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Total No. of Questions : 22	**Total No. of Pages :** 04

6E7141

Roll No. : ....

6E7141

B.Tech. VI-Sem. (Main/Back) Exam. 2024

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 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. ....

PART-A   [10x2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1.   What is the role of Program Counter Register?

Q.2. What do you mean by word size for a Computer Machine?

Q.3. What do you mean by virtual memory?

Q.4. What do you mean by Data Hazards?

Q.5. What do you mean by Real mode addressing?

Q.6. What do you mean by Interrupt?

Q.7. Explain memory hierarchy in brief.

Q.8. Differentiate Parallel ports with Serial ports.

Q.9. What do you mean by memory management unit?

Q.10. What do you mean by Multilevel Bus Architecture?

PART-B   [5x4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1. Differentiate CISC vs. RISC.

Q.2. What is the significance of Control Unit? Explain.

Q.3. Differentiate hard wired control unit with microprogrammed control unit in detail.

Q.4. Why we use cache memory? Explain.

Q.5. Explain DSP Architecture in detail

Q.6. Explain Instruction level pipelining with suitable example.

Q.7. Explain various Addressing modes of 80×86 in detail.

PART-C [3x10=30]

(Descriptive/Analytical/Problem-Solving/Design questions)

Attempt any three questions

Q.1. What do you mean by pipelining? What are the challenges during implementation of it and explain solutions also.

Q.2. What do you mean by direct memory access? Explain DMA Controller in detail.

Q.3. (a) What is the role of Page Table? Explain with suitable example.

(b) Explain Microprogram sequencer in detail.

Q.4. Explain Instruction Set of 80×86 in detail

Q.5.

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6E7142

B.Tech. VI-Sem. (Main/Back) Exam. 2024

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)

1. ....   2. ....

PART-A   [10×2=20]

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

Q.1.   What is slack bus? What is its significance?

Q.2.   What is market equilibrium?

Q.3.   Define transient stability.

Q.4. What is the difference between state estimation and load flow problem?

Q.5. How power angle affects stability of power system?

Q.6. Define per unit inertia constant known as H constant.

Q.7. What are the advantages of GS method over NR method?

Q.8. What is automatic voltage control in power system?

Q.9. What is synchronizing power coefficient?

Q.10. Write down the benefits of deregulation of power industry.

PART-B   [5x4=20]

(Analytical/Problem-solving questions)

Attempt any five questions

Q.1. A loss-free generator supplied 50 MW to an infinite bus, the steady state limit of the system being 100MW. Determine whether the generator will remain in synchronism if the prime mover input is abruptly increased by 30 MW.

Q.2. What does system security means? Draw a diagram showing power system static security levels.

Q.3. How speed governing system of a steam turbine works? What are the different components used for this purpose? Draw a diagram showing arrangement of this system.

Q.4. Illustrate the comparison between Gauss-Seidel and Newton-Raphson methods of load flow analysis and examine which method is suitable for load flow calculations of a large power system.

Q.5 Derive the swing equation of single machine infinite bus system and explain rotor dynamics with reference to the same.

Q.6 Explain the working of Static Compensator (STATCOM) with the help of diagram. How does it compensate reactive power in power system?

Q.7. Draw generator cost curves. Why these curves are drawn? Explain the significance of these curves in plant economics.

PART-C   [3x10=30]

(Descriptive/Analytical/Problem-Solving/Design questions)

Attempt any three questions

Q.1.   Two generators rated 200 MW and 400 MW are operating in parallel. The droop characteristics of their governors are 4 % and 5 %, respectively from no load to full load. The speed changers are so set that the generators operate at 50 Hz sharing the full load of 600 MW in the ratio of their ratings. If the load reduces to 400 MW, how will it be shared among the generators and what will the system frequency be? Assume free governor operation.

Q.2.   Apply equal area criterion method for transient stability analysis :

  (i)   When mechanical power input is increased suddenly.

  (ii) When three-phase fault occurs at the sending end of the line.

Q.3.   Figure show the single-line diagram of a simple three-bus power system with generators at buses 1 and 3. The magnitude of voltage at bus-1 is $V_1 = 1.025\angle0°$ per unit. Voltage magnitude at bus-3 is fixed at 1.03 per unit with a real power generation of 300 MW. A load consisting of 400 MW and 200 Mvar is taken from bus-2. Line impedances are marked in per unit on a 100 MVA base, and the line charging susceptances are neglected.

