

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EE100

Course Name: BASICS OF ELECTRICAL ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 4 marks.

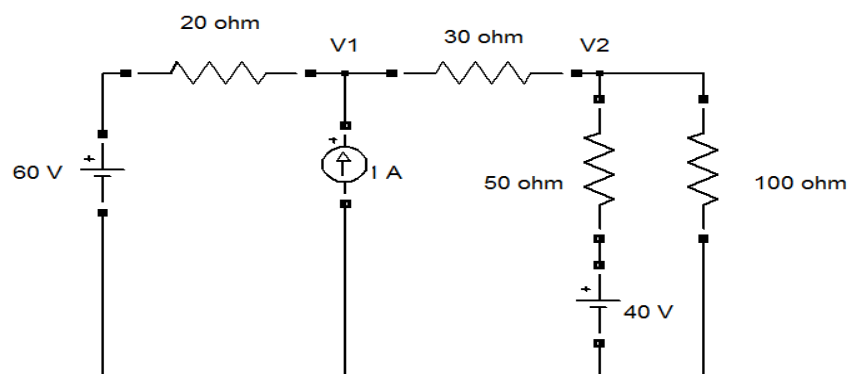
- | | | Marks |
|----|---|-------|
| 1 | Explain Kirchhoff's voltage and current law with example. | (4) |
| 2 | Compare electric and magnetic circuits. | (4) |
| 3 | Calculate the RMS and average values of a purely sinusoidal current having peak value 15A. | (4) |
| 4 | What is the phase angle relationship between applied ac voltage and circuit current in a purely inductive circuit? Prove your answer. | (4) |
| 5 | What factors are taken in to account while selecting the site for thermal power plant? | (4) |
| 6 | Distinguish between primary transmission and secondary transmission. | (4) |
| 7 | Explain the principle of operation of single phase transformer. | (4) |
| 8 | What is back e.m.f. concerned with DC motors. Write the voltage equation representing back emf. | (4) |
| 9 | Calculate the speed of a 6 pole, 50Hz, 400V 3-phase induction motor when it is operating at a slip of 2%. | (4) |
| 10 | With neat diagram, explain the working of split phase induction motor. | (4) |

PART B

MODULE (1-4)

Answer any four questions, each carries 10 marks.

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| 11 | Find current in 100 ohm resistor using node analysis. | (10) |
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- 12 a) A ring shaped electromagnet has an air gap of 6mm and cross sectional area of 12 cm^2 . The mean length of the core (excluding air gap) is 60cm. Calculate the mmf required to produce a flux density of 0.4 Wb/m^2 in the gap. Take the relative permeability of the material as 400. (6)
- b) Derive the expression for energy stored in a magnetic field. (4)
- 13 A balanced three phase load consists of three coils each having resistance of 4Ω and inductance 0.02H . It is connected to a 415V , 50Hz , 3-phase ac supply. Determine the phase voltage, phase current, power factor and active power when the loads are connected in (i) star (ii) delta (10)
- 14 a) A 220V , 50Hz single phase sinusoidal voltage produces a current of 2.2A in a purely inductive coil. Determine (i) inductive reactance of the coil (ii) inductance (iii) power absorbed (iv) expression for applied voltage and current. (5)
- b) With the help of circuit diagram and phasor diagram derive the relation between line and phase voltages, and line and phase currents in a balanced delta connected system. (5)
- 15 Draw a neat schematic diagram of a Thermal power plant and explain its operation. (10)
- 16 Explain about any two types of available Non-conventional energy sources. (10)

MODULE 5

Answer any one full question, each carries 10 marks.

- 17 a) Explain the construction and working of DC generator. (5)
- b) A four pole wave connected armature has 1000 conductors and flux per pole is 0.05wb . Calculate the emf generated when the generator is running at a speed of 1200rpm . (5)
- 18 A 40 kVA transformer has a core loss of 450W and a full load copper loss of 850W . If the power factor of the load is 0.8 , calculate (i) full load efficiency (ii) maximum efficiency (iii) the load at which maximum efficiency occurs. (10)

MODULE 6

Answer any one full question, each carries 10 marks.

- 19 Explain the constructional details of squirrel cage and slip ring induction motor (10)
- 20 With suitable diagrams explain the principle of operation of a capacitor-start induction motor. Compare it with split-phase motor. Give one application. (10)
