

B.Tech. SEM -II Electrical 2014 Course (CBCS) : WINTER - 2018
SUBJECT: ELECTRICAL AND ELECTRONICS DEVICES

Day : Saturday **W-2018-2276** Time : 10.00 AM TO 02.00 PM
Date : 17/11/2018 Max. Marks: 60.

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.

- Q.1** a) Define specific resistivity. Resistance of a wire is 100 ohm. If wire is elongated to double its length with decrease in cross sectional area to 25%. What is the new value of resistance? **(05)**
- b) Find out resistance for the following color code: **(05)**
Red Red orange silver
Blue Gray Black Gold.
Also write color code for 56 Mega ohm, 47 kilohm
What is the material used for resistor used in heating element of iron, motor winding.

OR

- Q.1** a) What are the different types of capacitors? State the specifications and applications of it. **(05)**
- b) Define self inductance and mutual inductance. Write down equation of self inductance and mutual inductance, inductive reactance and energy stored in inductance. **(05)**

- Q.2** a) Draw neat diagram of moving iron instrument and describe its operation with different types of torques in instrument. State its application. **(06)**
- b) Define sensitivity and accuracy of an instrument. **(04)**

OR

- Q.2** a) Draw schematic diagram for extension of range of voltmeter and derive equation of external resistance required to extend the range. **(06)**
- b) What are the different types of errors in instrument? Explain with example. **(04)**
- Q.3** a) Draw neat diagram of Kelvin's double bridge for resistance measurement and write down balance equation. If ratio arm is 10 and value of standard resistance 45 milliohm. What is unknown resistance? **(06)**
- b) Calculate the value of resistance, if the appliance is operated on 230V and classify it low/ medium resistance: **(04)**
(i) 3 kW oven (ii) 18 watts tube light
(iii) Motor armature winding drawing a current of 100 A.

OR

- Q.3** a) Draw neat diagram of Megger and describe its principle of operation. Why guard terminal is provided while measuring high resistance? **(06)**
- b) Describe the procedure of medium resistance measurement using voltmeter ammeter method. **(04)**

P.T.O.

- Q.4** a) With neat diagram, explain half wave diode rectifier with R-L load, draw the voltage and current waveforms on supply side, load side and across diode. (05)
b) Explain with neat diagram, construction and operation of cathode ray oscilloscope. (05)

OR

- Q.4** a) Explain with neat diagram, construction and working of shunt voltage regulator. (05)
b) With neat diagram, explain operation of seven segment display. State minimum 2 applications of it. (05)

- Q.5** a) Compare BJT and FET. (04)
b) With neat circuit diagram, explain common base transistor characteristics, draw nature of input and output characteristics for this configuration. (06)

OR

- Q.5** a) Draw and explain following characteristics of FET. (05)
(i) Drain characteristics (ii) Transfer characteristic
b) Explain voltage divider biasing circuits of transistor. (05)

- Q.6** a) With neat diagram, explain construction and operation of transformer coupled multistage transistor amplifier. (06)
b) What are oscillators, explain Barkhausen's criteria for oscillator. (04)

OR

- Q.6** a) Explain with neat diagram, working of class A power amplifier. (05)
b) Explain with neat diagram and suitable waveforms, working of astable multivibrator. (05)

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