

Code No. N0523

**R07**

**Set No.1**

**IV B.Tech I Semester Supplementary Examinations, February/March, 2012**

**MOBILE COMPUTING**

**(Common to Computer Science & Engineering, Information Technology  
and Electronics & Computer Engineering)**

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

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1. a) Discuss about the mobile services and data services in GSM. [8]  
b) Describe in detail with the architecture for mobile communications. [8]
2. a) Write in detail about Code division multiple access (CDMA). [8]  
b) What are benefits of reservation schemes? How are collisions avoided during data transmission, why is the probability of collisions lower compared to classical Aloha? What are disadvantages of reservation schemes? [8]
3. a) What is the basic purpose of DHCP? Name the entities of DHCP and give basic DHCP configuration. [8]  
b) List the entities of mobile IP and describe data transfer from a mobile node to a fixed node and vice versa. Why and where is encapsulation needed? [8]
4. a) Discuss about snooping TCP. Also focus on its advantages and its disadvantages. [8]  
b) Explain the usage of selective retransmission in TCP in mobile networks. [8]
5. a) Discuss in detail about different hoarding techniques for databases. [8]  
b) Explain about transactional models in detail. [8]
6. a) Explain in detail about pull based data dissemination mechanism. [8]  
b) Discuss in detail about communication asymmetry and illustrate this with an example. [8]
7. a) Define MANET. Give spectrum of MANET applications in detail. [8]  
b) Name the main differences between multi-hop ad-hoc networks and other networks. What advantages do these ad-hoc networks offer? [8]
8. a) Discuss in detail about hierarchical routing algorithms in mobile adhoc networks. [8]  
b) Describe in detail about security in MANETs. [8]

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**Set No.2**

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**Time: 3 hours**

**Max. Marks: 80**

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1. a) Explain about the concept of localization and calling in detail. Also discuss different types of handover in GSM. [8]  
b) Explain about the novel applications and limitations of mobile computing. [8]
2. a) Explain in detail about multiple access with collision avoidance. [8]  
b) How does the near/far effect influence TDMA systems? What happens in CDMA systems? What are countermeasures in TDMA systems, what about CDMA systems? [8]
3. a) Explain packet flow if two mobile nodes communicate and both are in foreign networks. What additional routes do packets take if reverse tunneling is required? [8]  
b) Explain about IP packet delivery to and from the Mobile nodes and illustrate this with an example. [8]
4. a) Describe in detail about Indirect TCP and discuss several advantages with I-TCP. [8]  
b) Explain about transaction oriented TCP in detail. [8]
5. a) Explain about power aware and context aware computing in detail. [8]  
b) Describe about client server computing with adaption in detail. [8]
6. a) What is communication asymmetry? Discuss about data dissemination in detail. [8]  
b) Describe in detail about selective tuning techniques. [8]
7. a) Explain about Destination sequence distance vector (DSDV) routing in mobile AdHoc networks. [8]  
b) Think of ad-hoc networks with fast moving nodes, e.g., cars in a city. What problems arise even for the routing algorithms adapted to ad-hoc networks? What is the situation on highways? [8]
8. a) Discuss about the treatment of protocols of all layers in WAP. [8]  
b) Describe about the link management in Bluetooth. [8]

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**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

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1. a) Describe in detail about the system architecture of GSM. [8]  
b) Define mobile computing. Discuss about the limitations and applications of mobile computing. [8]
2. a) Tabulate SDMA, TDMA, FDMA and CDMA. [8]  
b) Explain about hidden and exposed terminals in detail. [8]
3. a) Discuss about different ways of registration depending on the location of the COA. [8]  
b) Explain how tunneling works in general and especially for mobile IP using IP-in-IP, minimal, and generic routing encapsulation, respectively. Discuss the advantages and disadvantages of these three methods. [8]
4. a) Give an overview of classical enhancements to TCP for mobility. [8]  
b) Discuss in detail about mobile TCP. [8]
5. a) Describe in detail about quality of service issues. [8]  
b) Explain about recovery in detail. [8]
6. a) Give classification of new data delivery mechanisms. [8]  
b) Explain about indexing techniques for data dissemination. [8]
7. a) Discuss about security in MANETS. [8]  
b) Explain about Dynamic source routing protocol in MANETS. [8]
8. a) Explain about Cluster head-Gateway Switch Routing protocol in detail. [8]  
b) Explain about difficulties in comparison to wired networks, and give the following observations concerning routing can be made for ad-hoc networks with moving nodes. [8]

