CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Regular/Supplementary Examinations November-2024
Course Name: HVDC Transmission
(Electrical & Electronics Engineering)

Date: 26.11.2024 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 is the need of HVDC Transmission system?	2 M
2.	Write any three applications of HVDC Transmission system.	2 M
3.	What is the apparatus required for HVDC Transmission system?	2 M
4.	What is firing angle control in HVDC Transmission system?	2 M
5.	What is Power Flow Analysis?	2 M
6.	What is a DC Network?	2 M
7.	Write a short note on the DC breakers?	2 M
8.	Write a short note on the Smoothing reactor?	2 M
9.	Why harmonics get generated in power systems?	2 M
10.	What is the difference between characteristic and non-characteristics harmonics?	2 M

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

11.A). Explain the types of HVDC links and its purpose with neat diagrams.   10M

OR

11. B). Explain about the characteristics of 6-pulse converter in HVDC Transmission system.   10M

12. A). Explain about conventional control strategies and Alternate control strategies in HVDC Transmission system?   10M

OR

12. B). Explain how the reactive power is provided by using AC filters and synchronous condensers also mention their advantages.   10M

13. A). How does Power Flow Analysis help in understanding electrical systems?   10M

OR

13. B). How does the Per-Unit (P.U.) system simplify calculations for DC quantities in power systems?   10M

14. A). Explain the basic principles of overcurrent protection.   10M

OR

14. B). Discuss the operation of surge arrestors for overvoltage protection of HVDC Systems.   10M

15. A). What are the adverse affects of harmonics produced by the HVDC converters   10M

OR

15. B). What are the various types of filters that are employed in HVDC Converter station? Discuss them in detail.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations November-2024
Course Name: Switched Mode Power Supply
(Electrical & Electronics Engineering)

Date: 26.11.2024 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 non-idealities present in power converters?	2 M
2.	Mention the semi-conductor losses present in power converters.	2 M
3.	Define is importance of duty cycle of power conversion.	2 M
4.	Mention the applications of boost converter.	2 M
5.	List out applications of resonant converters.	2 M
6.	State the basic concept of resonant converter?	2 M
7.	What are the limitations of transformer switching converters.	2 M
8.	Draw the diagram of half bridge converter.	2 M
9.	Draw the diagram of current filter	2 M
10.	How to select the capacitors for filters.	2 M

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

11.A). Explain the design procedure of inductor in SMP.   10M

OR

11. B). Explain the volt-second balance and amp-second balance principles to design reactive elements for a basic switching converter.   10M

12. A). Explain the operation of buck-boost converter with relevant waveforms.   10M

OR

12. B). A buck converter has an input voltage of 12V. The switching frequency is 10 KHz. The load is a resistor of 6 Ohms. The average load current is 1A. If the current ripple of the output inductor is limited to 0.1A and the ripple voltage of the output capacitor is 20mV. Determine the duty cycle, the filter capacitance and the output inductance.   10M

13. A). Explain the operation of ZCS resonant converter with neat circuit diagram.   10M

OR

13. B). Explain the operation of series-loaded resonant converter with neat circuit diagram.   10M

14. A). Explain push-pull converter basic operation with necessary waveform.   10M

OR

14. B). Explain the operation of current-mode quasi-resonant switches.   10M

15. A). With circuit diagram explain the working principle of online UPS.   10M

OR

15. B). What are power conditioners, briefly explain them?   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Regular/Supplementary Examinations November-2024
Course Name: Utilization of Electrical Energy
(Electrical & Electronics Engineering)

Date: 28.11.2024 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 is the nature of intermittent and variable loads?	2 M
2.	List the types of motors used for Electric drive.	2 M
3.	What is Dielectric heating?	2 M
4.	What are the advantages of Electric heating?	2 M
5.	What is photometry?	2 M
6.	What is 'Luminous flux'?	2 M
7.	What do you mean by Electric traction?	2 M
8.	What are the requirements of ideal traction system?	2 M
9.	What is the Coefficient of adhesion?	2 M
10.	Explain the tractive effort for propulsion of train.	2 M

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

11.A). Discuss the various factors which affect the selection of motor for a particular drive?   10M

OR

11. B). Explain how Electric drives are classified and illustrate them with their relative merits and demerits.   10M

12. A). List and explain the different methods of Electric welding in brief.   10M

OR

12. B). Discuss the comparison between Ac and DC welding.   10M

13. A). Explain Laws of illumination and its limitations in actual practice.   10M

OR

13. B). Explain the following terms: i) Solid angle ii) MSCP iii) Candle power iv) MHCP and v) Illumination.   10M

14. A). Explain clearly regenerative braking when used for DC series traction motors? How does it differ from the regenerative braking as used for DC shunt motors?   10M

OR

14. B). Two motors rated at 1500V have armature resistance of 0.15 ohm and take current of 500A each during starting. The effective weight of the train 140 tonnes, dead weight120 tonnes, specific resistance of 50 Newtons/tonne, tractive effort/motor 38000 Newtons, speed at the end of the starting period 40 Kmph, determine i) duration of starting period ii) speed of train at transition iii) Rheostatic loss.   10M

(P.T.O..)

