



GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, June – 2021

(Sixth Semester)

BELPC6020 / BEEPC6020 – ELECTRICAL AND ELETRONIC MEASUREMENTS

(Common to EE and EEE)

Time: 2 hrs

Maximum: 50 Marks

Answer ALL Questions**The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)****Q.1. Answer ALL questions****[CO#] [PO#]**

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| <p>a. An instrument in which the value of ethnical quantity to be measured can be determined from the deflection of the instrument when it has been pre calibrated by comparison with an absolute instrument</p> <p>(i)Absolute instrument (ii)Secondary instrument</p> <p>(iii)Recording instrument (iv)Integrating instrument</p> <p>b. An ammeter is convertible to a voltmeter by</p> <p>(i)Changing the scale (ii)Putting a large resistance in parallel with the actual measuring part of the instrument</p> <p>(iii)Putting a large resistance in series with the actual measuring part of the instrument</p> <p>c. In a single phase power factor meter the phase difference between the currents in the two pressure coils is</p> <p>(i)Exactly 0° (ii)Approximately 0°</p> <p>(iii)Exactly 90 (iv)Approximately 90</p> <p>d. For measurements on high voltage capacitors, the suitable bridge is</p> <p>(i)Wien bridge (ii)Modified De Santy's bridge</p> <p>(iii)Wheatstone bridge (iv)Schering Bridge</p> <p>e. In an Anderson bridge, the unknown inductance is measured in terms of</p> <p>(i)Known inductance and resistance (ii)Known capacitance and resistance</p> <p>(iii)Known resistance (iv)Known inductance</p> <p>f. Resistances can be measured with the help of</p> <p>(i)Watt-meters (ii)Voltmeters</p> <p>(iii)Ammeters (iv)Ohmmeters and resistance bridges</p> <p>g. A resistance of 75 Ohms is connected in shunt of a galvanometer, having an internal resistance of 25 Ohms, to convert it into an ammeter. What is the value of current (in A) flowing through the galvanometer, if the total current in the circuit is 5 A?</p> <p>(i)2 (ii)2.5</p> <p>(iii)3.65 (iv)3.75</p> <p>h. The disc of an instrument using eddy current damping should be of</p> <p>(i)Conducting and magnetic material (ii)Non-conducting and magnetic material</p> <p>(iii)Conducting and nonmagnetic material (iv)None of the above</p> <p>i. Which of the following is measured by using a vector voltmeter ?</p> | <p>CO1 PO1</p> <p>CO2 PO1</p> <p>CO2 PO2</p> <p>CO3 PO2</p> <p>CO3 PO1</p> <p>CO3 PO2</p> <p>CO2 PO1</p> <p>CO4 PO2</p> <p>CO5 PO1</p> |
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| (i) Amplifier gain and phase shift | (ii) Miller transfer functions | | |
| (iii) Complex insertion loss | (iv) All of the above | | |
| j. An instrument transformer is used to extend the range of | | CO5 | PO2 |
| (i) induction instrument | (ii) electrostatic instrument | | |
| (iii) moving coil instrument | (iv) any of the above | | |

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

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| a. The true value of a voltage is 100V. The values indicated by a measuring instrument are 104, 103, 105, 103 and 105 Volts. Find the accuracy and precision of the measurement. | CO2 | PO2 |
| b. Mention the basic requirements of measurement. | CO1 | PO1 |
| e. State the principle of D'Arsonval movement | CO5 | PO2 |
| g. State the advantages of Crompton potentiometer. | CO4 | PO2 |
| i. CRO has become an universal tool in all kinds of electrical and electronic investigation. Why ?. | CO6 | PO2 |

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

Answer ANY FIVE questions

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| 3. Describe the construction and working of permanent magnet moving coil instrument. Also derive the expression for deflection. | (6) | CO1 | PO1 |
| 4. Discuss the working principle of operation of Electrodynamometer type of instruments with its constructional diagram | (6) | CO2 | PO2 |
| 5. Explain how the inductance is measured in terms of known capacitance using Maxwell's bridge. Derive the conditions for balance. | (6) | CO3 | PO1 |
| 6. The bridge consists of 4 arms; AB has a resistance of 100 ohm in series with a capacitance 0.05 μ F. BC has a resistance of 1000 ohm; CD has a coil of 0.1 H, R= 100 ohm; DA has a variable resistance R3 in series with a capacitance of 0.5 μ F. (i) Find R3 for the closest approach bridge balance (ii) Is the bridge completely balanced by this adjustment of R3? If not, show where a decade resistance box can be added to improve the balance and compute the resistance setting needed for exact balance. | (6) | CO3 | PO2 |
| 7. Explain in detail the measurement of Flux and magnetic field by using Galvanometers | (6) | CO5 | PO2 |
| 8. Draw the sketch of modern slide wire DC potentiometer and describe how it standardized | (6) | CO4 | PO1 |
| 9. With the help of the fundamental block diagram, explain the working principle of digital storage oscilloscope, mention its advantages over analog CRO? | (6) | CO6 | PO1 |
| 10. Explain the term 'loading' in voltmeter and give the method to remove the adverse effect of the same. | (6) | CO5 | PO2 |

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