H.T No: | | | | | | | | | | | R22

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination : **B.Tech III Sem Regular & Supplementary Examinations December-2024**
Course Name : **Electrical Circuit Analysis-II**
Course Code : **A402203**
Branch : **Electrical & Electronics Engineering**
Date & Session : **21-12-2024 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Write the equation for time constant of RL Circuit. 1 M
2. Define transient response. 1 M
3. Define Laplace transform? 1 M
4. Write initial value theorem? 1 M
5. Give the expressions for symmetry and reciprocity in case of Z-parameters. 1 M
6. What are the applications of hybrid parameters and ABCD parameters. 1 M
7. Define Discrete spectrum 1 M
8. Write the Fourier integral equation 1 M
9. Differentiate between Low Pass and High pass filters 1 M
10. Draw the Constant k High pass filter diagram 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Determine the complete solution for the current when switch S is closed at t = 0, for series RL circuit. Applied voltage is 10M

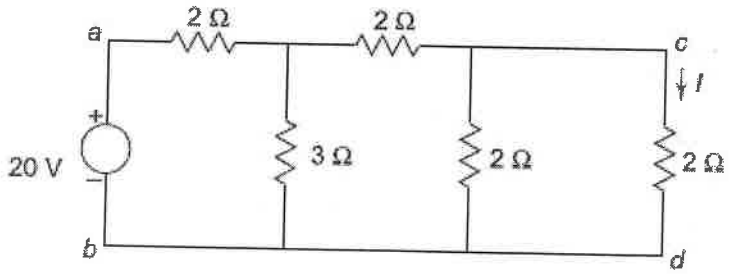
$$v(t) = 50 \cos\left(10^2 t + \frac{\pi}{4}\right)$$

Resistance R = 10 Ω and L = 10 m H.

OR

11. B). Derive the Transient response of series RC circuit for an DC excitation. 10M

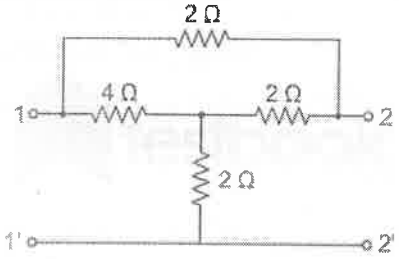
12. A). Determine the ABCD-parameters for the circuit as shown in figure. 10M



(P/T.O..)

OR

12. B). Find the Z-parameters for the circuit shown below. 10M

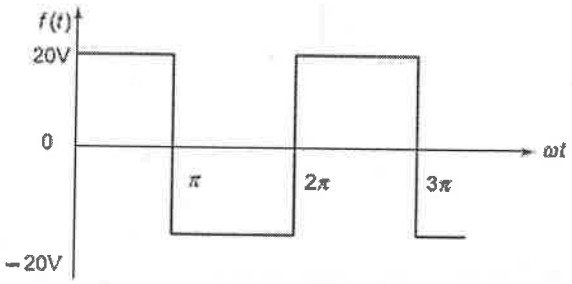


13. A). Derive the expression for transient response in series R-L-C circuit for Step excitation. Obtain the solution using Laplace transforms. 10M

OR

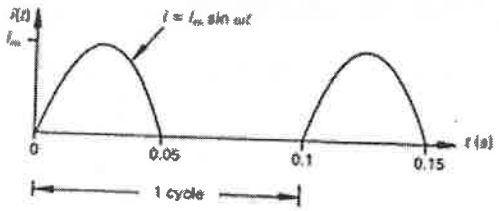
13. B). Derive an expression for voltage across R and C in an R-C series circuit when the circuit is excited with sinusoidal input using Laplace Transform. 10M

