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| 6E7141 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E7141 | |
| | B.Tech. VI Sem. (Main) Examination, July - 2023 Electrical Engineering 6EE3-01 Computer Architecture EE, EX | |

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions From Part A, five Questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagram must be shown wherever necessary. Any data you feel missing suitably be assumed and states clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. What is Data Type?
2. What do you mean by instruction?
3. Differentiate between statics and dynamic memory.
4. What do you mean by memory management unit?
5. Define PCI express bus. What is the data transfer rate of PCI bus.
6. What is Arbitration?
7. Define a bus interface unit (BIU) and execution unit(EU).
8. How pipeline processing is done in an instruction pipeline.
9. What is MIPS processor?
10. Write the limitation of ILP.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions.

(5×4=20)

1. Describe the von-neumann model and explain the functioning of its components.
2. Explain Booth multiplication algorithm and its hardware.

3. What is need of virtual memory in the computer System? Explain how the page map table is organized in virtual memory system.
4. Draw and explain the diagram of a DMA controller.
5. Define programming model. Explain 80×86 architecture.
6. Describe the operations in the instruction set.
7. Explain the SOC architecture in detail.

PART - C

(Descriptive/Analytical/Problem solving/Design Questions)

Attempt any Three questions.

(3×10=30)

1. Define control unit. Explain different types of control unit.
 2. What are the various mapping methods used with cache memory organization? Explain types of cache memory and explain any one method in detail.
 3. What is port? Explain parallel and serial port in detail.
 4. Explain various types of addressing modes of 80×86 with example.
 5. Write short notes on:
 - a) Dynamic scheduling.
 - b) VLIW Architecture.
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| 6E1571 | Roll No. _____ | [Total No. of Pages : 2] |
| <div style="border: 1px solid black; display: inline-block; padding: 5px; margin: 0 auto; width: 100px;">6E1571</div> <p style="margin: 10px 0;">B.Tech. VI Sem. (Back) Examination, July - 2023</p> <p style="margin: 0 0 10px 0;">Electrical Engineering</p> <p style="margin: 0 0 10px 0;">6EE3-01 Computer Architecture</p> <p style="margin: 0 0 10px 0;">EE, EX</p> | | |

Time : 2 Hours

Maximum Marks : 80

Min. Passing Marks : 28

Instructions to Candidates:

Attempt ALL Five questions from Part A, Four questions out of Six questions from Part B and Two questions out of Three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

1. Define RISC.
2. What is PCI Express Bus?
3. What are Registers in Microprocessors?
4. What is Pipelining?
5. Explain System Bus. (5×2=10)

PART - B

Attempt any **FOUR**.

1. Explain the hardware implementation of CPU with Micro instruction.
2. What is DMA? Explain DMA Controller in detail.
3. Explain various types of Interrupts and Interrupt Controller.
4. Explain I/O Addressing in 80×86.
5. Write short note on Instruction Level Pipelining (ILP) in detail and also explain compiler techniques for ILP.
6. Explain following in detail:
 - a) Dynamic Scheduling.
 - b) Branch Cost and Branch Prediction. (4×10=40)

PART - C

Attempt any **TWO**.

1. Explain the Architecture and functions of General Computer System along with Data types and Integer also differentiate RISC and CISC.
2. Explain Memory Hierarchy in detail with its types and uses also explain the role of memory unit in the function and working of computer organization.
3. Explain following types of Architecture.
 - a) VLIW Architecture. (5)
 - b) DSP Architecture. (5)
 - c) SOC Architecture. (5)

(2×15=30)

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| 6E7142 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E7142 | |
| | B.Tech. VI - Sem. (Main) Examination, July - 2023 Electrical Engineering 6EE4-02 Power System - II EE, EX | |

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. Explain the challenges associated with Bus admittance matrix.
2. Give similarity between NR and GS method.
3. Provide utility of equal area criterion.
4. Explain three phase fault.
5. Give application of Droop control.
6. What do you mean by VAR?
7. Give advantages of retail competition.
8. What do you mean by emergency control?
9. What is Whole sale competition?
10. What do you mean by ancillary services?

