CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination	:	B.Tech III Semester Supplementary Examinations July-2025
Course Name	:	Electrical Circuit Analysis-II
Course Code	:	A402203
Branch	:	Electrical & Electronics Engineering
Date & Session	:	03-07-2025 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 time constant of RC circuit.   1 M
2. What is the behavior of Inductor in Initial and Steady state conditions?   1 M
3. List the merits of Laplace transforms over classical methods.   1 M
4. Draw the S-domain equivalent of inductor used in circuit analysis.   1 M
5. Write the fourier series in exponential form.   1 M
6. What is the condition for even symmetry of a function?   1 M
7. What is the condition for symmetry in Z & Y parameters?   1 M
8. What are the necessary conditions for driving point function?   1 M
9. List out the disadvantages of constant – k filters.   1 M
10. Sketch the frequency response of a band elimination filter.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Using classical method of solution of differential equations, find the value of Vc(t) for t>0   10M
in the circuit shown in figure. Assume Vc(0-) = 9v
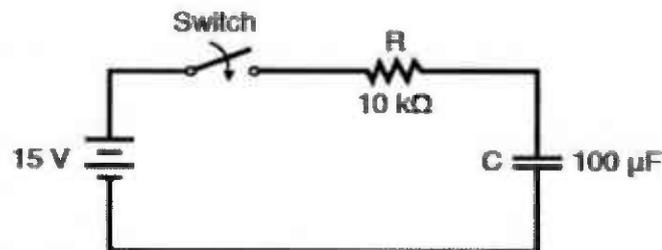
OR

11. B). Explain about the transient response of series RLC circuit to the AC excitation for zero   10M
initial conditions.

12. A). Obtain the expression for i(t) for a series RL circuit when exited by a step signal using   10M
Laplace transform.

(P.T.O..)

OR

12. B). For the RLC circuit shown, find the expression for the transient current using Laplace transform when the switch is closed at time t = 0. Assume initially relaxed circuit conditions.   10M
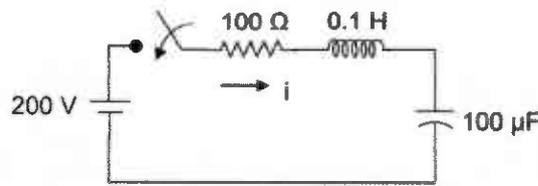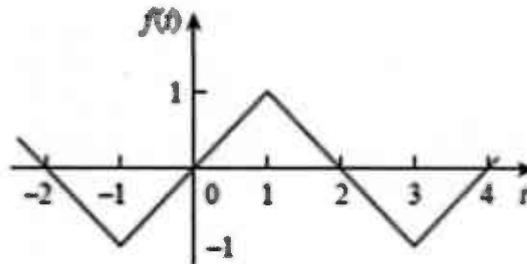

13. A). i) Derive the symmetry and reciprocity conditions for ABCD parameters and h-parameters.   5M

ii) Find the z-parameters for the network shown in figure.   5M
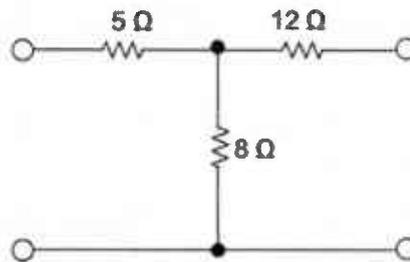
OR

13. B). Determine the Foster I form of realization of the RC impedance function $Z(S)=(S+1)(S+3)/S(S+2)(S+4)$ 10M

14. A). Calculate the Fourier series for the function shown in fig.   10M

OR

14. B). State and explain the properties of Fourier integral.   10M

15. A). Design a band pass filter with cutoff frequencies of 2000Hz and 5000Hz with a design impedance of 500 ohms.   10M

OR

15. B). Enumerate design considerations of constant K type-low pass filters.   10M

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Examination	:	B.Tech III Semester Supplementary Examinations July-2025
Course Name	:	Electro Magnetic Fields
Course Code	:	A402302
Branch	:	Electrical & Electronics Engineering
Date & Session	:	05-07-2025 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.	Give an example for Scalar Field.	1 M
2.	Name any three coordinate systems.	1 M
3.	What is electric field intensity?	1 M
4.	What is the significance of maxwell's first law?	1 M
5.	What is ohm's law in point form?	1 M
6.	Write Poisson's equation.	1 M
7.	What is biot-savart law?	1 M
8.	Analyze the effect of force on a moving charge.	1 M
9.	Define Displacement current density.	1 M
10.	What is faraday's law?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain the spherical coordinate system and how to convert rectangular coordinates to spherical coordinate system.	10M

OR

11. B).	Given three points in cartesian co-ordinate system as A (3, -2, 1), B (- 3, -3, 5), C (2,6, −4). Find The vector from A to the midpoint of the straight-line joining B to C.	10M

12. A).	Prove that electric field intensity is negative of gradient of electric potential.	10M

OR

12. B).	With the help of a neat diagram, explain how you determine electric field due to a line charge having infinite length.	10M

13. A).	Obtain the boundary conditions between two dielectric materials.	10M

OR

13. B).	Obtain the boundary conditions between conductor and dielectric materials.	10M
14. A).	Derive the expression for magnetic field due to a circular loop.	10M

