

6E7141	Roll No. _____	[Total No. of Pages : 2]
	6E7141	
	B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026	
	Electrical and Electronics Engineering 6EX3-01 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).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. Explain advantages and limitations of RISC architecture.
2. Explain different data types used in computer systems.
3. What is a system bus? Explain its types.
4. Explain the concept of virtual memory and its need.
5. Compare optical disks and magnetic disks.
6. Explain the operation of control unit.
7. Explain the difference between 16-bit and 32-bit microprocessors.
8. Differentiate between parallel port and serial port.
9. What is meant by pipelining?
10. What do you mean by Memory Management Unit?

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Compare CISC and RISC architectures in terms of instruction set, execution time, and hardware complexity.
2. Compare fixed-point and floating-point representation.
3. Analyze the organization of system memory and explain how it affects overall computer performance.
4. Analyze features of PCI Express that make it suitable for high-speed applications.
5. Explain Instruction Level Parallelism (ILP) and analyze how it enhances processor throughput.
6. Explain the architecture of a System-on-Chip (SoC).
7. Explain various addressing modes of 80×86 in detail.

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

Attempt any Three questions.

(3×10=30)

1. Explain the architecture and functional units of a general computer system. Also explain input/output unit, memory unit, ALU, control unit, and their interaction during instruction execution with the help of block diagram.
2. Describe binary multiplication and division algorithms. Also explain hardware implementation and performance considerations.
3. What is Direct Memory Access (DMA)? Explain DMA Controller in detail with the help of suitable diagram.
4. Explain the architecture of 8086 microprocessor in detail. Also explain block diagram, functions of Execution Unit (EU) and Bus Interface Unit (BIU), and their interaction.
5. Explain the architecture of a Digital Signal Processor (DSP). Also explain the features in detail with suitable applications.

6E7142	Roll No. _____	[Total No. of Pages : 2]
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	B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026 Electrical and Electronics Engineering 6EX4-02 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. Define load flow analysis and Define slack bus, PV bus, and PQ bus.
2. Differentiate between Gauss-Seidel and Newton-Raphson methods.
3. What is swing equation? Draw power angle curve.
4. Explain the concept of state estimation.
5. Derive the expressions for real and reactive power at a bus.
6. What is spot pricing?
7. What is demand side management? What is electricity market?
8. Compare SVC and STATCOM.
9. What will happen if all buses are taken as PQ buses? Why is reactive power not controlled at PQ bus?
10. Why is equal area criterion not valid for multi-machine systems?

PART - B

(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Explain the formation of bus admittance matrix using inspection method.
2. A 2-Bus power system has the following data:
Bus 1 is slack bus: $V_1 = 1.05 \angle 0^\circ$
Bus 2 is a load bus with $P_2 = -0.5$ p.u and $Q_2 = -0.2$ p.u
Line admittance: $Y_{12} = -j10$
Using Gauss-Seidel method, determine the voltage at bus 2 after one iteration. Assume initial voltage $V_2^{(0)} = 1 \angle 0^\circ$.
3. Explain excitation system in synchronous generators. Describe the working of PMU and WAMS.
4. Differentiate between preventive control and emergency control.
5. Discuss power system security assessment.
6. Explain regulatory framework in power systems.
7. Explain different electricity market models in detail.

PART - C

(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Solve the load flow problem of a two-bus system using Gauss-Seidel method.
2. Analyze system stability using equal area criterion.
3. Explain load frequency control of a single-area system with block diagram.
4. Discuss various methods of voltage control in power systems.
5. Describe SCADA system in detail with block diagram.

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6E7143	Roll No. _____	[Total No. of Pages : 2]
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	B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026	
	Electrical and Electronics Engineering 6EX4-03 Power System Protection 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 modeling of CT and PT with standards.
2. A transformer has CT ratios of 1000/5 on primary and 500/5 on secondary. Calculate whether differential protection will operate for a fault current of 500 A on secondary side.
3. Explain the concept of reach in protective relays.
4. Explain Plug Setting Multiplier (PSM) and Time Multiplier Setting (TMS). How does it affect relay operation.
5. Define directional relay and explain its need.
6. What is aliasing and how can it be avoided?
7. What is restraining coil in differential relay and why is it used?
8. Why are digital relays faster than electromechanical relays?
9. Distinguish between reliability and selectivity in protection systems.
10. What is zone protection in distance relays?

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Explain generator protection schemes in detail. Discuss stator and rotor fault protection methods.
2. Explain the concept of digital protection and its advantages.
3. Explain out-of-step protection in power systems.
4. A feeder is protected by an overcurrent relay with plug setting of 150% and CT ratio of 200/5. The relay current setting is 4 A. Calculate the fault current at which the relay operates.
5. Explain relay testing methods and procedures in protection systems.
6. Discuss relay coordination in radial and ring main systems with suitable diagrams.
7. Describe distance protection of transmission lines with characteristics.

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

Attempt any Three questions.

(3×10=30)

1. Discuss the working and classification of circuit breakers used in protection. Compare different types of circuit breakers.
 2. Describe overcurrent protection. Discuss time-current characteristics of overcurrent relays.
 3. Explain computer-aided protection schemes.
 4. Describe under-frequency and under-voltage protection schemes.
 5. Describe busbar protection schemes. Compare different busbar arrangements and their protection requirements.
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6E7144	Roll No. _____	[Total No. of Pages : 2]
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	B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026	
	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. What is the need of energy conservation?
2. What are the issues of power Quality?
3. What do you mean by tariff?
4. Define auditing types?
5. Difference between energy sources?
6. What is heat capacity?
7. What do you mean by power factor improvement?
8. How we calculate motor efficiency?
9. Define the scenario of energy?
10. Discuss benchmarking performance?

