H.T No: | | | | | | | | | | | **R18** | **Course Code: A30205**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations January-2025

Course Name: Electrical Machines-II

(Electrical & Electronics Engineering)

Date: 09.01.2025 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. How do the coil span factor and distribution factor affect the generated EMF in a machine? 2 M
2. What is a distributed winding, and how does it differ from a concentrated winding? 2 M
3. List out the applications of a revolving magnetic field in electrical machines. 2 M
4. Why is spatial displacement between windings necessary for producing a revolving magnetic field? 2 M
5. State the merits and demerits squirrel cage induction machines. 2 M
6. How does supply frequency variation impact the speed of an induction motor? 2 M
7. What are the roles of the main and auxiliary windings in split-phase motors? 2 M
8. Why are AC series motors suitable for high-speed applications? 2 M
9. What are the advantages of salient pole type of construction used for synchronous machines? 2 M
10. State the conditions for synchronization of alternators. 2 M

PART-B

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

11.A). Discuss the process of winding distribution in the stator slots. How does it influence the machine's efficiency and harmonic content? 10M

OR

11. B). Explain the importance of the air gap between the stator and rotor in an electrical machine. How does it affect the performance of the machine? 10M

12. A). Discuss the advantages of a revolving magnetic field in the operation of induction motors and synchronous machines. Why is it preferred over other types of magnetic fields in AC machines? 10M

OR

12. B). Enumerate the impact of pulsating magnetic fields on the efficiency and operation of electrical machines. How are these effects mitigated in practical systems? 10M

13. A). Describe the no-load and blocked rotor tests for an induction motor. How are these tests used for predetermination of motor performance? 10M

OR

13. B). A 6-pole, 3-phase 50HZ induction motor is running at full load with a slip of 4%. The rotor is Star connected and its resistance and standstill reactance are 0.25 Ω and 1.5 Ω per phase. The emf between slip rings is 100V. Find the rotor current per phase and power factor assuming the slip rings are Short circuited. 10M

(P.T.O..)

14. A). Develop the equivalent circuit of a single-phase induction motor based on double revolving field theory. How is it used for performance analysis? 10M

OR

14. B). Explain the construction and operating principle of stepper motor with a neat sketch. 10M

15. A). Find the synchronous impedance and reactance of an alternator in which a given field current produces an armature current of 200A on short-circuit and a generated emf of 50V on open-circuit. The armature resistance is 0.1 ohm. To what induced voltage must be alternator be excited if it is to deliver a load of 100A at a p.f. of 0.8 lagging with a terminal voltage of 200V. 10M

OR

15. B). Draw the phasor diagram of Salient Pole Synchronous Machine and explain the concept of direct axis reactance and quadrature axis reactance. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30206**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations January-2025

Course Name: Network Theory-II

(Electrical & Electronics Engineering)

Date: 17.01.2025 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. What are the advantages of 3 phase system? 2 M
2. Write the relationship between line voltage and phase voltages in star connected system. 2 M
3. Why the current flowing through the inductor does not change instantaneously? 2 M
4. What is transient response for R-C circuit using DC excitation? 2 M
5. State the properties of driving point function. 2 M
6. List the necessary condition for transfer function. 2 M
7. Mention the standard equations for ABCD and Hybrid parameters. 2 M
8. Write the expressions for Y parameters of two two-port networks in Z parameters. 2 M
9. Write about wave symmetry. 2 M
10. List out the properties of Fourier transforms. 2 M

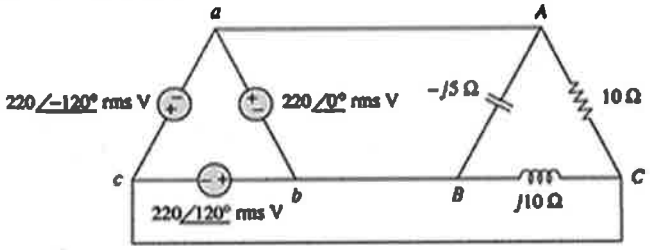
PART-B

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

11.A). Derive the relationship between phase and line current and line voltage of the delta connected system. 10M

OR

11. B). Find the line currents in the unbalanced three-phase circuit of Fig shown below and the real power absorbed by the load. 10M