15. A). Explain the following terms i) Adhesive weight ii) Dead weight.   10M

                                    OR

15. B). Explain the term 'Specific energy consumption' and discuss the factors which affect the   10M
        specific energy consumption of trains operating at a given schedule speed?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations November-2024
Course Name: Reliability Engineering
(Electrical & Electronics Engineering)

Date: 03.12.2024 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. Define Probability density function and write its expression.   2 M
2. Define Random variable and mention its types.   2 M
3. What is reduced event tree?   2 M
4. Define Series system.   2 M
5. Define hazard rate.   2 M
6. Write the expression for MTTF of 2-component series system.   2 M
7. Draw the Combined State Space Diagram of two component repairable model.   2 M
8. Differentiate Markov chains and Markov processes.   2 M
9. Write the expressions for equivalent failure rate, repair time, Unavailability of two component parallel system.   2 M
10. Define Minimal Cutset.   2 M

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

11.A). Derive the expression for Expected value of Binomial Distribution.   10M

OR

11. B). Draw and explain Bath – Tub curve with a suitable example.   10M

12. A). i) Explain the reliability evaluation of Parallel system with an example.   5M
ii) In the reliability logic diagram shown in Fig. 1. Out of components 4, 5, 6 at least two of the three must function for system success. Derive the expression for reliability of the system and hence find the reliability index of the system if each component has a probability of success of 0.9   5M

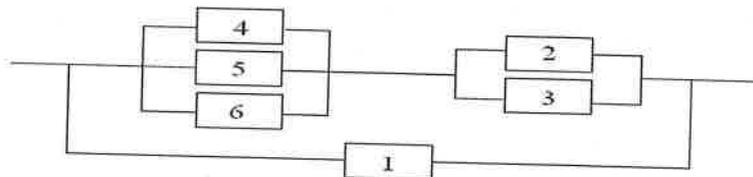

Fig. 1

OR

12. B). Describe Path Based method for Reliability analysis of Complex System with an example.   10M

(P.T.O..)

13. A). Explain exponential distribution and derive the expressions for MTTF of 2-component parallel system. 10M

OR

13. B). i) Tabulate the relationship between $f(t)$, $F(t)$, $R(t)$ and $h(t)$. 5M
ii) Explain the reliability evaluation of Series system with exponential distribution. 5M

14. A). Explain Stochastic Transitional Probability Matrix. 10M

OR

14. B). Define absorbing State. Consider a Markov chain, with two states, having Stochastic Transitional Probability Matrix of 10M

$$P= \begin{bmatrix} 0.6 & 0.4 \\ 0.3 & 0.7 \end{bmatrix}$$

(i) Construct the state space diagram (ii) Evaluate the limiting state probabilities.

15. A). With an example illustrate Network Reduction technique for Approximate System Reliability Evaluation of Series-Parallel System. 10M

OR

15. B). Derive the expressions for basic probability indices of Series system. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Regular/Supplementary Examinations November-2024
Course Name: Flexible AC Transmission System Devices
(Electrical & Electronics Engineering)

Date: 03.12.2024 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. Write down the advantages of FACTS.　2 M
2. What is the importance of transmission interconnections?　2 M
3. How would you compare VSC and CSC?　2 M
4. Draw the basic circuit of current source converter.　2 M
5. Mention the objectives of shunt compensation.　2 M
6. Define transient stability.　2 M
7. What is SVC? What are its applications?　2 M
8. Define the basic comparison of the STATCOM and SVC.　2 M
9. List out transient stability improvement methods.　2 M
10. Write the objective of TSSC in power system.　2 M

PART-B
Answer the following. Each question carries TEN Marks.

5x10=50M

11.A). What limits the loading capability? Explain different types of stability issues that limit transmission capability.　10M

OR

11. B). Discuss the various types of FACTS controllers.　10M

12. A). Explain the operation of three phase full wave bridge converter with circuit diagram and waveforms.　10M

OR

12. B). Illustrate the merits and demerits of voltage source converter with compared to current source converter.　10M

13. A). Explain voltage regulation with midpoint segmentation and also prevention of voltage stability with the help of end of line voltage support.　10M

OR

13. B). Explain basic operation of Thyristor Switched Capacitor with necessary waveforms.　10M

14. A). Discuss the "Regulation slope" characteristics of Static Var Compensators.　10M

OR

14. B). Describe the performance of VSC based STATCOM.　10M

15. A). Mention the objectives of series compensation. Explain the concept of series capacitive compensation.　10M

OR

15. B). Explain the operation of Thyristor Controlled Series Capacitor with neat diagram.　10M

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