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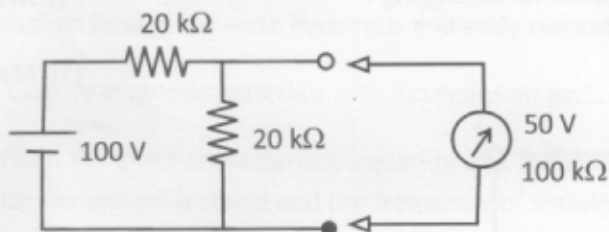
048/21

Total Number of Questions : 32

Time : 3.00 Hours

Max. Marks : 200

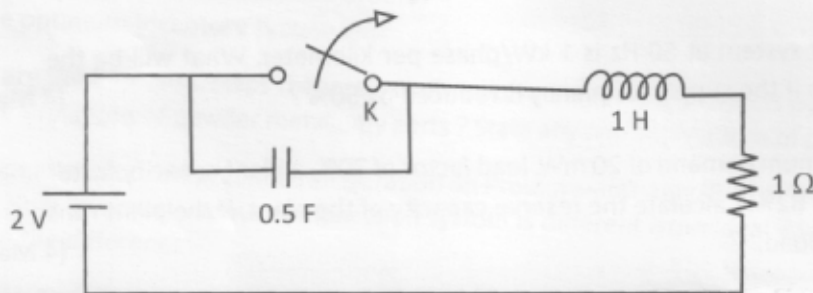
1. Derive the torque-current characteristic of a DC series motor. (2 Marks)
2. How accuracy and precision are different ? (2 Marks)
3. What are the advantages, if a free wheeling diode is connected in a single phase half wave controlled converter ? (2 Marks)
4. Compare various compensating networks used in control system. (2 Marks)
5. Explain the importance of surge impedance compensation. (2 Marks)
6. Obtain Poisson's equation and Laplace equation from Gauss's Law. (4 Marks)
7. The corona loss on a particular system at 50 Hz is 1 kW/phase per kilometer. What will be the corona loss on the same system if the supply frequency is reduced by 50% ? (4 Marks)
8. A generating station has a maximum demand of 20 MW, load factor of 70%, a plant capacity factor of 50% and a plant use factor of 82%. Calculate the reserve capacity of the plant, if the plant runs as per the schedule and on full load. (4 Marks)
9. What are the advantages, if a free wheeling diode is connected across the R-L load of half wave controlled rectifier ? (4 Marks)
10. A 66 kV system has four disc string insulator with shunt capacitance to self capacitance ratio of 0.1. Calculate string efficiency. (4 Marks)
11. Find out the percentage error of the voltmeter reading in the following circuit. (5 Marks)



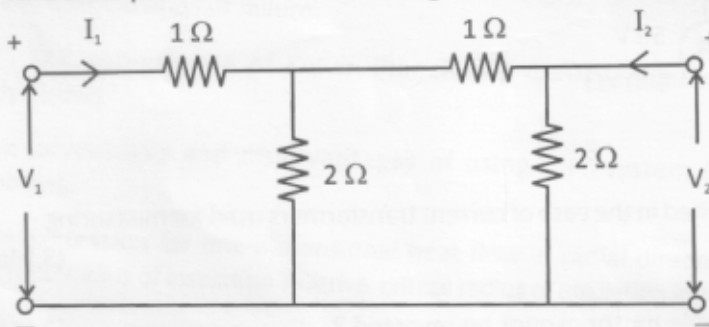
12. What happens if the secondary open circuited in the case of current transformers used for measuring purposes ? (5 Marks)
13. Why the rotation direction of a shaded pole motor cannot be reversed ? (5 Marks)
14. Describe the function of Snubber circuit in power electronics. (5 Marks)

P.T.O.

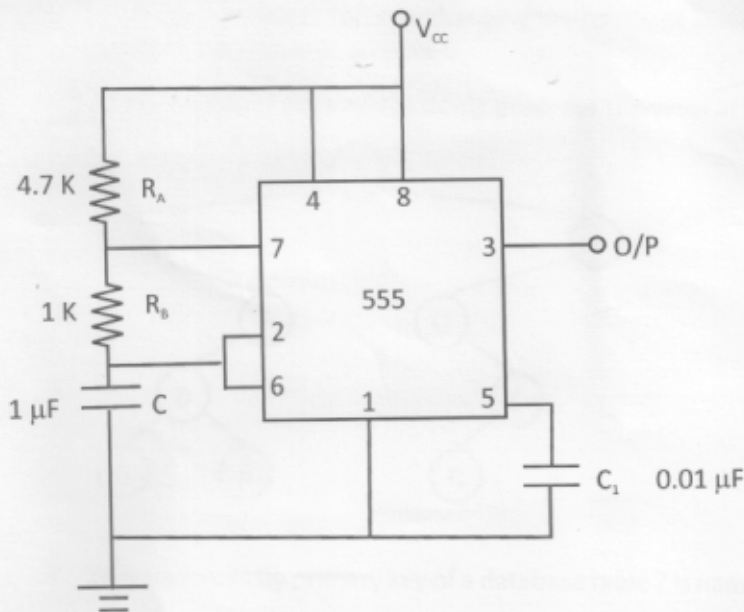
15. What are the special features incorporated in an electro-dynamometer type wattmeter to measure low power factor as low as 0.1? (5 Marks)
16. Derive the equations to find out the power factors at which maximum and minimum voltage regulation occurs in the case of single phase transformer. (5 Marks)
17. Explain the pinch off in the case of JFET characteristics, how it varies on external biasing. (5 Marks)
18. List out the characteristics of ideal operational amplifier. (7 Marks)
19. Explain the classifications of large signal amplifiers. (7 Marks)
20. The network below allows steady state with switch closed. At $t = 0$, the switch is opened. Find the voltage across the switch V_K and $\frac{dV_K}{dt}$ at $t = 0^+$. (7 Marks)



21. A parallel plate capacitor with free space between the plates is connected to a constant voltage. Compare the voltage gradient, if a mica sheet with permittivity 5.4 is inserted in 20% of the space between plates. (7 Marks)
22. A 100 kVA transformer has a copper loss of 1000 W at full load and an iron loss of 1000 W. What will be the efficiency at half of full load and 0.8 power factor lagging? (7 Marks)
23. Find the Z parameters of the circuit given below. (10 Marks)



24. Calculate the ON time, OFF time, free running frequency and duty cycle for the circuit given below. (10 Marks)



25. Derive Maxwell's equation in differential form from Ampere's law. (10 Marks)
26. A DC machine consists of a shunt and series winding with resistance 40Ω and 0.03Ω respectively. The armature winding resistance is 0.03Ω and also has a brush drop of 2 V . Calculate the generated voltage, in all the four operating modes, if the terminal voltage is 250 V with a load current of 100 A . (10 Marks)
27. What are the time domain specifications of a second order underdamped system subjected to a unit step input? (10 Marks)
28. Explain digital data acquisition system with block diagram. (10 Marks)
29. Explain how to separate hysteresis and eddy current losses in a single phase transformer. (10 Marks)
30. Classify magnetic materials with examples on each category. (10 Marks)
31. From the given characteristic equation of a feedback control system, determine the range for k , for the system is stable and the frequency of sustained oscillations. (10 Marks)
32. List out and explain various registers of 8085 microprocessor. (10 Marks)