PART - B

(Analytical/Problem solving questions)

Attempt any **five** questions

(5×4=20)

1. Give scope and outcome of the course (power system - II).
2. Explain computational issues in large - scale power systems.
3. Explain the concept of impact of stability constraints on power system operation.
4. Describe the working of turbine and speed governors for controlling frequency and voltages.
5. Explain the working of phasor measurement units.
6. Explain the concept of whole - sale competition and retail competition.
7. Explain the mechanism deployed during extremis states of a power system.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any **Three** questions

(3×10=30)

1. By help of suitable example explain how a bus admittance matrix is form? Also explain the real power balance equation of the nodes.
 2. Explain swing equations of a synchronous machine connected to an infinite bus and power angle curve.
 3. Explain the concept frequency dependence of loads, Droop control and power sharing.
 4. With reference to energy control centre functions explain the working of SCADA system.
 5. By help of suitable example explain the concept of generator cost curves, utility functions, power exchanges, demand side management also provide their advantages and challenges?
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| 6E1572 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E1572 | |
| | B.Tech. VI Sem. (Back) Examination, July - 2023 Electrical Engineering 6EE4-02 Power System - II EE, EX | |

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. Give application of Gauss Seidel methods.
2. Give difference between Gauss seidel and Newton Rapson methods.
3. Give utilization of power angel curve.
4. What are challenges associated with equal area criterion methods?
5. What do you mean by power sharing?
6. Give application of Static VAR compensator.
7. Explain cause of generation of reactive power.
8. Explain difference between Alert and Emergency states.
9. Who are power purchasing agency?
10. What do you understand by Ancillary services?

PART - B

(Analytical/Problem solving questions)

Attempt any **Five** questions.

(5×8=40)

1. Give the objective, scope and outcome of this course (Power System - II).
2. Give real and reactive power balance equations at a node.
3. Explain effect of series compensation of transmission lines on stability.
4. By help of neat diagram explain the working model of tap changing transformers.
5. Explain preventive control and emergency control.
6. Explain the working of STATCOM.
7. Describe the basic price principles in detail.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any **Four** questions.

(4×15=60)

1. Give a review of the structure of a power system and its components. Also provide analysis of power flows : Formation of Bus Admittance Matrix.
 2. Explain swing equations of a synchronous machine connected to an infinite bus and power angle curve.
 3. Explain the concept of power flow control using embedded dc links and role of phase shifters.
 4. With reference to energy control centre functions explain the working of SCADA system.
 5. By help of suitable example explain the concept of Generator cost curves, Utility functions, power exchanges, spot pricing also provide their advantages and challenges.
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6E6072

Total No. of Questions:

Total No. of Pages:

Roll No. _____

B.Tech. VI-Sem (Back) Exam 2023
Electrical Engineering
6EE2A High Voltage Engineering
6E6072

Time: 3 Hours

Maximum Marks: 80
Min Passing Marks: 24

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

UNIT -I

- Q. 1 a. Briefly explain the cavity breakdown.
 b. What is treeing & tracking breakdown?

OR

- Q.1 a. Describe the electromechanical breakdown in solids.
 b. Discuss the applications of gases in power system.

UNIT -II

- Q. 2 a. With suitable circuit diagram explain Mark's multistage impulse generator.
 b. Clarify the construction and operation of Sphere gap.

OR

- Q.2 a. What is Klydonograph?
 b. Discuss the Cascaded Transformers with suitable circuitry.

UNIT -III

- Q. 3 Explain basic wide-band and narrow band PD detection circuits in detail.

OR

- Q.3 a. Describe the partial discharge.

- b. What do you mean dielectric constant and loss factor?

UNIT -IV

- Q. 4 a. What are the different causes of over voltages?
b. Discuss attenuation of traveling waves in detail.

OR

- Q.4 Describe the travelling waves on open end line, short circuited line transmission lines.

UNIT -V

- Q. 5 a. Draw the Volt-time curves and discuss it.
b. Explain the coordination of insulation levels.

OR

- Q.5 a. Describe the arcing horn with suitable diagram.
b. Write a short note on expulsion type lightning arresters.

