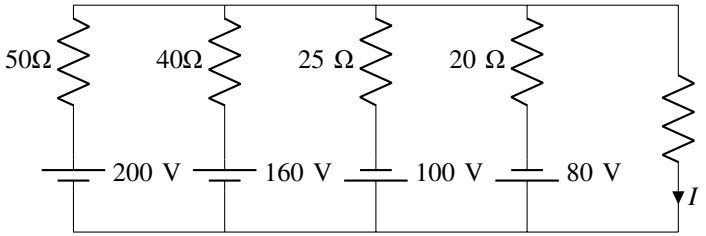
EE24BTECH11053 - S A Aravind Eswar

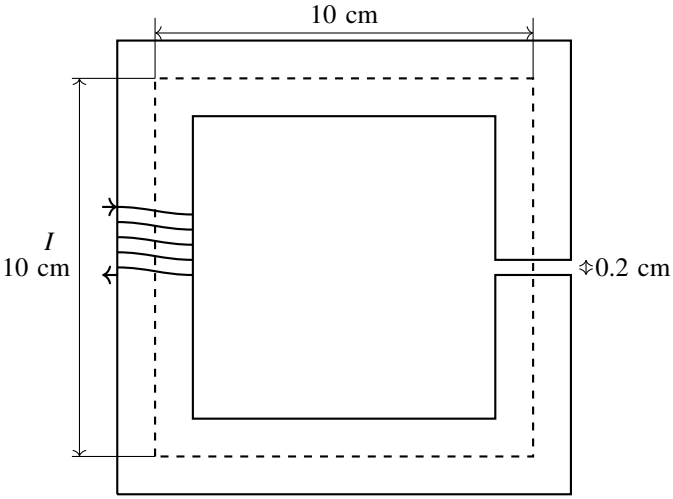
1) The probablity of a resistor being defective is 0.02. There are 50 such resistors in a circuit. The probability of two or more defective resistors in the circuit (round off to two decimal places) is _____. [2019 - EE]
2) A 0.1 μF capasitor charged to 100 V is discharged through 1 kΩ resistor. The time in ms (round off to two decimal places) required for the voltage across the capasitor to drop to 1 V is _____. [2019 - EE]
3) The current I flowing in the circuit shown below in amperes is _____. [2019 - EE]



4) The volatage across and the current through a load are expressed as follows

$$v(t) = -170\sin\left(377t - \frac{\pi}{6}\right)\text{V}$$
$$i(t) = 8\cos\left(377t + \frac{\pi}{6}\text{A}\right)$$

The average power in watts (round off to one decimal place) consumed by the load is _____. [2019 - EE]
5) The magnetic circuit shown below has uniform cross-section area and air gap of 0.2 cm. The mean path length of the core is 40cm. Assume that leakage and fringing fluxes are negligible. When the core relative permeability is assumed to be infinite, the magnetic flux density computed in the air gap is 1 tesla. With the same Ampere-turns, if the core relative permeability is assumed to be 1000 (linear), the flux density in tesla (round off the three decimal places) calulated in the air gap is _____. [2019- EE]



6) A single-phase transformer of rating 25 kVA, supplies a 12 kW load at power factor 06 lagging. The additional load at unirt power factor in kW(round off to two decimal places) that may be added before this transformer exceeds it's rated kVA is _____. [2019 - EE]

7) A 220 V CD shunt motor takes 3 A at no-load. It draws 25 A when running at full-load at 1500 rpm. The armature and shunt resistances are 0.5 Ω and 220 Ω, respectively. The no-load speed in rpm (round off to two decimal places) is _____. [2019 - EE]

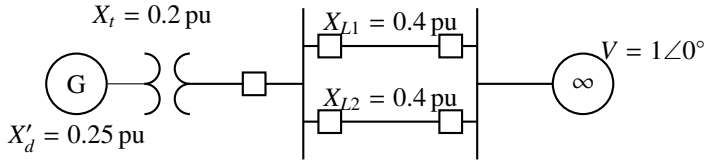
8) A delta-connected, 3.7 kW, 400 V(line), three-phace, 4-pole, 50-Hz squirrel-cage induction motor has the following equivalent circuit parameters per phase referred to the stator: $R_1 - 5.39\Omega, R_2 = 5.72\Omega, X_1 = X_2 = 8.22\Omega$. Neglet shunt branch in the equivalent circuit. The starting line current in amperes (round off the two decimal places) when it is connected to a 100 V (line), 10 Hz, three-phase AC source is _____. [2019 - EE]

9) A 220 V (line), three-phase, Y-connected, synchronous motor has a synchorous impedance of $(0.25 + j2.5)\Omega$/phase. The motor draws the rated current of 10 A at 0.8 pf leading. The rms value of line-to-line internal voltage in volts (round off to two decimal places) is _____. [2019 - EE]

10) A three-phase 50 Hz, 400 kV transmission line is 300 km long. The line inductance is 1 mH/km per phase, and the capacitance is 0.01 *mu*F/km per phase. The line is under open circuit condition at the receiving end and energized with 400 kV at the sending end, the receiving end line voltage in kV (round off to two decimal places) will be _____. [2019 - EE]

11) A 30 kV, 50 Hz, 50 MVA generator has the positive, negative, and zero sequence reactances of 0.25 pu, 0.15 pu, and 0.05 pu, respectively. The neutral of the generator is grounded with a reactance so that the fault current for a bolted LG fault and that of a bolted three-phase fault at the generator terminal are equal. The value of grounding reactance in ohms (round off to one decimal place) is _____. [2019 - EE]

12) In the single machine infinite bus system shown below, the generator is delivering the real power of 0.8 pu at 0.8 power factor lagging to the infinite bus. The power angle of the generator in degrees (round off to one decimal place) is _____. [2019 - EE]



13) In a 132 kV system, the series inductance up to the point of circuirbreaker locationis 50 mH. The shunt capasitance at the circuit breaker terminal is 0.05 μF. The critical value of resistance in ohm required to be connected across the circuit breaker contacts which will give no transient oscillation is. _____. [2019 - EE]