14. A). Determine the Fourier series for the wave in figure. 10M



OR

14. B). Determine the Fourier Exponential series for the wave in figure 10M



15. A). Design a Constant-K Band Pass filter with neat diagram. 10M

OR

15. B). Design a m-derived high pass filter with a cut-off frequency of 10 kHz; design impedance of 5 Ω and m = 0.4. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech III Sem Regular & Supplementary Examinations December-2024**
Course Name : **Electro Magnetic Fields**
Course Code : **A402302**
Branch : **Electrical & Electronics Engineering**
Date & Session : **24-12-2024 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Write the expression for (ds) when the surface lies in XZ -plane in cylindrical coordinate system? 1 M
2. Write an expression for differential length, surface and volume in Cartesian coordinate system. 1 M
3. Define Electric potential. 1 M
4. Define Electric Dipole. 1 M
5. What is the Ohm's law in point form? 1 M
6. Write an expression for Continuity equation. 1 M
7. State Maxwell's third equation. 1 M
8. Define inductance and mutual inductance. 1 M
9. Write an expression of Displacement Current. 1 M
10. State Faraday's law of Electromagnetic induction. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the dot and cross product relations of both similar and dissimilar combination of unit vectors in rectangular coordinate system. 10M

OR

11. B). Discuss the conversion of a coordinates from one coordinate system to another coordinate system. 10M

12. A). State and prove Maxwell's first law and also write expressions of potential difference for different charge distributions. 10M

OR

12. B). Find the D in Cartesian coordinate System at point p(6,8,-10) due to i) a point charge of 40 mC at the origin ii) a uniform line of Charge ρ_l of 40 μC/m on the z-axis and iii) a uniform surface charge density ρ_s of 57.2 $\mu C/m^2$ on the plane x=12m. 10M

13. A). Obtain boundary conditions between (i) conductor and dielectric, (ii) between two dielectrics. 10M

OR

13. B). Discuss the concept of Capacitance and Capacitance of coaxial cable. 10M

(P.T.O..)

14. A). A steady state current of 'I' amps flows in a conductor which is bent in the form of a square loop of side 'a'. Find $\bar{H}$ at the center of the loop? 10M

OR

14. B). In cylindrical co-ordinates $\bar{A}$=50 r^2 $\overline{az}$ wb/m is a vector magnetic potential, in a certain region of free space. Find $\bar{H}$,$\bar{B}$,$\bar{J}$ and using $\bar{J}$ find total current 'I' crossing the surface $0 \leq r \leq 1, 0 \leq \Phi \leq 2\pi$ and z=0. 10M

15. A). Write short notes on Faraday's law and explain about statically induced EMF and dynamically induced EMF in time variant fields. 10M

OR

15. B). Find the conduction and displacement current densities in a material having conductivity of $\frac{10^{-3}\,S}{m}$ and $\epsilon_r = 2.5$ if the electric field in material is $E = 5.8 \times 10^{-6} \sin(9.0 \times 10^9 t)$V/m. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination : **B.Tech III Sem Regular & Supplementary Examinations December-2024**
Course Name : **Power System-I**
Course Code : **A402303**
Branch : **Electrical & Electronics Engineering**
Date & Session : **30-12-2024 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	What is the principle operation of a gas turbine power plant?	1 M
2.	What are the factors which affect the location of site of hydro power station?	1 M
3.	What is proximity effect?	1 M
4.	State any two types of insulators used on overhead lines.	1 M
5.	What are the advantages in a distribution system?	1 M
6.	What are the requirements of distribution systems?	1 M
7.	How does AC distribution differ from DC distribution?	1 M
8.	What is the criteria for selecting a suitable size of the conductor for a distributor?	1 M
9.	What is a tariff?	1 M
10.	What is the load duration curves?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Draw a typical layout of a Hydro station and explain the functions of various components?	10M
	OR	
11. B).	Compare salient features of the following power plants i) Nuclear ii) Gas power plants.	10M
12. A).	A single phase line operates at 50 HZ. The diameter of each conductor is 20 mm and the spacing between the conductor is 3m. Calculate the i) Inductance of each conductor/km ii) Loop inductance of the line per km iii) Inductive reactance per km iv) loop inductance per km of the line when the conductor is steel of relative permeability 50.	10M
	OR	
12. B).	Explain potential distribution over a string of suspension insulators.	10M
13. A).	Briefly compare the overhead and underground distribution systems?	10M
	OR	
13. B).	A distributor is fed at both ends at same voltage 250V. The total length of the feeder is 200m and the loads are tapped off as follows. 50A at 50m from A, 40A at 75m from A, 30A at 100m from A and 25A at 150m from A. Calculate i) the point of minimum potential ii) the current in each section iii) the voltage at each load point.	10M

(P.T.O..)