  (i)   Form Y- Bus

  (ii) Obtain the power flow solution up to two-iterations by Gauss-Seidel method.

$V_1 = 1.025 \angle 0°$ $j0.05$ $P_3=300MW$

Slack   1   3 $|V_3| = 1.03$

$j0.025$ $j0.025$

2

400MW   200 Mvar
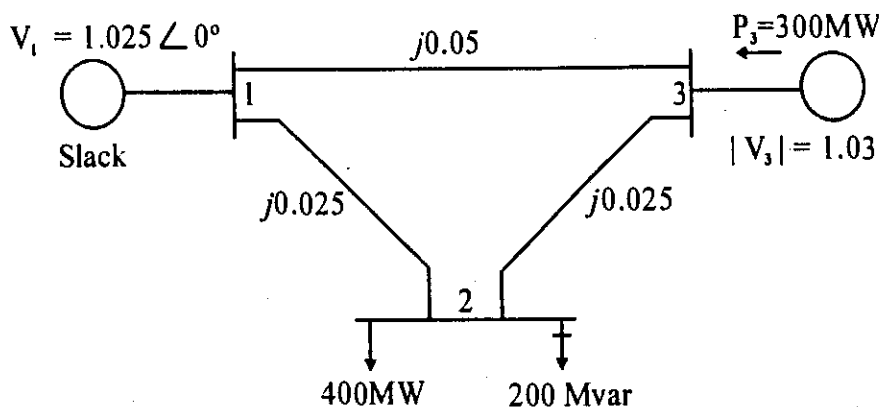
Q.4. The fuel-cost function in \$/h of two thermal plants are

$$C_1 = 320 + 6.2P_1 + 0.004P_1^2$$

$$C_2 = 200 + 6.0P_2 + 0.003P_2^2$$

where P_1 and P_2 are in MW. Plants outputs are subject to the following limits (in MW)

$$50 \le P_1 \le 250$$
$$50 \le P_2 \le 350$$

The per-unit system real power loss with generation expressed in per unit on a 100-MVA base is given by

$$P_{L(pu)} = 0.0125P_{1(pu)}^2 + 0.00625P_{2(pu)}^2$$

The total load is 412.35 MW. Determine the optimal dispatch of generation.

Q.5 Explain the different types of electricity market models in detail with the help of block diagrams and suitable examples.

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6E7143

B.Tech. VI-Sem. (Main/Back) Exam. - 2024

ELECTRICAL ENGINEERING

6EE4-03 Power System Protection

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 may 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. ....

PART-A　　　　　　　　　　　　　[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q. 1. What are aliasing issues?

Q. 2. What do you mean by CT saturation?

Q. 3.   What is frame leakage protection of Bus Bar?

Q. 4.   What are the applications of WAMS for improving protection systems?

Q. 5.   Explain the phenomenon of inrush current.

Q. 6.   What are the advantages of microprocessor based relay over electromechanical relays?

Q. 7.   Define the term pick-up value in a protective relay.

Q. 8.   Distinguish between unit and non unit protection.

Q. 9.   Distinguish between symmetrical and unsymmetrical faults.

Q. 10. What are the essential qualities of protective relay?

PART-B   [5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q. 1.   What do you understand by primary and back-up protection? What is the role of back-up protection? What are the various methods of providing back-up protection?

Q. 2.   Explain different types of over-current relay co-ordination in detail.

Q. 3.   Explain stepped time-distance characteristics of three distance characteristics of three distance relaying units for I, II and III zone of protection.

Q. 4.   How transients are simulated using electro-magnetic transients (EMT) programs.

Q. 5.   Explain the percentage differential relay with harmonic restraint in transformer protection.

Q. 6.   Explain the effectiveness of different fault detection algorithms used in computer-aided protection of electrical power systems. Compare and contrast their advantages and limitations.

Q. 7. For a 132kV system, the reactance and capacitance up to the location of the circuit breaker is 6Ω and $0.030\mu F$, respectively , Calculate the following :

(i) The frequency of oscillations

(ii) The maximum value of restriking voltage across the contacts of the circuit breaker

(iii) The maximum value of RRRV

PART-C [3×10=30]

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any three questions

Q. 1. Explain by help of neat diagram working of Buchholz relay.

Q. 2. Explain with suitable diagram, how Definite Time Over-Current(DTOC) relays are used for protection of a distribution feeder.