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| 6E7143 | Roll No. _____ | [Total No. of Pages : 3] |
| <div style="border: 1px solid black; display: inline-block; padding: 5px 15px; margin: 0 auto; width: 150px;">6E7143</div> <p style="margin: 10px 0;">B.Tech. VI - Sem. (Main) Examination, July - 2023</p> <p style="margin: 0 0 10px 0;">Electrical Engineering</p> <p style="margin: 0 0 10px 0;">Power System Protection 6EE4-03</p> <p style="margin: 0 0 10px 0;">EE, EX</p> | | |

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. What do you mean by Zone of Protection?
2. Why back-up protection is needed?
3. What are the advantages of high speed protection?
4. What do you mean by loss of selectivity between two over-current relays in adjoining line sections?
5. What are the situations where directional relays must be used?
6. What do you mean by CT saturation?
7. What are the drawbacks of the simple differential scheme?
8. Explain the Phenomenon of inrush current.
9. Why does a busbar differential scheme have a tendency to operate for external faults?
10. What do you mean by Power swing?

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions.

(5×4=20)

1. How many distance measuring units will be required for the complete three-stepped protection of a transmission line section in case of (i) a single-fed system and (ii) a double end-fed system.
2. How do different distance relays perform with respect to their behaviour on load, effect of arc resistance on the reach and response to power swing?
3. What are the typical values of percentage bias used for generator protection? How does this setting compared with that of similar protection for transformer?
4. Discuss the effect of Power Swings distance relay.
5. Explain how WAMS are used improving protection system.
6. Explain with suitable diagram, how Definite Time over-current(DTOC) relays are used for protection of a distribution feeder.
7. The pressure coil of a directional relay has an impedance of $(100+j274.74)$ Ohms. What is the maximum torque angle (MTA) for this relay.

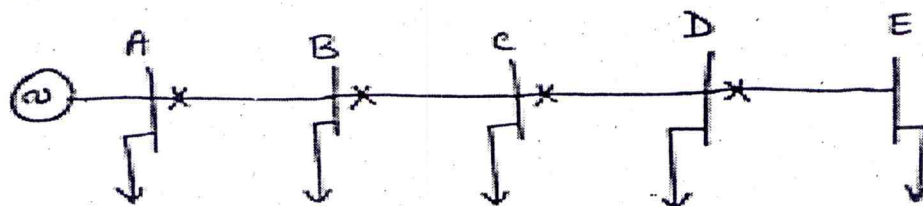
PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions.

(3×10=30)

1. For a 45 MVA, 11KV/66KV, Star-delta transformer, design the percentage differential scheme. What is the minimum recommended percentage bias?
2. For the system shown in figure Q2, design the complete over-current protection using the IDMT relays. Thus, decide the CT ratios, the plug settings and the TMS at all locations.



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|-----------------------|--------|--------|--------|--------|--------|
| Load | 115 A | 80 A | 100 A | 77 A | 70 A |
| Minimum fault current | 1500 A | 1000 A | 780 A | 585 A | 390 A |
| Maximum fault current | 6000 A | 5000 A | 3000 A | 2000 A | 1000 A |

3. State and explain Shannon's sampling theorem. Also explain the Phenomenon of aliasing with suitable diagrams.

4. Draw an equivalent Circuit diagram of CT and explain the ratio error and phase angle error with the help of suitable phasor diagrams.
 5. Write a short note on :
 - a) Out-of-step Protection.
 - b) Wide-Area Measurement Systems(WAMS).
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6E1573

Total No. of Questions:

Total No. of Pages:

Roll No. _____

B.Tech. VI Sem(Back) Exam 2023
Electrical Engg.
6EX4-03 Power System Protection
6E1573
EE, EX

Time: 3 Hours

Maximum Marks: 120
Min. Passing Marks: 42

Attempt all ten questions from Part A, five question out of seven from Part B and four questions out of five from Part C.

Part A (Answer should be given up to 25 words only)
All questions are compulsory

1. What do you mean by Over-Current Protection?
2. What is Under-frequency relay?
3. Why Circuit Breakers are use?
4. What do you mean by relay coordination?
5. Explain different type of Instrument transformers.
6. What do you mean by Sampling?
7. What do you understand by Relay Testing?
8. What is under-voltage relay?
9. Where Relays are used?
10. What is Synchro-phasors?

10 x 2=20

Part B (Analytical/Problem solving questions)
Attempt any Five questions

1. Explain Generator protection scheme in detail.
2. Discuss Bus bar Protection and its arrangement.
3. Describe the effect of Power Swings on Distance Relaying.
4. Briefly explain the Simulation of transients using Electro-Magnetic Transients (EMT) programs in detail.
5. Effectively discuss the transformer protection scheme.
6. Describe the Out-of- step protection.
7. What are the applications of WAMS for improving protection systems?

