

SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING QUESTION BANK



III SEMESTER

EI3362 ELECTRICAL AND ELECTRONIC INSTRUMENTS

Regulation – 2023

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Prepared by

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DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING QUESTION BANK



SUBJECT : EI3362 - ELECTRICAL AND ELECTRONIC INSTRUMENTS
SEM / YEAR : III / II

UNIT I				
ELECTRICAL MEASUREMENTS				
<i>General features and Classification of electro mechanical instruments. Principles of Moving coil, moving iron, dynamometer type, rectifier type, thermal instruments. Extension of instrument range: shunt and multipliers, Current transformers and Potential transformers.</i>				
PART – A				
Q. No	Questions	CO LEVEL	BTL	Competence
1.	List some of the electromechanical instruments.	CO 01	BTL2	Understand
2.	Define electromechanical instruments.	CO 01	BTL2	Understand
3.	Name some of the parts of moving coil instruments.	CO 01	BTL1	Remember
4.	Distinguish moving coil and moving iron instruments.	CO 01	BTL1	Remember
5.	What are the forces present in electromechanical mechanism?	CO 01	BTL2	Understand
6.	How do you infer the term deflecting torque?	CO 01	BTL2	Understand
7.	A permanent magnet moving coil instrument has a coil of dimensions 15mm X 12 mm. the flux density in the air gap is $1.8 \times 10^{-3} \text{ Wb/m}^2$ and the spring constant is $0.14 \times 10^{-6} \text{ Nm/rad}$. Determine the number of turns required to produce an angular deflection of 90 degrees when a current of 5 mA is flowing through the coil.	CO 01	BTL2	Understand
8.	List the advantages and disadvantages of PMMC instruments.	CO 01	BTL1	Remember
9.	Identify the main sources of errors in PMMC instruments.	CO 01	BTL1	Remember
10.	Mention the advantages and disadvantages of moving iron instruments.	CO 01	BTL1	Remember
11.	Why electromechanical instruments are called deflecting type instruments?	CO 01	BTL2	Understand
12.	Is it possible to measure DC and AC using permanent magnet moving coil type instrument? Convince.	CO 01	BTL2	Understand
13.	Compare spring control and gravity control.	CO 01	BTL2	Understand
14.	Differentiate between current coil and pressure coil of electro dynamometer wattmeter.	CO 01	BTL2	Understand
15.	Find the multiplying power of a shunt of 200 ohm resistance used with a galvanometer of 1000 ohm resistance. Determine the value of shunt resistance to give a multiplying power of 50.	CO 01	BTL2	Understand

16.	A thermos electric ammeter is assumed to have a perfect square law response. It gives a full scale deflection for a current of 10 A. Calculate the current which causes half scale deflection.	CO 01	BTL2	Understand
17.	State the principle of electro-dynamometer.	CO 01	BTL2	Understand
18.	What are the types of control system and damping system are used in dynamometer instrument?	CO 01	BTL2	Understand
19.	Write down the deflecting torque equation in dynamometer type wattmeter.	CO 01	BTL1	Remember
20.	What is meant by transformation ratio in instrument transformers?	CO 01	BTL1	Remember
21.	How to extend the range of voltmeters?	CO 01	BTL1	Remember
22.	What are the requirements of materials used in making shunts for extending range of instruments?	CO 01	BTL1	Remember
23.	What are the methods adopted for the testing of potential transformers?	CO 01	BTL1	Remember
24.	How the errors in current transformers can be reduced? What are the means to reduce error in CT?	CO 01	BTL1	Remember

PART – B

PART – B				
1.	List the various types of errors in electro-dynamometer instruments. Explain them in detail. (16)	CO 01	BTL3	Apply
2.	(i) Explain the various types of errors encountered in PMMC instruments. (8) (ii) Enumerate the advantages and disadvantages of PMMC instruments. (8)	CO 01	BTL4	Analyze
3.	(i) Explain the various characteristics of current transformer. (8) (ii) Explain the advantages in using Instrument transformers for range extension. (8)	CO 01	BTL4	Analyze
4.	Briefly explain the different ratios of instrument transformers. (16)	CO 01	BTL3	Apply
5.	Explain the construction of current transformer and potential transformer. (16)	CO 01	BTL3	Apply
6.	Describe with neat diagram the construction and working principle of attraction and repulsion type MI instruments. (16)	CO 01	BTL3	Apply
7.	Develop the torque equation for a PMMC instrument. Show that its scale is linear if spring control is employed and list out the advantages. (16)	CO 01	BTL3	Apply
8.	Describe in detail with neat illustration, the construction, working principle of moving coil meters. (16)	CO 01	BTL4	Analyze
9.	Illustrate how MI instruments can be used for both AC and DC measurement using construction diagram with different vane arrangements. Justify why MI instruments cannot be accurate for DC measurement. (16)	CO 01	BTL4	Analyze