Q. 3. Discuss the effect of power swing distance relays.

Q. 4. Evaluate the challenges associated with implementing digital relay protection systems for transformers and generators in modern power systems. Discuss the merits and demerits of digital relays compared to traditional electromechanical relays.

Q. 5. Write a short note on the following :

(i) Synchro Phasors

(ii) Bus Bar Arrangement Scheme

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6E7144

6E7144

B.Tech. VI-Sem. (Main/Back) Exam. - 2024

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)

1. ....   2. ....

PART-A   **[10×2=20]**

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1. What is final energy consumption?

Q.2. What are the primary energy resources?

Q.3. Discuss bench marking while studying energy audit.

Q.4. What do you mean by power factor improvement?

Q.5. Discuss different losses in induction motors in very short.

Q.6. What do you mean by energy performance?

Q.7. What is heat capacity?

Q.8. Discuss energy security.

Q.9. How we calculate motor efficiency?

Q.10. What are the voltage and frequency operating limits of wind farms?

PART-B   [5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1. What is the need of energy audit? Explain different types of energy audit.

Q.2. Briefly discuss the electrical load management and maximum demand control.

Q.3. Define the Energy Conservation Act,2001 and its features.

Q.4. Explain energy pricing with its features.

Q.5. Discuss energy balance diagrams in detail.

Q.6. What is long term energy scenario? Discuss the energy conservation and its importance.

Q.7 Describe the power system interconnection experiences in the different part of the word.

PART-C   [3×10=30]

(Descriptive/Analytical/Problem Solving/ questions)

Attempt any three questions

Q.1. (a) Deliberate the solar PV and wind farm behavior during grid disturbances.

(b) Describe the energy saving opportunities with energy efficient motors.

Q.2. (a) What are the evaporation and condensation?

(b) How moist air and humidity affects the thermal energy?

Q.3. (a) Elaborate the automatic power factor controllers.

(b) Discuss the different methods for preparing process flow for energy system.

Q.4. (a) Explain the distribution and transformer losses.

(b) Discuss briefly the instruments uses for energy audit.

Q.5. (a) How and why selection and location of capacitors in electrical system performed?

(b) What do understand by energy efficient motors and soft starters with energy saver?

Total No. of Questions : 22   Total No. of Pages : 04

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6E7145

6E7145

B.Tech. VI-Sem. (Main/Back) Exam. June - 2024

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 may 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. Nil

2. Nil

PART-A   [10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1   What do you mean by electric drive and its applications?

Q.2   What are the main components of an electric drive system?

Q.3   Draw and explain the torque-speed characteristics of separately excited dc motor.

Q.4   What is regenerative braking and how does it work?

Q.5   Differentiate between motoring and braking modes in a drive system.

Q.6   What is the role of a chopper in a DC drive?

Q.7   How does V/f control improve the performance of an induction motor?

Q.8   What is the significance of varying rotor resistance in a slip ring induction motor?

Q.9   What do you mean by four-quadrant operation in drives?

Q.10   What are the typical applications of slip ring induction motors?

PART-B   [5x4=20]
(Analytical/Problem-solving questions)

Attempt any five questions

Q.1   Explain the torque-speed characteristics of DC motors and their impact on drive applications.

Q.2   Describe the working principle of a DC chopper and its role in DC drives.

Q.3   Illustrate the operation of a DC chopper-fed drive in all four quadrants with the help of a diagram and explain the transitions between each quadrant.

Q.4   Discuss the significance of regenerative braking in the two-quadrant operation of DC chopper-fed drives.

Q.5   Analyse the effects of load variations on the performance and stability of DC drives, providing examples and potential solutions.

Q.6   Explain the space vector modulation technique and compare with SPWM.

Q.7   Describe the relationship between slip and rotor current in an induction motor. How does this relationship affect the motor performance under varying loads?

PART-C [3x10=30]

(Descriptive/Analytical/Problem-Solving/Design questions)

Attempt any three questions

Q.1 Design a closed-loop control system for a DC drive. Explain the choice of components, control methods, and how the feedback loop maintains desired performance. Provide a detailed diagram to support your design.