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**Set No.4**

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**MOBILE COMPUTING**

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**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions  
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1. a) Explain about the architecture of mobile computing. [8]  
b) Elucidate in detail about the radio interface and protocols of GSM System architecture. [8]
2. a) Discuss in detail about Time Division Multiple Access TDMA. [8]  
b) Explain in detail about spread Aloha multiple access (SAMA). [8]
3. a) Describe in detail about agent discovery and registration. [8]  
b) Discuss in detail about generic routing encapsulation in mobile IP. [8]
4. a) Explain about Transmission/time-out freezing approaches in mobile TCP. [8]  
b) Show the interaction of mobile IP with standard TCP. Draw the packet flow from a fixed host to a mobile host via a foreign agent. Then a handover takes place. What are the following actions of mobile IP and how does TCP react? [8]
5. a) Explain in detail different cache invalidation mechanisms. [8]  
b) Discuss about query processing in mobile networks. [8]
6. a) Describe in detail about push based data dissemination mechanism and focus on its advantages and disadvantages. [8]  
b) Explain in detail about hybrid based mechanism and discuss its significance. [8]
7. a) What is Mobile AdHoc network? Explain its properties and limitations. [8]  
b) Explain about ad-hoc on-demand distance vector protocol in detail. [8]
8. a) Explain in detail about the protocol architecture of wireless application protocol. [8]  
b) Discuss about the MAC layer in Bluetooth. [8]

Code No. N0221

**R07**

**Set No. 1**

**IV B.Tech I Semester Supplementary Examinations, February/March, 2012**  
**NEURAL NETWORKS AND FUZZY LOGIC**  
**(Common to Electrical & Electronics Engineering, Instrumentation & Control Engineering**  
**and Aeronautical Engineering)**

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. a) Describe in detail about biological and artificial neuron models.  
b) Compare different neuron models and summarize them. [8+8]
  
2. a) Elucidate in detail about the different architectural styles of artificial neural networks  
b) Explain about Activation and synaptic neural dynamics in detail. [8+8]
  
3. a) Discuss about discrete and continuous perceptron models.  
b) Give a detailed notes on single layer feed forward neural networks. [8+8]
  
4. a) What is the significance of generalized delta rule? Explain in detail.  
b) What is back propagation? Derive its learning algorithm with a schematic two layer feed forward neural network. [8+8]
  
5. a) Discuss different paradigms of associative memory.  
b) Explain how linear associator networks could not suppress cross terms due to noise. [8+8]

6. a)  $X = \{x_1, x_2, x_3\}$   $Y = \{y_1, y_2\}$   $Z = \{z_1, z_2, z_3\}$  Let  $\tilde{R}$  be a fuzzy relation
- $$\begin{bmatrix} 0.5 & 0.1 \\ 0.2 & 0.9 \\ 0.8 & 0.6 \end{bmatrix}$$

where X represents rows, Y represents columns. Let  $\tilde{S}$  be the fuzzy relation

$$\begin{bmatrix} 0.6 & 0.4 & 0.7 \\ 0.5 & 0.8 & 0.9 \end{bmatrix}$$

where Y represents rows, Z represents columns. Find  $\mathbf{R} \circ \mathbf{S}$  by max-min composition.

- b) Write the mathematical expression of the membership function and sketch of the membership function.

[8+8]

7. a) Given

(i)  $C \vee D$

(ii)  $\neg H \Rightarrow (A \wedge \neg B)$

(iii)  $(C \vee D) \Rightarrow \neg H$

(iv)  $(A \wedge \neg B) \Rightarrow (R \vee S)$

(v) Can  $(R \vee S)$  be inferred from the above?

- b) If an item has partial membership in several sets, would all membership values add up to unity?

[8+8]

8. Explain the application of ANNs for the following

a) Load forecasting

b) Process identification

[8+8]

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**Set No. 2**

IV B.Tech I Semester Supplementary Examinations, February/March, 2012

**NEURAL NETWORKS AND FUZZY LOGIC**

(Common to Electrical & Electronics Engineering, Instrumentation & Control Engineering  
and Aeronautical Engineering)