10.	The coil of a 600V M.I meter has an inductance of 1 Henry. It gives correct reading at 50HZ and requires 100mA. For its full-scale deflection, what is % error in the meter when connected to 200V D.C. by comparing with 200V A.C? (16)	CO 01	BTL4	Analyze
11.	Explain the operation of dynamometer type ammeter with torque equation. (16)	CO 01	BTL4	Analyze
12.	With neat sketch and phasor diagram discuss the construction and operation of induction type single phase energy meter. (16)	CO 01	BTL3	Apply
13.	A moving coil instrument gives a full-scale deflection of 10mA when the potential difference across its terminals is 100 mV. Calculate: (i) Shunt resistance for a full-scale deflection corresponding to 100 A. (8) (ii) Series resistance for full scale reading with 1000 V. (8)	CO 01	BTL3	Apply
14.	With a neat sketch describe the construction and working principle of dynamometer type wattmeter. Develop its torque equation. (16)	CO 01	BTL4	Analyze
15.	Describe the construction and working of attraction type MI instrument. (16)	CO 01	BTL4	Analyze
16.	A moving coil instrument has a resistance of 10 ohm and gives a full scale deflection When carrying 50mA. Show how it can be adopted to measure voltage upto 750 V and current of 100 A. (16)	CO 01	BTL4	Analyze
17.	A moving coil galvanometer gives a deflection of 150 mm on a scale distance 2.5 m for a current of 2.5 micro amps. The resistance of the moving coil of galvanometer is 250 ohm. Evaluate (i) Current Sensitivity (ii) Voltage Sensitivity (iii) Mega ohm sensitivity (iv) the deflection produced in radians by a current of 5 micro amps. (16)	CO 01	BTL3	Apply

UNIT II

MEASUREMENT OF POWER

Electrodynamic wattmeter's, Low Power Factor (LPF) wattmeter, errors, calibration of wattmeter. Single and three phase power measurement, Hall effect wattmeter, thermal type wattmeter.

PART – A

Q. No	Questions	CO LEVEL	BTL	Competence
1.	How the power can be measured using a voltmeter and ammeter?	CO 02	BTL2	Understand
2.	Draw the circuit diagram of one wattmeter method.	CO 02	BTL1	Remember
3.	Determine how the pressure coil capacitance error occurs in Electrodynamic wattmeter.	CO 02	BTL2	Understand
4.	What is the purpose of field coils present in electrodynamic wattmeter.	CO 02	BTL1	Remember

5.	Illustrate the type of damping used in electro-dynamometer wattmeter.	CO 02	BTL1	Remember
6.	List the different ways of calibrating D.C wattmeter.	CO 02	BTL2	Understand
7.	Enumerate the purpose of correction factor in electro-dynamometer wattmeter.	CO 02	BTL1	Remember
8.	Derive the equation for true power in electro-dynamometer type instrument.	CO 02	BTL1	Remember
9.	State the hall effect principle.	CO 02	BTL2	Understand
10.	Derive the error formula in electro dynamometer wattmeter in terms of true power.	CO 02	BTL1	Remember
11.	Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of circuit when both the readings are positive.	CO 02	BTL1	Remember
12.	Draw the phasor diagram of thermal watt-converter.	CO 02	BTL1	Remember
13.	Define power.	CO 02	BTL1	Remember
14.	State the principle of thermocouple effect.	CO 02	BTL1	Remember
15.	Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of circuit when the latter reading is obtained after reversing the connections to the current coil of first instrument.	CO 02	BTL2	Understand
16.	Draw the wattmeter connection circuit with PC on load side.	CO 02	BTL2	Understand
17.	A 3 phase 500 V motor load has a power factor of 0.4. Two wattmeters connected to measure the input. They show the input to be 30 kW. Find the reading of each instrument.	CO 02	BTL2	Understand
18.	List the calibration methods of AC Wattmeter.	CO 02	BTL1	Remember
19.	State the pressure coil of electro-dynamometer wattmeter.	CO 02	BTL1	Remember
20.	What is phantom loading?	CO 02	BTL1	Remember
21.	Derive the power factor expression of one wattmeter method.	CO 02	BTL2	Understand
22.	Elist the different ways of calibrating a A.C wattmeter.	CO 02	BTL2	Understand
23.	What is the major advantage of using Hall effect multiplier over electro-dynamometer wattmeter.	CO 02	BTL2	Understand
24.	Draw the shape of scale of electro-dynamometer wattmeter showing the variation of mutual inductance with deflection.	CO 02	BTL2	Understand