Q.2 Explain the principle of armature voltage control for varying motor speed in DC motors. Discuss how flux weakening is used for high-speed operation. Include the relevant equations and practical applications for both methods.

Q.3 Derive the expression for torque in an induction motor from its equivalent circuit. Explain the torque-speed characteristics and their implications for motor selection in various industrial applications.

Q.4 Discuss in detail the different control strategies used in AC drives, such as scalar control, vector control, and direct torque control (DTC). Include diagrams and examples to support your discussion.

Q.5 Discuss the principle and operation of power electronic-based rotor side control in slip ring induction motors. Explain the concept of slip power recovery and its practical applications. Include relevant diagrams and equations to support your explanation.

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	Total No. of Questions : 22	**Total No. of Pages :**	04

Roll No. : ....

6E7148

B.Tech. VI-Sem. (Main/Back) Exam. 2024

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)

1. ....   2. ....

PART-A   **[10×2=20]**

(Answer should be given up to 25 words only)

All questions are compulsory

Q. 1   Write any 4 Pros and 4 Cons of Electric vehicles over conventional vehicles.

Q. 2   What are the possible combinations of energy sources in a Hybrid Electric vehicle?

Q.3   Write a few challenges for electric vehicles in India.

Q.4   Write the names of various types of batteries.

Q.5   What do you mean by the size of electric machines?

Q.6   Why we need energy management strategies?

Q.7   In what conditions, Supercharges can perform better than lead acid batteries?

Q.8   What is the role of DC-DC converter?

Q.9   What do you mean by bi-directional controller and uni-directional controller?

Q.10   What do you understand about the Electric Drivetrain?

PART-B   [5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1   Explain various parameters used in estimating the vehicle performance.

Q.2   List and explain various steps involved in the design of a Battery Electric Vehicle.

Q.3   Explain the construction and working of a Fuel Cell.

Q.4.   Explain various components of the Electric Propulsion Unit.

Q.5   Discuss the impact of our modern drive-trains on our energy supplies and environment.

Q.6   Draw and explain various power flow controls in Electric drive train topologies.

Q.7   How will you select the energy storage technology? Explain various factors.

PART-C   [3×10=30]

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any three questions

Q. 1   Discuss the journey of Hybrid and Electric vehicle evaluation. Include the challenges they have faced from time to time.

Q.2   Explain Various hybrid drive-train topologies along with its advantages and disadvantages.

Q.3   Explain various types of energy storage devices used in Hybrid and Electric Vehicles. Also discuss their pros and cons.

Q.4   Explain the configuration and control of Induction Motor drives along with its classification.

Q.5   Classify and compare various energy management strategies in detail.

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6E1572

B. Tech. VI-Sem. (Back) Exam, June 2024

Electrical Engg.

6EE4-02 POWER SYSTEM-II

EE,EX

Time : 3 Hours   Maximum Marks : 120

Instruction 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)

1. ....   2. ....

PART-A   [10x2=20]

(Answer should be given up to 25 words only)

All question are compulsory

Q.1. Explain cause of generation of reactive power.

Q.2. What are the main components of power system ?

Q.3. What do you mean by power system stability ?

Q.4. Define power angle curve.

Q.5. Give applications of STATCOMs.

Q.6. What is droop control in power system ?

Q.7. What is difference between Normal, Alert and Emergency in power system ?

Q.8. Define Contingency analysis in power system.

Q.9. What is Spot Pricing in power system ?

Q.10. What is wholesale competition ?

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PART-B   **[5x8=40]**

(Analytical/Problem-Solving questions)

Attempt any five questions

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Q.1. Write a short note on computational issues in large-scale power system.

Q.2. Explain the formation of Bus Admittance matrix.

Q.3. Explain the effect of series compensation of transmission lines on stability.

Q.4. Describe the impact of stability constraints on power system operation.

Q.5. Write a short note on Tap Changing transformer and their applications.

Q.6. Explain the working of SCADA system.

Q.7. Explain the Demand Side-management.

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PART-C   **[4x15=60]**

(Descriptive/Analytical/Problem-Solving/Design Questions)

Attempt any four questions

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Q.1. Explain the Gauss-Seidel Method for the solution of the power flow equations with flow chart and write down the applications of Gauss-Seidel Method.