5 x 8 =40

Part C (Descriptive/Analytical/Problem Solving/Design questions)
Attempt any four questions

1. Explain Overcurrent Protection and overcurrent relay co-ordination in detail.
2. Differentiate the Directional, Distance and Differential protection schemes.
3. Describe the Computer-aided protection in detail by taking suitable examples.
4. Describe the Modeling and Simulation of different Protection Schemes.
5. Write short note on Phasor Measurement Units and Wide-Area Measurement Systems (WAMS).

4 x 15=60

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| 6E6073 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E6073 | |
| | B.Tech. VI- Sem. (Main & Back) Examination, July- 2023 Electrical Engineering 6EE3A Switchgear and Protection EE, EX | |

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt all **Five questions**, selecting **One question** from **each unit**. All questions carry **equal marks**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205).

UNIT - I

1. a) What is a static Relay? Explain its merits and demerits specially with electromagnetic Relay? (8)
- b) Discuss how Rectifier bridges are utilized in amplitude comparator circuit. (8)

(OR)

1. a) Explain working phenomins of directional overcurrent relays. (8)
- b) Explain Duality between amplitude and phase comparators. (8)

UNIT - II

2. a) Explain by help of neat diagram about static differential protection of generator. (8)
- b) Explain working of a static mho relay. (8)

(OR)

2. a) Explain briefly working process of static impedance relay. (8)
- b) Describe by help of diagram the protection scheme of a single phase transformer using static relay. (8)

UNIT - III

3. a) Describe briefly the effect of power swings on the performance of distance protection. (8)
b) Explain carrier assisted distance protection. (8)

(OR)

3. a) Explain working phenomenon of mho relay with blinders. (8)
b) Explain principle of operation of directional comparison. (8)

UNIT - IV

4. a) The following data relate to a 50 Hz generator e.m.f. to neutral = 7.5 kV (rms).
Reactance of generator and connected system = 5Ω
Distributed capacitance to neutral = $0.02\mu\text{f}$ (Resistance neglected) cal. the following.
i) Max voltage across the contacts of circuit breaker when it breaks a short circuit current at zero current.
ii) Frequency of the transient oscillation.
iii) Average rate of rise of voltage upto the first peak of the oscillation. (8)
b) Explain working of a miniature circuit breaker (MCB). (8)

(OR)

4. a) In a short circuit test on 132 kv 3-d system, the breaker give the following result
Power factor of the fault = 0.45
Recovery voltage = 0.9 time of full line voltage. The breaking current is symmetrical. The restriking transient has a natural frequency of 15 kHz
Cal the rate of rise of restriking voltage (RRRV) in the following types of faults.
i) Grounded fault
ii) Under grounded fault (8)
b) Explain working of a Air circuit breakers. (8)

UNIT - V

5. a) Explain working phenomenon of SF_6 circuit breakers. (8)
b) Describe briefly the concept of transmission line distance protections. (8)

(OR)

5. Write short note on: (8+8=16)
a) Digital Protection
b) Selection of circuit breakers

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| 6E7144 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E7144 | |
| | B.Tech. VI Sem. (Main) Examination, July - 2023 Electrical Engineering 6EE4-04 Electrical Energy Conversion and Auditing | |

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. How climate change effect energy scenario.
2. List of the advantages of energy security.
3. What are the factors that affecting electricity tariff.
4. What is thermal energy contents of fuel.
5. Mention various bench marking.
6. Give the purpose of providing energy audit instruments.
7. What are the different types methods found in energy efficiency.
8. Write short notes on wind systems.
9. Define specific electronic ballast.
10. Explain energy efficient lighting controls.

PART - B

(Analytical/Problem solving questions)

Attempt any **Five** questions.

(5×4=20)

1. State and explain power factor improvement methods.
2. Derive the expression for losses in induction motors.
3. Explain the real and reactive power regulation.
4. State and explain energy efficient transformers.
5. What is tendency of power system interconnection in the world.
6. Explain soft starters with energy saver.
7. What are the moist air and humidity.

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any **Three** questions.