PART –B

1.	Describe with neat diagram the construction and working principle of Hall effect wattmeter and thermal type wattmeter. (16)	CO 02	BTL3	Apply
2.	Explain the construction and torque equation of an electro-dynamometer wattmeter. (16)	CO 02	BTL3	Apply
3.	List the errors occurring in electro-dynamometer wattmeter and explain how they are compensated. (16)	CO 02	BTL3	Apply
4.	A wattmeter has a c.c of 0.1 ohm resistance and p.c of 6500 ohm	CO 02	BTL3	Apply

	resistance. Calculate the % error due to resistance only (a) when the pc is connected on supply side and (b) when the pc is connected on load side. (16)			
5.	Specify in detail the various arrangements of Ammeter and Voltmeter for the measurement of power. (16)	CO 02	BTL3	Apply
6.	Enumerate the adjustments to be made in electrodynamic meter for the measurement of low power factor. (16)	CO 02	BTL3	Apply
7.	With a neat diagram explain the construction and working principle of Ferro dynamic wattmeter. (16)	CO 02	BTL3	Apply
8.	Explain the measurement of power in Poly phase systems using Blondel's theorem. (16)	CO 02	BTL3	Apply
9.	Discuss various methods of calibration of a wattmeter. (16)	CO 02	BTL3	Apply
10.	With a suitable experimental setup explain how the power can be measured using a Hall effect principle? (16)		BTL4	Analyze
11.	With the help of Instrument transformers explain how power is being measured? Explain with suitable diagram. (16)	CO 02	BTL4	Analyze
12.	Draw the circuit of Thermal watt converter and write a detailed description about the various components employed in it. (16)	CO 02	BTL4	Analyze
13.	Give a brief note about three wattmeter method of power measurement using a suitable circuit. (16)	CO 02	BTL4	Analyze
14.	Explain the different type of connections involved in the Two wattmeter method of power measurement. (16)	CO 02	BTL4	Analyze
15.	Analyze the working principle of Three phase Wattmeter with a suitable circuit diagram. (16)	CO 02	BTL4	Analyze
16.	Explain the measurement of power in AC circuits and DC circuits. (16)	CO 02	BTL4	Analyze
17.	A dynamometer type wattmeter with its voltage coil connected across the load reads 250 W. if the load voltage is 200 V, what power is taken by the load. The resistance of the voltage coil is 2000 Ω . (16)	CO 02	BTL4	Analyze

UNIT III

MEASUREMENT OF RESISTANCE, INDUCTANCE AND CAPACITANCE

Low, high and precise resistance measurement, Megger, Ohmmeters, Classical AC bridges: Inductance and capacitance measurements. Detectors in bridge measurement, Wagner earth, transformer ratio bridges

PART – A

Q. No	Questions	CO LEVEL	BTL	Competence
1.	List the difficulties in high resistance measurement and method to overcome them.	CO 03	BTL1	Remember
2.	Mention the limitations of Wheatstone bridge.	CO 03	BTL1	Remember
3.	Infer the expression for unknown resistance connected in Wheat stone bridge.	CO 03	BTL1	Remember
4.	Compare and contrast Kelvin's double bridge from Kelvin Bridge.	CO 03	BTL1	Remember
5.	State the types of bridges involved in low resistance measurement.	CO 03	BTL1	Remember
6.	Estimate the range of resistance which a Kelvin's double bridge can measure accurately.	CO 03	BTL1	Remember