12. A). Derive the expression for current in a series R-L circuit excited by DC Voltage source. 10M

OR

12. B). Derive an expression for voltage across 'R' in a series R-C circuit excited by a unit step voltage. Assume zero initial conditions. 10M

13. A). State the properties of transfer function and properties of driving point function. 10M

OR

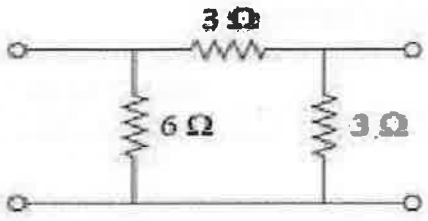
13. B). Test whether F(S)=(S+8) (S+2)/(S+4) (S+6) is positive real function. 10M

(P.T.O..)

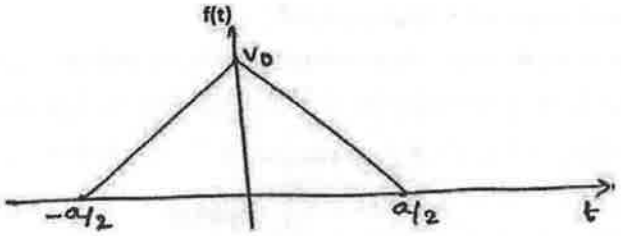
14. A). Explain Z-Parameters and transmission parameters. 10M

OR

14. B). Find Hybrid and Y parameters for the given network. 10M

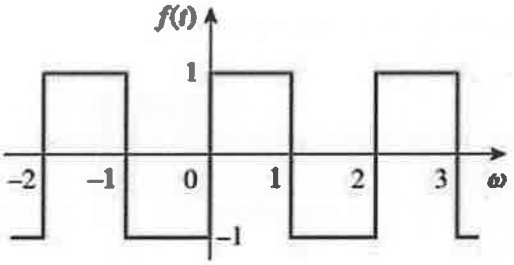


15. A). Find the Fourier transform of the triangular wave shown in figure. 10M



OR

15. B). Find the Trigonometric Fourier series of below waveform shown in figure 10M



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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30403**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations January-2025

Course Name: Switching Theory & Logic Design

(Electrical & Electronics Engineering)

Date: 20.01.2025 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. Convert the given gray code number to binary: 1001001011. 2 M
2. Illustrate the universal gates with its symbol and truth table. 2 M
3. Draw four bit adder circuit using full adders. 2 M
4. Distinguish the basic structure of PLA, PAL and PROM. 2 M
5. How to convert a D Flip Flop in to T Flip Flop? 2 M
6. Compare Latch and Flip-Flop. 2 M
7. What is a shift register? Name the different types of shift registers. 2 M
8. What do you mean by triggering? Explain the various triggering modes. 2 M
9. Distinguish between Mealy and Moore machines. 2 M
10. List the features of ASM chart. 2 M

PART-B

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

11.A). i) Realize a 2 input EX-OR gate using minimum number of 2 input NAND gates and NOR gates. 6M

ii) Encode the decimal numbers using 6, 3, 1, -1 weighted code. Is it a self complementing code 4M

OR

11. B). i) Prove the following expression using Boolean algebra and De-Morgan's theorems. 5M
Y'Z'+W'X'Z'+W'XY+WYZ'=Z'

ii) State various De-Morgan's theorems. 5M

12. A). i) Simplify the Boolean function F using the don't care conditions d, in sum of products 5M
F= A'B'D' + A'CD+A'BC
d=A'BC'D+ACD+AB'D'

ii) Using PAL, implement full adder digital circuit. 5M

OR

12. B). Implement the following functions with 8 to 1 multiplexer: 10M

$$f(w,x,y,z) = w\bar{x}\bar{y}z + w\bar{x}y\bar{z} + w\bar{y}$$

$$F(A,B,C) = A\bar{C} + A\bar{B}C + AB\bar{C}$$

13. A). What is a flip-flop? Design the basic flip-flop using NOR gates and explain. 10M

OR

13. B). Convert SR flip-flop to JK flip-flop with an example. 10M

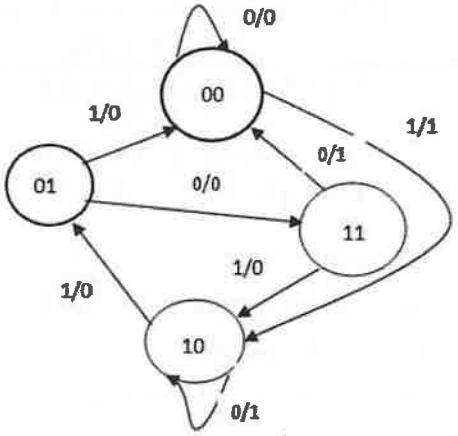
(P.T.O..)