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

1. a) Describe in detail about the organization of human brain.  
b) Explain about the following neuron models  
i) Mc-Culloch Pitts model                      ii) Spiking neuron model                      [8+8]
2. a) Explain about the taxonomy of artificial neural networks.  
b) Describe about the operations of artificial neuron in detail.                      [8+8]
3. a) State perceptron convergence theorem in detail.  
b) Give in detail applications of feed forward single layer neural network.                      [8+8]
4. a) Derive and explain back propagation training algorithm.  
b) Explain the modifications suggested to back propagation network.                      [8+8]
5. a) Explain about linear associator and matrix memories in detail.  
b) Explain in detail about architectures of discrete and continuous versions of Hopfield networks.                      [8+8]
6. a) Explain in detail about membership functions in fuzzy logic with an example.  
b) The task is to recognize English alphabetical characters (F,E,X,Y,I,T) in an image processing system. Define two fuzzy sets  $\tilde{I}$  and  $\tilde{F}$  to represent the identification of characters I and F.  
$$\tilde{I} = \{(F,0.4),(E,0.3),(X,0.1),(Y,0.1),(I,0.9),(T,0.8)\}$$
$$\tilde{F} = \{(F,0.99),(E,0.8),(X,0.1),(Y,0.2),(I,0.5),(T,0.5)\}$$
Find the following.  
(i)  $\tilde{I} \cup \tilde{F}$                       (ii)  $(\tilde{I} - \tilde{F})$                       (iii)  $\tilde{F} \cup \tilde{F}^c$                       [8+8]
7. a) What is meant by defuzzification? Discuss few widely used methods of defuzzification.  
b) Discuss about fuzzy rule base for the air conditioner control in detail.                      [8+8]
8. a) Briefly discuss about the applications of neural networks.  
b) Explain briefly about the process identification with reference to the feed forward and plant inverse identification.                      [8+8]

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**Set No. 3**

IV B.Tech I Semester Supplementary Examinations, February/March, 2012

**NEURAL NETWORKS AND FUZZY LOGIC**

(Common to Electrical & Electronics Engineering, Instrumentation & Control Engineering  
and Aeronautical Engineering)

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

1. a) Discuss in detail about Spiking neuron model.  
b) Explain in detail about the organization of human brain. [8+8]
2. a) Explain different learning strategies of artificial neural networks.  
b) Give classification of some NN systems with respect to learning methods and architectural styles. [8+8]
3. a) Discuss in detail about Rosenblatt perceptron model. Explain about linearly separable and nonlinearly separable patterns.  
b) Discuss in detail about limitations of perceptron model. [8+8]
4. a) Give and explain about the architecture and algorithm of back propagation network.  
b) Which criteria is followed to decide the number of neurons in back propagation network [8+8]
5. a) Explain in detail about the energy analysis of discrete Hopfield networks.  
b) Describe in detail about bidirectional associative memory architecture with a block diagram. [8+8]
6. a) The task is to recognize English alphabetical characters (F,E,X,Y,I,T) in an image processing system. Define two fuzzy sets  $\tilde{I}$  and  $\tilde{F}$  to represent the identification of characters I and F.  
$$\tilde{I} = \{(F,0.4),(E,0.3),(X,0.1),(Y,0.1),(I,0.9),(T,0.8)\}$$
$$\tilde{F} = \{(F,0.99),(E,0.8),(X,0.1),(Y,0.2),(I,0.5),(T,0.5)\}$$
Find the Verify De-Morgan's Law,  $(\tilde{I} \cup \tilde{F})^c = \tilde{I}^c \cap \tilde{F}^c$   
b) Describe in detail about the cardinalities and relative cardinalities in fuzzy sets. [8+8]
7. a) Describe in detail about fuzzy logic system components.  
b) Discuss in detail about the maxima method with an example. [8+8]
8. a) Mention the applications of fuzzy logic in ovens.  
b) Design and develop a pressure process control by FLC model. Formulate necessary Membership functions and required fuzzy rules for the application. [8+8]

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**Set No. 4**

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**NEURAL NETWORKS AND FUZZY LOGIC**  
**(Common to Electrical & Electronics Engineering, Instrumentation & Control Engineering**  
**and Aeronautical Engineering**

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. a) Describe in detail about the characteristics of artificial neural networks.  
b) Explain in detail about Hodgkin-Huxley neuron model. [8+8]
  
2. a) What is the significance of activation function in learning of artificial neural networks and discuss different types of activation functions .  
b) Briefly explain about recurrent networks and give its architectural diagram. [8+8]
  
3. a) Give an algorithm for fixed increment perceptron learning algorithm for a classification problem with  $n$  input features ( $x_1, x_2, \dots, x_n$ ) and two output classes (0/1).  
b) Discuss in detail about training algorithms of continuous perceptron networks. [8+8]
  
4. a) Give suggestions to improve and modify back propagation network.  
b) Prove that for  $n=2$ , the number of hidden layer neurons  $j$  needed for hyper plane partition into  $M$  regions is  $j = 1/2 [(8M-7)^{1/2} - 1]$  [8+8]
  