7.	Show the necessity for a shunt resistor in a series type ohmmeter.	CO 03	BTL1	Remember
8.	How resistance is measured by using ohm meter method?	CO 03	BTL1	Remember
9.	What is the purpose of instrument transformers?	CO 03	BTL2	Understand
10.	Draw a suitable circuit for the measurement of medium resistance.	CO 03	BTL2	Understand
11.	What are the sources of errors in bridge circuit?	CO 03	BTL2	Understand
12.	In Maxwell's capacitance bridge for calculating unknown inductance, the various values at balance are, $R_1 = 300 \Omega$, $R_2 = 700 \Omega$, $R_3 = 1500 \Omega$, $C_4 = 0.8 \mu\text{F}$. Calculate R_1 , L_1 and Q factor, if the frequency is 1100 Hz.	CO 03	BTL2	Understand
13.	Which type of detector is used in AC bridges?	CO 03	BTL2	Understand
14.	What are the sources of errors in AC bridge measurement?	CO 03	BTL1	Remember
15.	Why there are two conditions of balance in ac bridges, where as there is only one for dc bridges?	CO 03	BTL2	Understand
16.	Draw a suitable AC bridge used for measurement of frequency.	CO 03	BTL1	Remember
17.	Why Maxwell Bridge is limited to the measurement of medium – Q coils?	CO 03	BTL2	Understand
18.	State the balance equation used in bridge methods.	CO 03	BTL1	Remember
19.	Differentiate low, medium and high resistances in terms of its range.	CO 03	BTL2	Understand
20.	A resistance of approximately 3000Ω is needed to balance a bridge. It is obtained on a 5 dial resistance box having steps of 1000, 100, 10, 1 and 0.1Ω . The measurement is to be guaranteed to 0.1 %. For this accuracy, how many of these dials would it be worth adjusting.	CO 03	BTL2	Understand
21.	Enumerate the purpose of Carey Foster Slide Wire bridge circuit.	CO 03	BTL2	Understand
22.	Name the ac sources used in ac bridges.	CO 03	BTL2	Understand
23.	Confess the usage of kelvin Varley slide.	CO 03	BTL2	Understand
24.	Enlist the major factors on which the resistance of any earthing system depends.	CO 03	BTL2	Understand

PART-B

1.	(i) List the difficulties in the measurement of high resistance. (8) (ii) Examine the direct deflection method for measurement of high resistance. (8)	CO 03	BTL4	Analyze
2.	With neat sketch, explain the measurement of high resistance using loss of Charge method. (16)	CO 03	BTL4	Analyze

3.	Analyze about the ammeter-voltmeter method of measurement of resistance. (16)	CO 03	BTL4	Analyze
4.	Describe the basic circuit construction and operation of Crompton laboratory type D.C potentiometer. (16)	CO 03	BTL4	Analyze
5.	A shunt type ohmmeter has a D'Arsonval movement of resistance 2Ω . Its full-scale deflection current is 10mA, and the battery voltage is 3 volts. Calculate the value of current limiting resistor so that the meter indicates 0.5Ω at the midpoint of its scale. (16)	CO 03	BTL4	Analyze
6.	Explain the principle, construction and working of shunt type ohmmeter. (16)	CO 03	BTL4	Analyze
7.	List the different types of ratios present in instrument transformers and write how it is calculated. (16)	CO 03	BTL3	Apply
8.	Explain about the measurement of low resistance using the wheat stone bridge with necessary illustrations and expressions. (16)	CO 03	BTL4	Analyze
9.	Discuss the measurement of resistance using Kelvin double bridge method and obtain expression for unknown resistance. (16)	CO 03	BTL3	Apply
10.	(i) Derive the bridge balance condition for Hay's bridge with necessary illustrations. (8) (ii) Explain Wein bridge circuit for measurement of frequency (8)	CO 03	BTL3	Apply
11.	(i) Describe the working of Schering bridge for the measurement of capacitance with neat diagram. (8) (ii) Derive the equations for capacitance and dissipation factor. (8)	CO 03	BTL3	Apply
12.	Draw the circuit diagram of Maxwell's bridge and explain the measurement procedure for measuring unknown inductance using this bridge. Derive formula used. (16)	CO 03	BTL3	Apply
13.	Sketch the circuit diagram of Anderson's bridge. Derive the equations for resistive and inductive components of the inductor to be measured. (16)	CO 03	BTL3	Apply
14.	Explain the principle, construction and working of series type ohmmeter. (16)	CO 03	BTL3	Apply
15.	(i) Derive the equation of balance for Anderson bridge and also draw the phasor diagram. (8) (ii) An AC bridge is balanced at 2KHz with the following components in each arm: Arm AB= $10K\Omega$, Arm BC= $100\mu F$ in series with $100K\Omega$, Arm AD= $50K\Omega$. Find the unknown impedance $R \pm jX$ in the arm DC, if the detector is between BD. (8)	CO 03	BTL3	Apply
16.	Explain the sensitivity of Wheatstone bridge circuit and derive the equation for bridge sensitivity. (16)	CO 03	BTL3	Apply
17.	In the circuit of series type ohmmeter, a 1mA meter movement with an internal of 50Ω is to be used. The battery voltage is 3V. Half-scale deflection should be for 2500Ω (i) Calculate the values of R1 and R2 (ii) Find the change in the value of R2 if the battery voltage reduces by 10%. (iii) What is the half-scale deflection if battery voltage reduces by 10%? (16)	CO 03	BTL3	Apply

