

R09

Code No: 53025

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, March - 2017

BASIC ELECTRICAL ENGINEERING

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Show that volt-ampere relationship of R, L and C are linear.
b) Derive the equation for equivalent resistance of number of resistors connected in parallel and in series. [8+7]
- 2.a) Three $100\ \Omega$ resistors are connected first in star and then in delta across 415 V, 3-phase supply. Calculate the line and phase currents in each case and also the power taken from the source.
b) Explain Thevenin's, and Maximum power transfer theorems with example. [8+7]
- 3.a) Find average value, form factor and peak factor for an alternating waveform from the fundamentals.
b) A coil of resistance $10\ \Omega$ and inductance $0.1\ \text{H}$ is connected in series with a $150\ \mu\text{F}$ capacitor across 200V, 50 Hz supply. Calculate (i) Inductive reactance, Capacitance reactance, impedance, current and power factor. (ii) The voltage across the coil and capacitor respectively. [7+8]
4. Explain O.C and S.C Test on single phase Transformer, also derive equation for regulation of transformer. [15]
- 5.a) Explain Principle of operation of D.C generators.
b) Derive the equation for induced emf of a dc machine. [7+8]
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- 6.a) Write the Principle of operation of dc motors and explain significance of back emf in DC motors.
b) Explain different losses in DC motors. [7+8]
- 7.a) Explain the significance of slip in induction motor also explain working principle of Squirrel cage induction motor.
b) Explain the power stages of different losses in three phase induction motor and draw slip-torque characteristics of induction motor. [7+8]
- 8.a) Write about deflecting torque, controlling torque and damping torque used in indicating instruments.
b) Explain about repulsion moving iron ammeter with neat diagram. [8+7]

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- 2.a) Three 100Ω resistors are connected first in star and then in delta across 415 V, 3-phase supply. Calculate the line and phase currents in each case and also the power taken from the source.
b) Explain Thevenin's, and Maximum power transfer theorems with example. [8+7]
- 3.a) Find average value, form factor and peak factor for an alternating waveform from the fundamentals.
b) A coil of resistance 10Ω and inductance 0.1 H is connected in series with a $150 \mu\text{F}$ capacitor across $200\text{V}, 50 \text{ Hz}$ supply. Calculate (i) Inductive reactance, Capacitance reactance, impedance, current and power factor. (ii) The voltage across the coil and capacitor respectively. [7+8]
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