F 6585

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

ADVANCED POWER ELECTRONIC SYSTEMS (Elective – II) (E)

(Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer **all** questions.*

Each question carries 4 marks.

1. What are the four basic types of switching mode regulators ?

2. What are the advantages and disadvantages of CUK converter ?

3. What are the types of power supplies in general ? Give brief explanation.

4. What are the commonly used control methods for power supplies ?

5. Briefly explain the differences between series and parallel resonant converters.

6. What do you mean by resonant switch ? List the favourable features over the PWM switches.

7. What are the various PWM techniques for inverters ?

8. What are the various current mode control schemes for PWM inverters ?

9. Define Displacement factor and Distortion factor.

10. What is a UPS ? What are the different topologies ?

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. With power circuit diagram and relevant waveforms explain the operation of a Boost Regulator. Explain continuous and discontinuous current modes.

Or

12. Explain the PWM method of control of dc-dc converters. Derive the output voltage equation for full bridge converter with bipolar switching.

13. With basic block schematic explain the principle of SMPS. What are the isolated d.c.–d.c. topologies ? Explain briefly.

Or

Turn over

14. With necessary diagram explain voltage mode and current mode controlled flyback regulator.

15. With necessary circuit diagrams and waveforms explain the operation of half bridge Resonant Inverter with bidirectional switches. Derive the voltages and currents in the converter.

Or

16. Explain the principle of zero voltage and zero current switching. Compare the performance of 2 CS and 2 VS.

17. Explain why a PWM inverter is superior to a square wave inverter. Briefly explain bipolar and unipolar PWM full-bridge inverters.

Or

18. Describe with block diagrams tolerance band and fixed frequency current mode control schemes for PWM inverters.

19. Explain the principle of input line current shaping using boost rectifiers. Discuss the improvement in power factor.

Or

20. (a) Describe with block schematics the principle of an Electronic ballast.

    (b) Describe with block diagram off-line interactive UPS.

(5 × 12 = 60 marks)

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Reg. No............................

Name..............................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

ADVANCED POWER SYSTEMS (Elective II) [E]

(Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Draw the schematic diagram of load frequency and excitation voltage regulators of a turbo generator.

2. Discuss about proportional plus integral load frequency control.

3. Explain about start up cost.

4. What are the assumptions made in the dynamic programming approach ?

5. Explain the gradient method for hydrothermal scheduling.

6. What is meant by hydrothermal co-ordination ?

7. What are the advantages of interconnected systems ?

8. Explain about inadvertent power exchange.

9. What is meant by cascading outage ?

10. Discuss about power system security.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. Explain in detail about the turbine speed governing system.

Or

12. Explain in detail about the dynamic response of a generator load model.

13. Explain in detail about the constraints in unit commitment.

Or

14. Explain unit commitment using priority list.

Turn over

15. Analyse the short term hydroscheduling by a gradient approach.

Or

16. Explain the dynamic programming solution to the hydrothermal scheduling problem.

17. Write short notes on :

    (a) Allocating pool savings.   (6 marks)

    (b) Advantages of energy broker system.   (6 marks)

Or

18. Explain about the types of interchange.

19. Explain in detail about the kinds of problem arise in a network using a six bus network.

Or

20. Discuss about the calculation of network sensitivity factor.

                                              (5 × 12 = 60 marks)

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Name..................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

VLSI TECHNOLOGY (Elective III) [E]

(Supplementary)

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 marks.

1. Write a note on crystal shaping in IC fabrication.

2. Discuss Fick's laws of diffusion.

3. Write a note on junction isolation.

4. Discuss the use of buried layer in BJT fabrication.

5. Write a note on latchup in CMOS.

6. Write a note on the features of BiCMOS technology.

7. Discuss the need for BiCMOS circuits.

8. Write a note on data paths.

9. Compare CMOS technology and GaAs technology.

10. Draw the crystal structure of GaAS.

$(10 \times 4 = 40 \text{ marks})$

Part B

Each question carries 12 marks.

11. (a) With the help of a neat sketch, discuss ion implantation. What are its advantages ?

Or

(b) Explain (i) MBE ; (ii) Metallization. $(5 + 7 = 12 \text{ marks})$

12. (a) Explain the fabrication of Monolithic capacitors, with the aid of neat sketches.

Or

(b) Explain the methods adopted to control V_{TH} of a MOSFET.

Turn over

13. (a) Explain the n-well process for CMOS IC fabrication.

Or

(b) (i) Write a note on constant voltage scaling. (7 marks)

(ii) Give the design rules for vias. (5 marks)

14. (a) Draw the circuit and layout of a 2 input NOR gate.

Or

(b) Draw the BiCMOS NAND gate circuit with PUP pull-up and PMOS pull up and explain.

15. (a) Explain the design issues in submission CMOS IC design.

Or

(b) Explain the fabrication steps in GaAs technology.

[5 × 12 = 60 marks]

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Reg. No.....................................

Name....................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

DIGITAL PROTECTION OF POWER SYSTEMS (Elective III) [E]

(Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 4 marks.

1. Classify the protective relays.

2. What is the function of instrument transformer in a protection circuit ?

3. How to simulate a current transference ?

4. Discuss the computer applications to protective relaying.

5. Compare offline and online applications of computer.

6. What is the function of status flag ?

7. What are the advantages of microprocessor based protective relay ?

8. What is meant by stack pointer ?

9. Draw the flowchart for measurement of R and X.

10. What is meant by Mho relay ?

(10 × 4 = 40 marks)

Part B

Answer all questions.
Each question carries 12 marks.

11. Explain the operation of sample and hold circuit.

Or

12. Classify the protective relays based on function and discuss the various causes of fault.

13. Briefly explain about the simulation of power system disturbance.

Or

14. Discuss how to simulate the distance relay during transient condition.

Turn over

15. Explain the online applications of computer.

Or

16. Explain the need and nature of protection in power system.

17. Briefly discuss about the protection of alternators against loss of excitation.

Or

18. Explain the measurement of power system signals through PLL interface.

19. Explain the operation of microprocessor based over current relay.

Or

20. Describe the realisation of mho relay using microprocessor.

(5 × 12 = 60 marks)