

JK LAKSHMIPAT UNIVERSITY, JAIPUR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
EndTerm Examination (Regular/Backlog), April-May2018
B. Tech. Ist Year, Semester-II

EE 101-Electrical & Electronics Engineering

Roll No.....

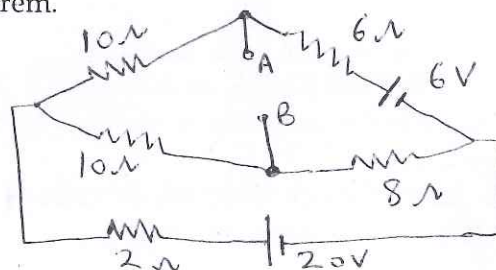
Time: 3 hours

Max. Marks: 100

Instructions to students:

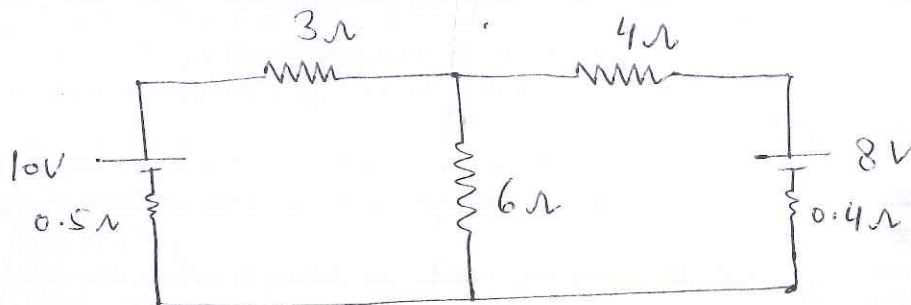
1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

- Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10**
- i. Which of the following is the passive element: (a) Capacitance (b) Ideal current source (c) ideal voltage source (d) All of the above
 - ii. For maximum transfer of power, internal resistance of the source should be: (a) equal to load resistance (b) less than the load resistance (c) greater than the load resistance (d) none of the above
 - iii. A sine wave voltage is applied across an inductor, when the frequency of voltage is increased, the current is: (a) increases (b) decreases (c) remains the same (d) zero.
 - iv. In a three phase AC circuit, the sum of all three generated voltages is: (a) Infinite (b) Zero (c) One (d) None of the above
 - v. In a Transformer , The primary flux is always _____ the secondary (flux): (a) Greater then (b) Smaller then (c) Equal (d) Equal in both step up and Step down Transformer
 - vi. The number of parallel path in a simplex lap winding is equal to: (a) number of poles (b) number of pole pairs (c) two (d) two times number of pole
 - vii. For single phase supply frequency of 50 Hz, ripple frequency in full wave rectifier is: (a) 25 (b) 50 (c) 100 (d) 200
 - viii. The form factor for half wave rectified sine wave is: (a) 1.0 (b) 1.11 (c) 1.44 (d) 1.57.
 - ix. In a transistor, the base current is about of emitter current: (a) 25% (b) 20% (c) 35 % (d) 5%
 - x. In a communications system, noise is most likely to affect the signal: (a) at the transmitter (b) in the channel (c) in the information source (d) at the destination
- Q.2 Short answer type questions (4 questions @ 2.5 marks) 10**
- i. Define active and passive elements with example.
 - ii. Define series resonance and resonant frequency.
 - iii. How Zener diode works as a voltage regulator?
 - iv. Define modulation. What are the different types of modulation?
- Q.3A Calculate current in a 10 ohm resistor connected between terminals A and B, as shown in the below figure with the help of Thevenin's theorem. 05**



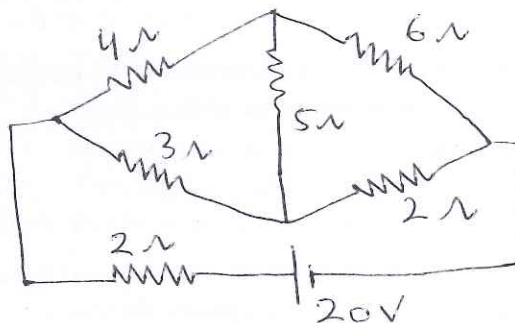
- Q.3B Explain the working principle of single phase transformer. 05**
- A 1250 VA transformer has a primary voltage of 11000V at 50 Hz with 182 & 40 turns on primary and secondary respectively. calculate (a) no load secondary emf (b) full load primary & secondary currents.

- Q.4A A coil of 10 ohm and 0.4 H is in series with a capacitor of 40 mF. A voltage of 200 volt at variable frequency is applied to the circuit. At what frequency will the current be maximum? Also calculate current, voltage across the coil and capacitor at this frequency. 05
- Q.4B Explain the operation of C and pi filter and draw its waveform. 05
- Q.5A Draw the electromagnetic spectrum and therein indicate the frequency ranges for the three types of communication media. 05
- Q.5B Explain the working principle of DC Generator. Why is a commutator and brush arrangement necessary for the operation of DC generator. 05
- Q.6A A balanced 3-phase star-connected load of 18 kW taking a leading current of 60 amperes when connected across a 3-phase 440 V, 50 Hz supply. Find the values and nature of load. 05
- Q.6B Using superposition theorem, calculate the current in the AB branch in the circuit shown in below figure : 05



OR

- Q.6B Explain the operation and characteristics of PN junction diode with suitable diagram. 05
- Q.7A Draw the block diagrams of a superheterodyne receiver and explain the function of each block. What is the basic principle of super-heterodyne receiver? 05
- Q.7B What are the various parts of squirrel cage induction motor and explain the construction of stator with suitable diagram. 05
- OR
- Q.7B A series R-L-C circuit having $R = 10 \text{ ohm}$, $L = 0.1 \text{ H}$ and $C = 8 \mu\text{F}$ connected to 230 V, 50 Hz supply. Determine (i) Resonant frequency (ii) Q-factor of the circuit at resonance (iii) the half power frequencies (iv) bandwidth (v) current at resonance. 05
- Q.8A Calculate the current through 20 ohm resistor and the total current delivered by the battery. By using nodal and mesh analysis. 10



- Q.9A Explain the operation of NPN transistor. 10
A transistor that has a collector current of 3 mA and emitter current of 3.03 mA. Calculate the new currents in the transistor is replaced by a new device that has $\beta = 75$, if the base current is unchanged.
- Q.9B With the help of block diagram describe the working of a satellite communication and its short note on earth station receiver. 10
- OR
- Q.9B Three coils each of impedance $20 \angle 60^\circ \text{ ohm}$ are connected in star across a 400 V, 3-phase, 50 Hz supply. Find the reading on each of the two wattmeters connected to measure the power input. If the same impedances were connected in delta across the same supply, find the corresponding readings of the wattmeters. Find the reactive power and the apparent power. 10