UNIT IV

ELECTRONIC AND DIGITAL MEASUREMENTS

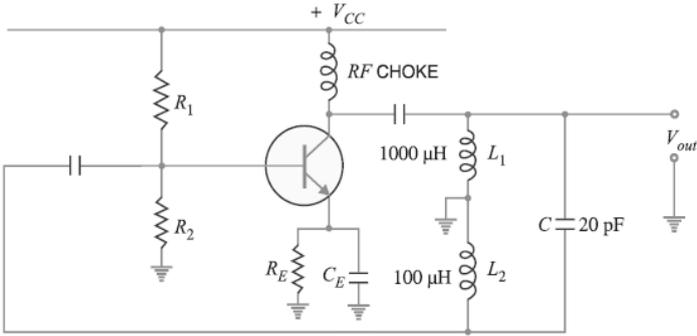
Electronic voltmeter, current measurement with electronic instruments, Digital voltmeter, Analog and digital multi-meters, Digital frequency meters. Digital LCR meter, Q-Meter, Digital wattmeter and energy meters. Wave analyzers, Logic analyser, spectrum analyser – signal and function generators.

PART – A

Q. No	Questions	CO LEVEL	BTL	Competence
1.	What is the function dual trace oscilloscope in X-Y mode?	CO 04	BTL2	Understand
2.	State the modes of operation in the block of dual trace oscilloscope.	CO 04	BTL2	Understand
3.	Which electrical quantity cannot be directly measured by using multimeter?	CO 04	BTL1	Remember
4.	List the merits of electronic voltmeter	CO 04	BTL2	Understand
5.	How power can be measured using electronic multimeter?	CO 04	BTL2	Understand
6.	Generalize the methods of digital measurement of frequency.	CO 04	BTL1	Remember
7.	Draw the basic circuit of a digital frequency meter.	CO 04	BTL2	Understand
8.	Generalise the applications of Q meter.	CO 04	BTL2	Understand
9.	Analyze the automatic ranging in DMM.	CO 04	BTL2	Understand
10.	Define vacuum tube voltmeter.	CO 04	BTL1	Remember
11.	The self capacitance of a coil is measured by a Q meter. The circuit is set into resonance at 2 MHz and the tuning capacitor is as value of 460 pF. Calculate the percentage error introduced in the calculated value of Q if a resistance of 0.02 Ω is used across the oscillator circuit.	CO 04	BTL1	Remember
12.	Differentiate the functionality of a wave analyzer from a spectrum analyzer.	CO 04	BTL1	Remember
13.	List the frequency range of different types of signal analyzer.	CO 04	BTL1	Remember
14.	In a source follower type electronic voltmeter, the trans conductance of FET is 0.05 mho and the resistance of the meter is 100 Ω . Find the value of current through the meter when the input voltage is 1V.	CO 04	BTL2	Understand
15.	Give the essential parts of a rectifier type electronic voltmeter.	CO 04	BTL2	Understand
16.	What are the general characteristics of digital voltmeter?	CO 04	BTL1	Remember
17.	List the advantages and disadvantages of an electronic multimeter.	CO 04	BTL1	Remember
18.	State the limitations of multirange electronic voltmeters.	CO 04	BTL1	Remember
19.	List the major components of electronic multimeters.	CO 04	BTL1	Remember
20.	State the advantages of using digital voltmeter.	CO 04	BTL1	Remember
21.	Enumerate the types of DVM.	CO 04	BTL1	Remember
22.	Define the term sensitivity of digital meters.	CO 04	BTL2	Understand
23.	A circuit consisting of a coil, a resistance and a variable capacitor connected in series is tuned to resonance using a Q meter. If the frequency is 500kHz, the resistance 0.5 Ω and the variable capacitor set to 350pF. Calculate the effective inductance and resistance of the coil, if the Q meter indicates 90.	CO 04	BTL2	Understand
24.	A coil of resistance 10 Ω is connected in the Q meter circuit.	CO 04	BTL2	Understand

