,000/-
             12. Sold goods for Don for Rs. 4,000/-
             15. Received goods worth Rs. 100/- from Don with a complaint about
                damage.
             16. Paid salaries Rs. 400/-
             17. Entertainment Rs. 50/-
             20. Received a cheque from Don Rs. 500/-
             25. Issued a cheque for Rs. 100/- towards rent to landlord   **(15M)**

Section B (5×3=15M)
Answer any Five Questions

5.   **Write short notes on**
     a) Law of equi – marginal utility
     b) Barometric techniques
     c) Cobb- Douglas production function
     d) Isoquants and their features
     e) Equilibrium price
     f) Joint stock company
     g) Double -entry book –keeping
     h) Types of shares