14. A). What is a counter? implement and explain the basic operation of 4-bit up counter. 10M

OR

14. B). With neat diagram explain the operation of 3-bit universal shift register. 10M

15. A). A sequential circuit has one input and one output. The state diagram is shown below. Design the sequential circuit with SR flip-flop. 10M



OR

15. B). With an example explain the procedure for conversion of Moore machine to Mealy machine. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30204

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations January-2025

Course Name: Power Systems-I

Branch : EEE

Date: 27.01.2025 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What is the principle source of generation of electrical energy?	2 M
2.	Give the different classification of Nuclear Reactor and on what basis it is done.	2 M
3.	List the combustion characteristics of bio-gas.	2 M
4.	Differentiate between anaerobic and aerobic digestion.	2 M
5.	What is the importance of minimum potential on the distribution?	2 M
6.	Distinguish between Radial and Ring main distributor.	2 M
7.	List the different precautions that need to be considered in GIS.	2 M
8.	What role do synchronous capacitors play in voltage control?	2 M
9.	The value of demand factor and load factor are always less than one. Why?	2 M
10.	Mention the types of tariff's used for domestic and commercial loads.	2 M

PART-B

Answer any FIVE questions. One question from each unit either A or B (Compulsory)

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

11. A. Describe the following components of thermal power station with neat schematic diagram.
    a) Economizer b) Boilers — 10M

OR

11. B. a) Enumerate the factors affecting the site selection of hydroelectric power plant. — 5M
    b) What are the various types of commercial type of reactors and Explain Pressurized Water Reactor with neat diagram? — 5M

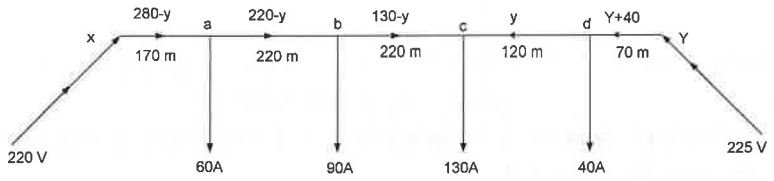
12. A. Discuss the role and potential of new and renewable energy sources. Explain the physics of the sun in energy generation. — 10M

OR

12. B. What is bio-gas digesters? Explain their types and the factors affecting gas yield. — 10M

13. A. A DC distributor of 800m is loaded as shown in below figure. The both ends X and Y are maintained at 220V and 225 V respectively. If the minimum voltage allowed at consumers end is 215 V find out the diameter of the conductor. The resistivity is 1.72 μΩcm. — 10M

(P.T.O)



OR

13. B. a) Explain the radial distribution system with neat diagram and list out its merits and demerits. 10M

14. A. a) Explain the single Bus - bar with Bus sectionalizer scheme with a neat connection diagram. 5M

b) Explain the constructional features and selection of area as criteria in gas insulated Substations. 5M

OR

14. B. a) Describe the off-load tap changing transformer method of voltage control. What are the limitations of the method? 5M

b) Explain the method of power factor improvement using phase advancer and discuss the advantages and disadvantages of this method. 5M

15. A. Explain in detail about i) Two-part tariff and ii) Power factor Tariff. 10M

OR

15. B. A Power system has following load particulars.

	Maximum demand	Load factor	Diversity factor
1)Residential load	1000KW	0.3	1.4
2)Commercial load	2000KW	0.5	1.2
3) Industrial load	3000KW	0.9	1.1

Overall diversity factor may be taken as 1.2.

a) Maximum demand on the system,

b) Daily energy consumption (total).

c) Overall load factor, and d) Connected load (total) assuming that demand factor for each load is unity. 10M

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