	Resonance occurs at a frequency of 1MHz with the tuning capacitor set at 65pF. Calculate the percentage error introduced in the calculated value of Q if a resistance of 0.02 Ω is used across the oscillator circuit.			
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PART-B				
1.	With neat circuit diagram explain the operation of electronic type voltmeter. (16)	CO 04	BTL3	Apply
2.	Explain the principle operation of Vacuum tube voltmeter along with its types. (16)	CO 04	BTL3	Apply
3.	With the phasor diagram explain the average reading diode vacuum tube voltmeter. (16)	CO 04	BTL3	Apply
4.	Explain the operation of electronic multimeter with neat diagram. (16)	CO 04	BTL4	Analyze
5.	Explain in detail about various criteria to be considered in selecting an analog voltmeter. (16)	CO 04	BTL4	Analyze
6.	With a neat block diagram explain the operation of A.C differential voltmeter. (16)	CO 04	BTL4	Analyze
7.	Explain the construction and working principle of digital wattmeter (16)	CO 04	BTL4	Analyze
8.	State with a diagram the working principle of a digital frequency meter. (16)	CO 04	BTL4	Analyze
9.	Define waveform analyzer and explain in detail about frequency selective type wave analyzer with block diagram. (16)	CO 04	BTL4	Analyze
10.	(i) Label the parts and explain the working of a heterodyne type wave analyzer circuit. (10) (ii) List the applications of a Spectrum analyzer. (6)	CO 04	BTL4	Analyze
11.	Describe the circuits and working of wave analyzer used for audio frequency and megahertz range. (16)	CO 04	BTL3	Apply
12.	Explain the procedure of measurement of a harmonic distortion analyzer using a bridged-T Network. (16)	CO 04	BTL3	Apply
13.	Sketch and explain in detail about the Spectrum analyzer. (16)	CO 04	BTL3	Apply
14.	Describe briefly about: (i) Types of distortion. (6) (ii) Total harmonic distortion. (5) (iii) Harmonic distortion analyzer. (5)	CO 04	BTL3	Apply
15.	(i) Design a RC phase shift oscillator for frequency equal to 10kHz. (8) (ii) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with $L_1 = 58.6 \mu\text{H}$ and $C_1 = 300 \text{ pF}$. Calculate the frequency of oscillations. (8)	CO 04	BTL4	Analyze
16.	The meter constant of a single phase energy meter is 500 rev/kWh. The meter takes 86 seconds to make 50 revolutions while measuring a full load of 4.4kW. the percentage error in the meter is? (16)	CO 04	BTL3	Apply