(3×10=30)

1. Explain the commercial and Non - commercial energy.
 2. What do you understand by energy management and audit.
 3. Explain different approaches used in energy efficient technologies in electrical systems.
 4. Write in detail energy saving opportunities with energy efficient motors.
 5. Explain the methods of improving the energy strategy for the future.
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6E1574

Roll No. _____

[Total No. of Pages : 2]

6E1574

B.Tech. VI Sem. (Back) Examination, July - 2023
Electrical Engineering
6EE4-04 Electrical Energy Conversion and Auditing

Time : 3 Hours

Maximum Marks : 120
Min. Passing Marks : 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and Four questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. Define energy audit.
2. What is the energy needs of growing economy.
3. Define energy substitution.
4. What is maximum demand control? Why it needed?
5. Define voltage and frequency operating limits.
6. What is power quality issues.
7. Enlist the optimizing the input energy requirements.
8. Define solar PV and wind farm behavior.
9. How occupancy sensors is measured?
10. What is the limitation of automatic power factor controllers.

PART - B

(Analytical/Problem solving questions)

Attempt any **Five** questions.

(5×8=40)

1. What is overview of grid code technical requirements?
2. Write down thermal basics - fuels.
3. Explain energy audit approach understanding energy costs.
4. Explain automatic power factor controllers.
5. What is optimizing the input energy requirements? Explain.
6. Explain losses in induction motors.
7. Draw and describe energy scenario.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any **Four** questions.

(4×15=60)

1. Explain distribution and transformers losses in electrical systems.
 2. What do you understand by electricity billing, describe in details.
 3. What are the advantages of energy conservation, explain energy conservation act - 2001 and its features.
 4. Discuss basics of energy and its various forms.
 5. Describe the energy efficient in industrial systems.
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6E6074

Total No. of Questions:

Total No. of Pages: 2

Roll No. _____

B.Tech. VI-Sem (Back) Exam 2023
Electrical & Electronics Engg.
6EX4A Advanced Power Electronics
EE, EX
6E6074

Time: 3 Hours

Maximum Marks: 80

Min Passing Marks: 26

Attempt any **five** questions, selecting **one** question from **each** unit. All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.
 (Mentioned in form No.205)

1. _____

2. _____

UNIT -I

Q. 1 Draw the circuit of a single-phase half wave rectifier feeding a resistive load. Also derive the expression for various performance indices.

OR

16

Q. 1 Draw & explain the circuit of a single phase fully controlled converter. In what aspects is the operation of this circuit different for resistive load, R-L load & R-L-E load.

UNIT -II

16

Q. 2 Describe the basic principle of operation with required wave forms of a three-phase to three-phase and three-phase to single phase cyclo-converters

OR

16

Q.2 What is meant by cyclo-converters? Derive the output equation for control circuit.

UNIT -III

16

Q. 3 (a) Draw a diagram & discuss the operation of series inverter. Derive an equation for this circuit.
 (b) What is current source inverter. Describe the working principle of single-phase current source inverter.

OR

16

Q.3 (a) Elaborate the detail classification of inverters.

(b) How we can remove the drawbacks of series inverter? Discuss with the help of diagrams.

UNIT -IV

16

Q. 4 Draw & explain the working of class E resonant inverter. Describe the meaning of unidirectional switches in inverters.

16

43

Q.4 Explain the following:

- (a) L-type and M-type ZCS resonant converter
- (b) ZVS resonant converter

OR

UNIT -V

16

Q. 5 (a) What is a switching regulator?

- (b) How it is classified? Explain the function of each class.

OR

16

Q.5 Write short note on following:

- (1) UPS
- (2) AC Power Supplies
- (3) Fly back converters
- (4) DC Power Supplies

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| 6E7145 | Roll No. _____ | [Total No. of Pages : 2] |
| | <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">6E7145</div> | |
| | B.Tech. VI - Sem. (Main) Examination, July - 2023 Electrical Engineering 6EE4-05 Electric Drives EE,EX | |

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A**(Answer should be given up to 25 words only)****All questions are compulsory.****(10×2=20)**

1. Give the concept of electric drive.
2. Explain how speed of a d.c. motor can be controlled by varying armature terminal voltage.
3. What do you understand by 'smooth starting' of d.c. motor?
4. What do you understand by regenerative braking?
5. Give the merits of ac drives with respect to dc drives.
6. Induction motor speed control with constant supply voltage and reduced - supply frequency is rarely used in practice. Justify this statement.
7. Discuss how volts/hertz control for a 3-phase induction motor is similar to armature - voltage control of a dc motor.
8. What do you understand by slip power recovery?
9. Why speed of induction motor drops with loading?
10. Mention the limitations of ac drives.