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Explain energy audit and also discuss different types of energy audit?
2. What is "Green House Effect"?
3. What is energy strategy for the future and also explain energy conservation?
4. Explain electrical load management and maximum demand control?
5. Define energy pricing with it's features?
6. Discuss energy balance diagrams in details?
7. What instruments used for energy audit, Explain?

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

Attempt any Three questions.

(3×10=30)

1. Explain the important features of the Energy Conservation Act?
 2. Discuss solar hybrid power system with suitable diagram?
 3. Explain the role of training and awareness in energy management programme?
 4. Elaborate the automatic power factor controllers and also explain why the selection and location of capacitors in electrical system performed?
 5. Explain the energy efficiency light control for assessing existing lighting system in a facility?
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6E7145	Roll No. _____	[Total No. of Pages : 3]
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	B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026 Electrical and Electronics Engineering 6EX4-05 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. Write the torque equation of a DC Motor.
2. Define the base speed of a DC motor.
3. List the methods of electric braking for DC motors.
4. Name the method of speed control of a DC Motor Drive.
5. Write the expression for output voltage of single-phase fully controlled AC-DC converter with continuous mode of conduction.
6. Write the expression for the average output voltage of a DC chopper in terms of duty cycle.
7. Define the duty cycle of a chopper.
8. Write expression for synchronous speed for induction motor.
9. Define slip in an induction motor.
10. State the effect of supply voltage variation on induction motor torque.

PART - B

(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. What is electric drive? Draw a block diagram of an electric drive. Discuss the advantages of Electric drives.
2. Discuss constant torque and constant power operation of DC motor drive.
3. A 200 V, 875 rpm, 150A separately excited DC motor has an armature resistance of 0.06 ohms. It is fed from a single phase fully-controlled rectifier with an AC source voltage of 220 V, 50 Hz. Assuming continuous conduction. Calculate
 - i) Firing angle for rated motor torque and 750 rpm.
 - ii) Firing angle for rated motor torque and -500 rpm.
 - iii) Motor speed for delay angle (α) 160 degree and rated torque
4. Discuss multi-quadrant chopper fed DC drive.
5. Draw and explain the equivalent circuit of an induction motor. Derive the torque equation and discuss the torque-speed characteristics.
6. Discuss that the maximum torque is independent of rotor resistance and maximum slip is independent of voltage in induction motor drive.
7. Name the methods of starting and speed control of Induction motor. Why stator voltage control is suitable for speed control of induction motors in fan and pump drives? Discuss.

PART - C

(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Discuss close loop control of DC Drive.
2. A 230 V, 960 rpm and 200 A separately excited DC motor has an armature resistance of 0.02 ohms. The motor is fed from a chopper which provides both motoring and braking operations. The source has a voltage of 230 V. Assuming continuous conduction.
 - i) Calculate duty ratio of chopper for motoring operation at rated torque and 350 rpm
 - ii) Calculate duty ratio of chopper for braking operation at rated torque and 350 rpm
3. A 220 V, 1500 rpm, 50 A separately excited motor with armature resistance of 0.5 ohms, is fed from a 3-phase fully controlled rectifier. Available AC source has a line voltage of 440 V, 50 Hz. A star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero.
 - i. Calculate transformer turn ratio.
 - ii. Determine the value of firing angle when (a) motor is running at 1200 rpm and rated torque; (b) when motor is running at -800 rpm and twice the rated torque.

4. Discuss the static rotor resistance control of wound rotor induction motor drive. Draw a close loop speed control block diagram and obtain the relation for total rotor resistance in terms of chopper duty cycle.
 5. Explain the V/f (voltage-frequency) control method of an induction motor drive with suitable characteristics, advantages and limitations.
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6E7146	Roll No. _____	[Total No. of Pages : 2]
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	B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026 Electrical Engineering 6EE5-11 Power System Planning (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. Draw a neat diagram of structure of Power System.
2. What are the key objectives of power system planning?
3. Write the depending factors of Forecasting Modeling.
4. Write the types of cogeneration systems.
5. What are the objective of generation planning and factor affecting the generation planning?
6. What is disaster management under the purview of power system?
7. Classify the Distribution network configurations.
8. What are the effects of protection failure in power system?
9. What is reactive compensation?
10. Write a note on rural electrification investment.

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. What is electrical Forecasting Techniques. State the classification and explain the Forecasting Methods.
2. Explain the factors affecting interconnection under emergency assistance.
3. Explain power pooling and power trading.
4. Explain the planning criteria for transmission system of power system.
5. Describe the various types of power disturbances and their remedies.
6. Explain the method to evaluate generation reliability.
7. What are system 'outages'? Explain and compare the terms: 'forced outage' and 'scheduled outage from reliability evaluation point of view.

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

Attempt any Three questions.

(3×10=30)

1. With respect to computer aided planning, discuss in brief on the role of each of the following:
 - a) Wheeling.
 - b) Greenhouse effect.
 - c) Insulation coordination.
 2. Mention the importance of power system planning and the planning tools. Hence discuss on national planning and regional planning in brief terms.
 3. What is Power System Reliability? Explain the aspect of Power System Reliability.
 4. Describe briefly the power planning related electricity regulations prevailing in our country.
 5. What is load forecasting? What are the techniques involved? In what ways, load prediction helps in power system planning?
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