OR

14. B).	Derive the expression for magnetic field intensity due to an infinite sheet of current carrying element.	10M
15. A).	Explain the integral form of maxwell's equations.	10M

OR

15. B).	Calculate the maximum Emf induced in a coil of 4000 turns of radius 12 cm rotating at 30 rps in a magnetic field of 500 gauss.	10M

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Examination	:	B.Tech III Semester Supplementary Examinations July-2025
Course Name	:	Electrical Machines-I
Course Code	:	A402301
Branch	:	Electrical & Electronics Engineering
Date & Session	:	08-07-2025 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. Which type of winding is selected for low voltage high current DC machines?   1 M
2. What are the different types of DC generators?   1 M
3. What are the characteristics of DC shunt motor?   1 M
4. List the different losses in in a DC machine.   1 M
5. What are the advantages of brake test?   1 M
6. Why Swinburne's test can not be performed on DC series machines?   1 M
7. What is meant by Step-up Transformers?   1 M
8. Why are iron losses considered as constant loss in transformers?   1 M
9. Why is the short circuit test performed on HV side?   1 M
10. What are the advantages of open delta connection?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Draw a neat sketch showing the different parts of a DC machine?   10M

OR

11.B). A short shunt DC compound generator supplies a load current of 280A at 100V. The armature, series and shunt field resistances are 0.02, 0.05 and 50 ohm respectively. Find the generated emf?   10M

12.A). Derive an expression for the torque developed in a DC machine?   10M

OR

12.B). A 230V DC series motor takes 45A when delivering its rated output at 1500 rpm. Its resistance is 0.3 ohm. Find what resistance must be added to obtain rated torque i) at starting and ii) at 1000 rpm?   10M

13.A). Describe with the aid of a circuit diagram the Hopkinson's test for a par of DC shunt machines. State the advantages of this method?   10M

OR

13.B). Briefly describe a test for separating the losses of a DC machine into its various components. Explain how the separation its done?   10M

(P.T.O..)

14. A). Derive an expression for voltage regulation of a transformer using its approximate 10M
equivalent circuit?

OR

14. B). A 100 KVA, 6.6 KV/415V single phase transformer has an effective impedance of (3+j8) 10M
ohm referred to the HV side. Estimate the full load voltage regulation at i) 0.8 pf lagging
and ii) 0.8 pf leading.

15. A). Draw the circuit diagrams for conducting OC and SC tests on a single phase transformer. 10M
Also explain how the efficiency and voltage regulation can be estimated by these tests?

OR

15. B). Explain the Scott connection of transformer for three - phase to two - phase conversion? 10M

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Examination	:	B.Tech III Semester Supplementary Examinations July-2025
Course Name	:	Power Systems-I
Course Code	:	A402303
Branch	:	Electrical & Electronics Engineering
Date & Session	:	10-07-2025 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. List the advantages and disadvantages of diesel power station.   1 M
2. Write a short note on hydro Electric Energy.   1 M
3. What is Skin Effect?   1 M
4. What is meant by Sag?   1 M
5. What is the application of DC distribution system?   1 M
6. Draw the neat sketch of ring main distributed system.   1 M
7. State any four advantages of a.c. systems.   1 M
8. Mention the differences between 3 wire and 3 phase 4 wire distribution system.   1 M
9. Mention advantages and disadvantages of two part tariff.   1 M
10. Define fixed-cost and running cost.   1 M

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

11.A). Draw the line diagram of Thermal power station and explain in detail.   10M

OR

11. B). Explain the principle of operation of nuclear reactor with neat diagram and mention its merits and demerits.   10M

12. A). Discuss Skin and proximity effects.   10M

OR

12. B). Derive the expression for the Sag when supports are at unequal levels and during the effect of ice and wind loading.   10M

13. A). A two-wire d.c distributor AB, 600 meters long is loaded as under: 10M

Distance from A (meters):	150	300	350	450
Loads in Amperes:	100	200	250	300

The feeding point A is maintained at 440V and that of B at 430V. If each conductor has a resistance of 0.01Ω per 100 meter, calculate

(i) The current supplied from A to B (ii). The power dissipated in the distributor

OR

13. B). i) Discuss the advantages of DC transmission over AC transmission.   5M

ii) Derive an expression for the power loss in a uniformly loaded distributor fed at both ends with equal voltages.   5M

(P.T.O..)

14. A). Draw and explain the phasor diagram for an a.c. distributor with power factors referred to the receiving end voltage   10M

OR

14. B). Draw and explain the phasor diagram for an a.c. distributor with power factors referred to the respective load voltages.   10M

15. A). i) Define load factor and Utilization factor   5M

ii) A generating station supplies the following loads: 15000 kW, 12000 kW, 8500 kW, 6000 kW and 450 kW. The station has a maximum demand of 22000 kw. The annual load factor of the station is 48%. Calculate (i) the number of units supplied annually (ii) the diversity factor and (ii) the demand factor.   5M

OR

15. B). Explain the following: 10M
(i) two part tariff
(ii) Block rate tariff
(iii) power factor tariff .

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