5. a) Give the architecture of Hopfield network for discrete and continuous versions.  
b) Discuss in detail about hebbian learning and give equations for training the hebbian network. [8+8]

6. a) Discuss in detail about basic fuzzy set operations. Find the Concentration (CON) and Dilation (DIL) of the following:

$$\tilde{A} = \{(x_1, 0.4), (x_2, 0.2), (x_3, 0.7)\} \text{ and } \alpha = 2$$

- b) Consider a set  $P = \{P_1, P_2, P_3, P_4\}$  of four variables of paddy plants, set  $D = \{D_1, D_2, D_3, D_4\}$  of various diseases affecting the plants and  $S = \{S_1, S_2, S_3, S_4\}$  be the common symptom of diseases. Let  $\tilde{R}$  be the relation on  $P \times D$  and  $\tilde{S}$  be the relation on  $D \times S$ .

$$\tilde{R} = \begin{bmatrix} 0.6 & 0.6 & 0.9 & 0.8 \\ 0.1 & 0.2 & 0.9 & 0.8 \\ 0.9 & 0.3 & 0.4 & 0.8 \\ 0.9 & 0.8 & 0.1 & 0.2 \end{bmatrix} \quad \text{and} \quad \tilde{S} = \begin{bmatrix} 0.1 & 0.2 & 0.7 & 0.9 \\ 1 & 1 & 0.4 & 0.6 \\ 0 & 0 & 0.5 & 0.9 \\ 0.9 & 1 & 0.8 & 0.2 \end{bmatrix}$$

Obtain the association of plants with the different symptoms of the diseases using max-min composition.

[8+8]

7. a) Choose three fuzzy sets and illustrate the aggregation of the fuzzy sets.  
 b) Given (i) Every soldier is strong-willed.  
 (ii) All who are strong-willed and sincere will succeed in their career.  
 (iii) Indira is a soldier.  
 (iv) Indira is sincere.

Prove whether Indira will succeed in her career or not?

[8+8]

8. Describe in detail about process identification and control in neural network applications.

[16]

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**R07**

**Set No.1**

**IV B.Tech I Semester Supplementary Examinations, February/March, 2012**  
**ELECTRONIC MEASUREMENTS & INSTRUMENTATION**  
**(Electronics and Communication Engineering)**

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. a) Explain the terms accuracy, precision and resolution as used for indicating instruments.  
b) Two resistors have the following ratings:  $R_1 = 200 \Omega \pm 10\%$  and  $R_2 = 500 \Omega \pm 5\%$ . calculate
  - i) the magnitude of error in each resistor
  - ii) the limiting error in ohms when the resistors are connected in series;
  - iii) the limiting error in ohms when the resistors are connected in parallel.
  
2. a) Explain the important specifications for sine/square wave generators and Function generators.  
b) Draw a simple circuit for frequency modulating an RF signal generator and explain its operation.
  
3. a) With a neat sketch explain the operation of a fundamental suppression harmonic distortion analyzer  
b) Explain the important applications of a spectrum analyzer.
  
4. a) Explain blanking and unblanking in an oscilloscope, and discuss the need for blanking.  
b) Sketch the construction of a dual-trace oscilloscope and explain its operation.
  
5. a) Describe briefly about various probes used in CROs  
b) Explain how the frequency is measured using a frequency counters.
  
6. a) A balanced ac bridge has the following constants.  
Arm AB-  $R = 1K\Omega$  in parallel with  $C = 0.047 \mu F$   
Arm BC-  $R = 2k\Omega$  in series with  $C = 0.047 \mu F$   
Arm CD- unknown  
Arm DA-  $C = 0.25 \mu F$   
The frequency of the oscillator is 1000Hz. Determine the constants of arm CD.  
b) Explain the principle and working of a Q-meter

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**R07**

**Set No.1**

7. a) With a neat diagram explain the operation of a LVDT  
b) Explain the principle of operation of a i) Thermocouple and ii) RTD.
  
8. a) Explain briefly about various pressure sensing elements.  
b) Explain how a strain gauge can be used to measure the pressure.