PART - B**(Analytical/Problem solving questions)****Attempt any Five questions.****(5×4=20)**

1. Draw and explain the characteristics of a d.c. series motor.
2. What do you under by the concept of flux weakening of d.c motor for high speed operation?

3. A dc chopper is used for regenerative braking of a separately - excited dc motor. The dc supply voltage is 400 V. The motor has $r_a = 0.2 \Omega$, $k_m = 1.2 \text{ V-s/rad}$. The average armature current during regenerative braking is kept constant at 300 A with negligible ripple. For a duty cycle of 60% for a chopper, determine power returned to the dc supply.
4. Describe how a four - quadrant drive can be obtained from a chopper - fed separately excited dc motor.
5. Describe stator frequency control for the speed control of a 3-phase induction motor.
6. A 400 V, 4-pole, 50 Hz, 3-phase, star - connected induction motor has $r_1 = 0$, $x_1 = x_2 = 1\Omega$, $r_2 = 0.4 \Omega$, $X_m = 50 \Omega$, all referred to stator side. This induction motor is fed from a constant - voltage source of 231 V per phase. Calculate the slip for maximum torque.
7. Explain the operation of static kramer drive.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions.

(3×10=30)

1. A 220 V, 1500 rpm, 10 A separately - excited dc motor has an armature resistance of 1 ohm. It is fed from a single - phase fully controlled bridge rectifier with an ac source voltage of 230 V, 50 Hz. Assuming continuous load current, compute motor speed at the firing angle of 30° and torque of 5 Nm.
2. A 3-phase, 400 V, 50 Hz, 960 rpm, star - connected SRIM has the following per phase parameters referred to stator.
 $r_1 = 0.1 \Omega$, $r_2 = 0.08 \Omega$, $x_1 = x_2 = 0.3 \Omega$, $X_m = 0$. per phase turn ratio from rotor to stator = 0.7. Speed of this motor is controlled by a GTO chopper in its rotor circuit. For a speed of 800 rpm, the inductor current is 110A and the chopper resistance is 2Ω . Calculate
 - a. The value of chopper duty cycle.
 - b. The input power factor.
3. Explain the working of :
 - a. DC link static scherbius drive and
 - b. Cycloconverter static scherbius drive.
4. A 230V dc source is connected to a separately excited dc motor through a chopper operating at 500 Hz. The load torque at 1200 rpm is 32.5 Nm. The motor has $r_a = 0$, $L_a = 2\text{mH}$ and $K_m = 1.3 \text{ Vs/rad}$. Motor and chopper losses are neglected. Calculate the minimum and maximum values of armature current and the armature current excursion.
5. Explain volts/hertz control for a 3-phase induction motor for its speed control. Enumerate its advantages. Describe at least two inverter circuits used for volts/hertz control.

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| 6E1575 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E1575 | |
| | B.Tech. VI- Sem. (Back) Examination, July- 2023 | |
| | Electrical & Electronics Engineering 6EX4-05 Electric Drives EE,EX | |

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

(10×2=20)

1. What is regenerative braking in separately excited DC motor?
2. What is meant by flux weakening in DC motors for high speed operation?
3. Define slip regulation.
4. Draw the control structure of the inner current loop of DC drive.
5. What is meant by V/f control?.
6. List the application of chopper fed DC drive.
7. What are the main parts of electric drive? Draw the block diagram.
8. What are the advantages of rotor resistance control?
9. What happens when the motor load increases in the induction machine?
10. Mention the factors affecting the speed of a DC motor.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions

(5×8=40)

1. Explain the flux control method of speed control for DC shunt motors.
2. A 250V shunt motor on no load runs at 1000 r.p.m. and takes 5A. The total armature and shunt field resistance are respectively 0.2Ω and 250Ω . Calculate the speed when loaded and taking a current of 50A, if the armature reaction weakens the field by 3%.
3. Explain the speed torque characteristic of 3 phase induction motor with a neat diagram.
4. Describe four quadrant motoring and braking zones of DC machines.
5. Explain the design of current controller with block diagram.
6. Draw and explain the equivalent circuit of the induction motor.
7. Explain the principle of sinusoidal pulse width modulation.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Four questions

(4×15=60)

1. Explain the power electronic based rotor side control of slip ring induction motor.
2. Derive the steady state analysis expression for chopper control DC drive.
3. Explain the 3 phase voltage source inverter for induction motor with neat sketch.
4. What are the speed control methods of DC motor? Explain the armature voltage control method of a separately excited DC machine.
5. The power input to the rotor of 440 V, 50 Hz, 6-pole, 3 phase induction motor is 80kw. The rotor emf is observed to make 100 complete alternations per min. Calculate (a) the slip; (b) the rotor speed; (c) the mechanical power developed; (d) the rotor copper loss per phase; (e) the rotor resistance per phase if the rotor current is 65A.