17.	 <p>Calculate the (i) operating frequency (ii) Feedback fraction for Hartley oscillator shown in Fig. The mutual inductance between the coils, $M = 20 \mu\text{H}$. (16)</p>	CO 04	BTL4	Analyze
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UNIT V				
DISPLAY AND RECORDING INSTRUMENTS				
<i>DSO, MSO, Function generators, signal generators, waveform analyzers, spectrum analyzers, distortion analyzers, LED, LCD and Organic LED displays.</i>				
PART-A				
Q. No	Questions	CO LEVEL	BT Level	Competence
1.	Obtain the basic components of magnetic tape recorder.	CO 05	BTL1	Remember
2.	Write about the display devices.	CO 05	BTL1	Remember
3.	Identify the advantages and disadvantages of FM recording.	CO 05	BTL1	Remember
4.	Differentiate between FM recording modulations.	CO 05	BTL1	Remember
5.	Interpret the digital recording with neat sketch.	CO 05	BTL1	Remember
6.	Quote about the basic operating principle of digital tape recorder?	CO 05	BTL2	Understand
7.	Draw the block diagram for NRZ method recording.	CO 05	BTL2	Understand
8.	Mention the applications of X-Y recorder.	CO 05	BTL2	Understand
9.	Compare the Impact printers with Dot matrix printers.	CO 05	BTL2	Understand
10.	Define the deflection sensitivity of CRT.	CO 05	BTL2	Understand
11.	Construct the block diagram of digital CRO.	CO 05	BTL1	Remember
12.	Examine the purpose of horizontal amplifier.	CO 05	BTL1	Remember
13.	Infer the vertical deflection system in CRT.	CO 05	BTL1	Remember
14.	Explain the working of digital CRO.	CO 05	BTL2	Understand
15.	How the light is visible in LED?	CO 05	BTL1	Remember
16.	List the applications of LED.	CO 05	BTL1	Remember
17.	Classify the types of LCD's	CO 05	BTL1	Remember
18.	State the data loggers.	CO 05	BTL2	Understand
19.	Express the input signals fed to the input scanner of the data logger.	CO 05	BTL2	Understand
20.	Point out the benefits of dot matrix displays.	CO 05	BTL2	Understand
21.	What is an X-Y recorder?	CO 05	BTL2	Understand
22.	Distinguish between RZ and NRZ techniques of digital tape	CO 05	BTL2	Understand

	recording.			
23.	A tape receives 12000 nos. per second. The tape speed is 1.5m/sec. Determine the no. density of the tape.	CO 05	BTL2	Understand
24.	Distinguish between Single point and Multi point recorders.	CO 05	BTL2	Understand

PART-B

1.	Illustrate the working of Cathode ray oscilloscope with block diagram. (16)	CO 05	BTL3	Apply
2.	Describe the basic components of a magnetic tape recorder. (16)	CO 05	BTL4	Analyze
3.	Analyze the working of magnetic tape recorder using FM recording. (16)	CO 05	BTL4	Analyze
4.	Outline the operation of a Pulse duration modulation method. (16)	CO 05	BTL3	Apply
5.	Demonstrate the following in detail: (i) Return to zero method (8) Non-Return to zero method (8)	CO 05	BTL4	Analyze
6.	Write short notes on: (i) Digital plotters (8) Dot matrix printer (8)	CO 05	BTL4	Analyze
7.	Enumerate about the segmental LED display with necessary diagrams. (16)	CO 05	BTL4	Analyze
8.	Summarize the following: (i) Ink-jet printers (8) (ii) Laser printers. (8)	CO 05	BTL4	Analyze
9.	Categorize the screens for the CRTs and its effects. (16)	CO 05	BTL4	Analyze
10.	Explain the following applications of the oscilloscope: (i) Voltage measurement. (5) (ii) Current measurement. (5) (iii) Time and Frequency measurement. (6)	CO 05	BTL4	Analyze
11.	Outline the operation of: (i) Light emitting diode. (8) (ii) Liquid crystal display. (8)	CO 05	BTL3	Apply
12.	(i) Compare the LED and LCD. (8) (ii) Infer the operation of Dot matrix displays. (8)	CO 05	BTL3	Apply
13.	Explain the detailed operation of data loggers with its block diagram. (16)	CO 05	BTL3	Apply
14.	Define recorder. Write short notes on Strip chart recorder with its advantages and disadvantages. (16)	CO 05	BTL3	Apply
15.	Express the principle and working of Nixie Tubes. (16)	CO 05	BTL3	Apply
16.	Examine the FM method of magnetic tape recording and explain its benefits & disadvantages. (16)	CO 05	BTL3	Apply
17.	Discuss about the different methods used for Digital Tape recording. (16)	CO 05	BTL3	Apply