14. A). Four industrial centers are located at the corners of a square of 25 km side. The loads are 5000 kw, 8000 kw, 3000 kw and 6000 kw respectively. Determine the best location of the substation for feeding these loads? 10M

OR

14. B). Discuss the various busbar systems for distribution networks. 10M

15. A). Explain the following terms: 10M
i) Connected load ii) Maximum demand iii) Demand factor iv) load factor.

OR

15. B). A system has a straight line annual load duration curve with maximum and minimum demands of 15 MW and 5 MW respectively. The annual cost characteristics of base load and peak load stations are respectively given by 10M
C_1 = (Rs 10,00,000 + Rs 100/Kw + 6 P/Kwhr)
C_2 = (Rs 80,000 + Rs 60/Kw + 8 P/Kwhr)
Determine the operating schedule of peak load station for maximum annual cost. Hence determine the overall cost per Kwhr?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech III Sem Regular & Supplementary Examinations Dec-2024/Jan-2025**
Course Name : **Electrical Machines-I**
Course Code : **A402301**
Branch : **Electrical & Electronics Engineering**
Date & Session : **07-01-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define DC Generator. 1 M
2. Write the EMF equation of DC Generator. 1 M
3. What is Back EMF? 1 M
4. Write the condition for maximum efficiency. 1 M
5. What is direct test? 1 M
6. What is indirect test? 1 M
7. Define Regulation. 1 M
8. Illustrate hysteresis current losses. 1 M
9. Define Efficiency. 1 M
10. Explain turns-ratio. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is armature reaction? What are the effects of armature reaction? 10M

OR

11. B). A 4-pole wave wound DC shunt generator runs at 1000 rpm when supplying 330 lamps each rated at 60 W, 110 V. it has a shunt field current of 2 A. there are 90 commutator segments and brush width is equal to 1.1 commutator segments. The self inductance of each coil is 0.025 mH. Determine the reactance voltage if the commutation is (i) linear (ii) sinusoidal. 10M

12. A). Explain the principle of dc motor. Also derive the expression for torque. 10M

OR

12. B). A 6-pole, 500 V wave connected shunt motor has 1200 armature conductors and useful flux/ploe of 20 mwb. The armature and field resistances are 0.5 ohm and 250 ohm respectively. What will be the speed and torque developed by the motor when it draws 20A from the supply mains? Neglect armature reaction. If magnetic and mechanical losses amount to 900 W find (i) useful torque (ii) output n kW (iii) efficiency at this load. 10M

13. A). Explain about the testing of DC machines by using the Field's test. 10M

OR

13. B). The Hopkinson's test on two shunt machines gave for full load the following results: line voltage=220V, line current excluding field currents=12 A, motor armature current= 72 A, field currents = 1.5 A and 1 A. the armature resistance of each machine is 0.2 ohm. Calculate the efficiency of each machine. 10M

(P.T.O.)

14. A). Explain the operation of a transformer and sketch phasor diagram on no- load and on load. 10M

OR

14. B). Explain about types of transformer based on construction. 10M

15. A). Obtain the approximate equivalent circuit of a given 200/2000 V single phase 30 kVA transformer having the following test results. 10M

O.C test: 200 V, 6.2 A. 360 W on Lv side

S.C. test: 75 V, 18 A, 600 W on hv side.

OR

15. B). With the help of a neat diagram explain the working of a scott connection and open delta poly phase connections. What are its applications? 10M

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