Q.2. Derive swing equation and discuss its application in the study of power system stability.

Q.3. Explain the role of automatic voltage regulator (AVR) in improving power system stability.

Q.4. Write a detailed note on the following :

(a) State-estimation

(b) System Security Assessment

Q.5. Write a detailed note on the following :

(a) Generator cost curve

(b) Utility Functions

(c) Power Exchanges

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6E1573

B.Tech. VI-Sem. (Back) June Exam. - 2024

ELECTRICAL ENGINEERING

6EE4-03 Power System Protection

EE, EX

Time : 3 Hours   Maximum Marks : 120

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)

1. ....   2. ....

PART-A

(Answer should be given up to 25 Words only)   [10x2=20]

All questions are compulsory.

Q.1   What are functions of protective relaying?

Q.2   Define the term pick up value in a protective relay.

Q.3   What are different attributes of relays that can be helpful for correct identification of faults in the power networks?

Q.4.   Why are differential relays more sensitive than overcurrent relays?

Q.5.   Why must directional relays be used on a ring main system?

Q.6.   Why is overload protection not necessary for alternators?

Q.7.   What is the difference between an earth relay and overcurrent relay ?

Q.8.   What is the purpose of the under voltage relay ?

Q.9.   What are the advantages of Wide-Area Measurement Systems ?

Q.10. Why harmonic restrain is used in the protection of transformer ?

PART-B

(Analytical/Problem solving questions)   [5x8=40]

Attempt any five questions.

Q.1   Draw an equivalent circuit diagram of CT and derive the phase angle error expression using suitable phasor diagram.

Q.2   A star-connected, 3-phase, 10-MVA, 6.6 kV alternator has a per phase reactance of 10%. It is protected by Merz-Price circulating-current principle which is set to operate for fault currents not less than 175 A. Calculate the value of earthing resistance to be provided in order to ensure that only 10% of the alternator winding remains unprotected.

Q.3   Explain the directional relays with $30°$ and $90°$ connections.

Q.4   A three phase transformer having a line voltage ratio of 400 V / 33 kV is connected in star delta. The CTs on the 400 V side have a current ratio of 1000 / 5. What must be the ratio of CTs on the 33 kV side.

Q.5   Explain the application of WAMS for improving protection systems.

Q.6. Explain the procedure for coordinating relay settings in a power system protection scheme. Include the considerations for different types of relays and their respective settings.

Q.7. Assess the effectiveness of different fault detection algorithm used in computer-aided protection of electrical power systems. Compare and contrast their advantages and limitations.

PART-C

(Descriptive/Analytical/Problem solving/Design questions) [4x15=60]

Attempt any four questions.

Q.1 (a) Explain the different types of potential transformers. [5]

(b) The current rating of an overcurrent relay is 5A. The relay has a plug-setting of 150% and Time Multiplier Setting (TMS) of 0.4. The CT ratio is 400/5. Determine the operating time of the relay for a fault current of 6000A. At TMS = 1 operating time at various PSM are given below: [10]

PSM	2	4	5	8	10	20
Operating time in seconds	10	5	4	3	2.8	2.4

Q.2 (a) Describe the construction and working of a Buchholz relay. Which types of fault are taken care by Buchholz relay? [7]

(b) An 11 KV, 100 MVA generator is provided with differential scheme of protection the percentage of generator winding to be protected against phase to ground fault is 80%. The relay is set to operate when there is 15% out of balance current. Determine the value of resistance placed in the neutral to ground connection. [8]

Q.3 (a) How transients are simulated using electro-magnetic transients (EMT) programs? [8]

(b)   A circuit breaker is rated as 1500 A, 1000 MVA, 33 kV, 3-second, 3-phase oil circuit breaker. Find (i) rated normal current (ii) breaking capacity (iii) rated symmetrical breaking current (iv) rated making current (v) short-time rating (vi) rated service voltage.   [7]

Q.4   (a)   Explain stepped time-distance characteristics of three distance characteristics of three distance relaying units for I, II and III zone of protection.   [8]

(b)   Discuss the faults and various abnormal operating conditions of induction motor and protection provided against each.   [7]

Q.5   What is universal torque equation ? Using this equation derived, draw following characteristics :   [15]

(i)   Impedance Relay

(ii)   Reactance Relay

(iii)   MHO Relay

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6E1574

B.Tech. VI-Sem. (Back) Exam. - 2024

ELECTRICAL ENGINEERING

6EE4-04 / Electrical Energy Conversion and Auditing

Time : 3 Hours   Maximum Marks : 120

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)

1. ....   2. ....