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| 6E7146 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E7146 | |
| | B.Tech. VI-Sem. (Main) Examination; July - 2023 Electrical Engg. 6EE5-11 Power System Planning(EI.-II) | |

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

(10×2=20)

1. Explain the Capacity Expansion in Generation Planning.
2. What do you mean by Electricity Regulation?
3. Write the objectives of Generation Planning.
4. Explain the wheeling with respect to demand side planning.
5. Describe the interruption indices in brief.
6. Write the objectives of Transmission Planning.
7. Explain the financial planning in brief.
8. What do you understand by greenhouse effect?
9. What are the disadvantages of long term forecasting?
10. Enumerate the cyclical components of Planning.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions

(5×4=20)

1. Explain the power system planning and the planning process in detail.
2. Explain the integrated resources planning with respect to power generation planning.
3. Explain the difference between National and Regional Planning.
4. Explain Optimal power system expansion planning. Summarize main steps of optimal power system planning.
5. Explain system adequacy and security of power system reliability.
6. Write short notes on operating and maintenance cost of any candidate plant.
7. What are the technological impacts of greenhouse effect?

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions

(3×10=30)

1. Explain the quality of supply for power system planning.
 2. Explain electricity forecasting schemes and write the advantages of short term forecasting. Discuss various planning tools.
 3. Explain the strategy for transmission expansion in power system.
 4. What is Insulation Coordination? Explain in detail.
 5. Write short notes on :
 - a) Computer aided planning.
 - b) Least cost optimization problem for thermal plant.
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6E7148

Roll No. _____

[Total No. of Pages : 2]

6E7148

B.Tech. VI-Sem. (Main) Examination, July- 2023
Electrical Engineering
6EE5-13 Electrical and Hybrid Vehicles (EL-II)

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

(10 × 2 = 20)

1. Explain the basic fueling difference between Conventional and Hybrid Electrical Vehicles?
2. Give an application of Electric Propulsion unit in electric train?
3. What is uses of control switch in electrical trains?
4. What do you mean by sizing in propulsion motor?
5. What is a Fuel Cell?
6. Give engineering application of BEV?
7. Explain what is requirement of energy management strategies?
8. Explain need of fuel efficiency analysis in hybrid electrical vehicles?
9. Give an application of permanent magnet motor in electric drive?
10. Explain how energy storage system work in ICE?

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions.

(5×4 = 20)

1. Give scope and outcome of this course?
2. Explain impact of modern drive trains on energy supplies?
3. Explain the power flow control in electric drive-train topologies?
4. By help of suitable diagram and example explain the "Communication" process?
5. Explain the implementation issues of energy management strategies?
6. Explain the fuel cell base energy storage system?
7. Describe the Configuration and control of DC Motor drives in electrical trains?

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any Three questions.

(3×10= 30)

1. By help of suitable example and concepts explain the difference between conventional vehicles, hybrid vehicles and electrical trains?
 2. Explain the concept of energy storage system further explain the design of a hybrid vehicle with energy storage system?
 3. By help of suitable design explain basic concept of electric traction and introduction to various electric drive train topologies?
 4. Design a conventional vehicle and explain its power source and transmission characteristics?
 5. Explain energy management strategies used for hybrid and electrical vehicles by help of classification of different energy management strategies and comparison of different energy management strategies?
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| 6E1576 | Roll No. _____ | [Total No. of Pages : 2] |
| | 6E1576 | |
| | B.Tech. VI-Sem. (Back) Examination, July - 2023 Electrical Engineering 6EE5-11 Power System Planning | |

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. Draw detailed structure of power system and label all the different voltage levels from generation to consumer end. (2)
2. What is the role of wheeling in demand side planning? (2)
3. Define reliability indices. Name any 3 generation reliability indices. (2)
4. What is green house effect? Write down any two effect of green house gases on earth environment. (2)
5. Mention two technique of disaster management in power system. (2)
6. Name any two methods to increase the reliability of transmission system. (2)
7. Define : i) Loss of load probability (LOLP)
 ii) Outage Rate (1+1)
8. Enlist different types of reactive power compensation in power system. (2)
9. Differentiate between long term and short term load fore casting. (2)
10. List out different planning tools used in power planning. (2)

PART - B
(Analytical/Problem solving questions)

Attempt any Five questions.