Code No. M0421

**R07**

**Set No.2**

**IV B.Tech I Semester Supplementary Examinations, February/March, 2012**  
**ELECTRONIC MEASUREMENTS & INSTRUMENTATION**  
**(Electronics and Communication Engineering)**

**Time: 3 hours**

**Max. Marks: 80**

**Answer any FIVE Questions**  
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\*\*\*\*\*

1. a) What are the effects of using a voltmeter of low sensitivity? Explain with an example.  
b) A PMMC instrument with a full scale deflection of  $50 \mu\text{A}$  and an internal resistance of  $100 \Omega$  is available. It is to be converted into a 0-5V, 0-10V, 0-50V, and 0-500V multi range voltmeter using series-connected resistors. Calculate the values of the multiplier resistors.
2. a) With a block diagram explain the working of a function generator producing sine, square and triangle waveforms.  
b) Sketch the circuit and explain with waveforms an op-amp a stable multi vibrator for use as a square-wave generator.
3. a) Explain with the help of block diagram the operation of a Spectrum Analyzer  
b) Explain the following terms associated with Spectrum Analyzer:
  - i). Sensitivity
  - ii). Dynamic Range
  - iii). Harmonic Mixing
4. a) Draw the block diagram of a basic CRO and explain each and every block.  
b) Describe the procedure of frequency and time period measurement using Lissajous figures.
5. a) With a block diagram explain the operation of a sampling oscilloscope.  
b) Explain the sources of errors and their minimizing methods in frequency counters
6. a) What are the limitations of a Wheatstone bridge circuit?  
b) Draw the circuit diagram of Anderson's bridge, explain its operation and derive the equations for unknown variables.

**Code No. M0421**

**R07**

**Set No.2**

7. a) Define gauge factor of a strain gauge and derive the expression for it.  
b) Describe the operation of a piezo-electric transducer.
  
8. a) Explain the working principle of a capacitive pressure transducer.  
b) Explain how an LVDT can be used to measure the pressure.

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**R07**

**Set No.3**

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**(Electronics and Communication Engineering)**

**Time: 3 hours**

**Max. Marks: 80**

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1. a) Explain the terms accuracy, precision and resolution as used for indicating instruments.  
b) Two resistors have the following ratings:  $R_1 = 100 \Omega \pm 5\%$  and  $R_2 = 200 \Omega \pm 5\%$ . calculate
  - i) the magnitude of error in each resistor
  - ii) the limiting error in ohms when the resistors are connected in series;
  - iii) the limiting error in ohms when the resistors are connected in parallel.
2. a) Explain the important specifications for sine/square wave generators and Function generators.  
b) Draw a simple circuit for frequency modulating an RF signal generator and explain its operation.
3. a) With a neat sketch explain the operation of a fundamental suppression harmonic distortion analyzer  
b) Explain the important applications of a spectrum analyzer.
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b) Sketch the construction of a dual-beam oscilloscope and explain its operation.
5. a) With a block diagram explain the operation of a sampling oscilloscope.  
b) Explain the sources of errors and their minimizing methods in frequency counters.
6. a) What are the limitations of a Wheatstone bridge circuit?  
b) Draw the circuit diagram of Maxwell's bridge, explain its operation and derive the equations for unknown variables.

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**R07**

**Set No.3**

7. a) Define gauge factor of a strain gauge and derive the expression for it.  
b) Describe the operation of a piezo-electric transducer
  
8. a) Explain the working principle of a capacitive pressure transducer.  
b) Explain how an LVDT can be used to measure the pressure

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**Set No.4**

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**(Electronics and Communication Engineering)**

**Time: 3 hours**

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b) A PMMC instrument with a full scale deflection of  $100\ \mu\text{A}$  and an internal resistance of  $200\ \Omega$  is available. It is to be converted into a 0-5V, 0-10V, 0-50V, and 0-100V multi range voltmeter using series-connected resistors. Calculate the values of the multiplier resistors.
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b) Sketch the circuit and explain with waveforms an op-amp a stable multi vibrator for use as a square-wave generator.
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b) Explain the following terms associated with Spectrum Analyzer:
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b) Describe the procedure of frequency and phase difference measurement using Lissajous figures.
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b) Explain how the frequency is measured using a frequency counters.

6. a) A balanced ac bridge has the following constants.  
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Arm BC-  $R = 4\text{k}\Omega$  in series with  $C = 0.047 \mu\text{F}$   
Arm CD- unknown  
Arm DA-  $C = 0.25 \mu\text{F}$   
The frequency of the oscillator is 2000Hz. Determine the constants of arm CD.  
b) Explain the principle and working of a Q-meter.
7. a) With a neat diagram, explain the operation of a LVDT.  
b) Explain the principle of operation of a i) Thermocouple and ii) RTD.
8. a) Explain briefly about various pressure sensing elements.  
b) Explain how a strain gauge can be used to measure the pressure.