PART-A   **[10 x 2 = 20]**

(Answer should be given up to 25 words only)

All questions are compulsory

Q. 1. What do you understand by motor efficiency?

Q. 2. What is Heat Capacity?

Q. 3. What is Energy Pricing?

Q. 4. Why its need to rewinding of motor?

Q. 5. Differentiate sensible and latent heat.

Q. 6. What are the voltage and frequency operating limits of wind farms?

Q. 7. What do you understand by Energy Performance?

Q. 8. What is energy auditing?

Q. 9. Which instruments uses for energy audit?

Q. 10. Why energy conservation act needed?

PART-B   [5 x 8 =40]

(Analytical/Problem solving questions)

Attempt any five questions

Q. 1. Discuss in detail, energy security.

Q. 2. What is evaporation and condensation?

Q. 3. Deliberate the solar PV and wind farm behavior during grid disturbances.

Q. 4. Describe the energy saving opportunities with energy efficient motors.

Q. 5. Elaborate the selection and location of capacitors in electrical system.

Q. 6. Explain the automatic power factor controllers.

Q. 7. Describe the Power system interconnection experiences in the world.

PART-C
[4 x 15 = 60]

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any four questions

Q. 1. Why it need to restructuring the energy supply sector? Describe the energy strategy for the future.

Q. 2. What is the need of energy audit? Explain types of energy audit.

Q. 3. What do understand by energy efficient motors and soft starters with energy saver?

Q. 4. Discuss the Hybrid and isolated operations of solar PV and wind systems in detail.

Q. 5. Enlighten on the electrical load management and maximum demand control.

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6E1575

B.Tech. VI-Sem. (Back) Exam. June - 2024

ELECTRICAL AND ELECTRONICS ENGG.

6EX4-05 Electric Drives

EE, Ex

Time : 3 Hours   Maximum Marks : 120

Instruction to Candidates :

Attempt all **10** questions from Part-A, **05** questions out of **07** questions from Part-B and **04** questions out of **05** 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)

1. ....   2. ....

PART-A   [10 x 2 = 20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1. What is the Synchronous speed? [2]

Q.2. What is the difference between Chopper and Inverter? [2]

Q.3. Explain the torque in DC Machine. [2]

Q.4. What is the space vector modulation? [2]

Q.5. Write the formula for Duty cycle. [2]

Q.6. Draw the diagram of DC machine. [2]

Q.7. Draw the torque - speed curve of induction motor. [2]

Q.8. What is the regenerative braking? [2]

Q.9. Explain flux weakening operation. [2]

Q.10. What is the Slip regulation? [2]

PART-B [5 x 8 =40]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1. Explain armature voltage control for varying motor speed. [8]

Q.2. Explain the steady state analysis of chopper fed DC drive. [8]

Q.3. Explain the Inner current loop and draw the figure. [8]

Q.4. Draw the figure of induction motor equivalent circuit and write the equation on primary side, secondary side. [8]

Q.5. A 4 pole, 4 parallel path DC motor takes a 40 Amp armature current, the armature is connected by 480 conductors. The flux per pole is 10 mwb. Calculate the graes torque developed by armature of motor. [8]

Q.6. Explain the constant V/f control induction motor. [8]

Q.7. Explain the slip power recovery in induction motor. [8]

PART-C [4 x 15 = 60]

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any four questions

Q.1. Explain the PWM (Pulse Width Modulation) controler three phase generation of signal. [15]

Q.2. Draw the diagram and explain the four quadrant operation of DC machine. [15]

Q.3. Draw the typical torque-speed curves of fan and pump loads and explain variation of torque speed curve with applied voltage, applied frequency. [15]

Q.4. What is impact of rotor resistance of induction motor torque-speed curve? Draw the diagram and explain the slip ring induction motor with external resistance.[15]

Q.5. Explain the dynamic model of DC motor. Write dynamic equation and transfer function. [15]