(5×8=40)

1. What is computer aided power system planning? Explain different software tools utilised in power system planning. (2+6)
2. What is wheeling? Briefly explain the concept of wheeling and wheeling changes in power system. (3+5)
3. What is integrated resource planning? Discuss any one practical integrated resource system with its two advantages over single resource system. (2+6)
4. Discuss the importance of process of obtaining data in reliability analysis of composite system. Explain the process briefly. (8)
5. Write short note on :
 - a) System and load point indices
 - b) Distribution reliability analysis. (4+4)
6. Explain radial network in power system. How network reconfiguration affect reliability of power system? (3+5)
7. Discuss load management and load prediction in power system. (4+4)

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Four questions.

(4×15=60)

1. Give salient features of various forecasting techniques. Which method of load forecasting would you suggest for short term and why? (5+10)
2. Discuss various reliability evaluation levels in power system. Explain briefly various indices used in generation reliability evaluation with required calculations. (5+10)
3. Explain national and regional power planning in India. Discuss salient features of electricity regulation in detail. (7+8)
4. What do you mean by generation planning? Write down various factors affecting generation planning. Also explain various aspects of reliability analysis of power system. (3+5+7)
5. Explain in brief the following : (5×3=15)
 - a) Technical impact of green house effect.
 - b) Factors affecting inter connection under emergency assistance in generation planning.
 - c) Planning tools in power planning.
 - d) Lateral distribution protection.
 - e) Shunt compensation and series compensation.

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| 6E1578 | Roll No. _____ | [Total No. of Pages : 2] |
| | <div style="border: 1px solid black; padding: 5px; display: inline-block;">6E1578</div> | |
| | B.Tech. VI- Sem. (Back) Examination, July - 2023 Electrical Engineering. 6EE5-13 Electrical and Hybrid Vehicles | |

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. Classify Hybrid Electric Vehicles.
2. Write the principle of Switched reluctance motor.
3. Write the assumptions necessary for the analysis of Permanent magnet motor drives.
4. What are the major components included in the Hybrid Vehicle system?
5. Mention the relation between torque and power in propulsion motors.
6. What is the need of efficient energy management strategy in electric hybrid vehicles?
7. Write any two disadvantages of plug in Electric vehicles.
8. What is the basic need of Electric vehicle?
9. Define gradeability. Also write its significance.
10. Write the main drawbacks of series hybrid electric vehicles.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions.

(5×8=40)

1. Discuss on different operational modes of Series Hybrid Electric Drive Train. Give a briefing on Regenerative Braking used in Electric Vehicles.
2. Write the basic classification of hybrid Electric vehicles? Illustrate the various transmission characteristics.
3. What is meant by transmission characteristics of a vehicle? Illustrate the power of flow control in hybrid electric drive train.
4. What is field orientation control in induction motor drives? Explain Emphasize the multi-quadrant control of chopper fed DC motor drives.
5. Draw and explain the block diagram of Switched reluctance motor drive system. Enumerate the classification of Electric motor drives for EHV applications.
6. Write the basic impact of modern drive trains on energy supplies and also discuss about the impact of hybrid vehicles on future energy resources.
7. Write a short note on sizing the power electronics to hybrid vehicles Enumerate the various communication technologies used in hybrid vehicles.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Four questions.

(4×15=60)

1. With a neat schematic and waveforms explain how to operate Induction motor in the field weakening region.
2. Discuss on different issues that may come across in the implementation of energy management strategies.
3. Enumerate the design considerations while sizing the components of hybrid drive trains.
4. Discuss on Vehicle to grid (V2G) and G2V fundamentals.
5.
 - a) Why a Gear system is needed for an ICE? Explain with relevant characteristic curves.
 - b) Explain the EV drivetrain alternatives based on power source configuration.