III B. Tech II Semester Regular Examinations, April - 2016
BIO-MEDICAL ENGINEERING
(Electronics and Communication Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What is meant by action potential?	[3M]
	b)	What is an Electrode?	[4M]
	c)	Write about the Mechanics of Breathing.	[4M]
	d)	What is diagnosis?	[4M]
	e)	Write about the Therapeutic Uses.	[4M]
	f)	Define a Monitor.	[3M]

PART -B

2	a)	Discuss in detail the biological cell with a suitable figure.	[8M]
	b)	Explain in detail the 'cell action potential' with the help of typical waveform.	[8M]
3	a)	Give the salient features of needle electrodes.	[3M]
	b)	List out various bio medical electrodes and give their applications.	[8M]
	c)	Give the applications of needle electrodes.	[5M]
4	a)	With a neat block diagram explain the mechanical activities of the heart.	[8M]
	b)	Describe the electrical conduction system of a heart.	[8M]
5	a)	Write about the Elements of Intensive-Care Monitoring.	[8M]
	b)	Explain about the Patient Monitoring Displays.	[8M]
6	a)	Describe about the CAT Scan.	[10M]
	b)	Write the applications of CAT Scan.	[6M]
7	a)	Explain about the various Physiological Effects.	[10M]
	b)	Give examples of the Physiological Effects of electrical current.	[6M]

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III B. Tech II Semester Regular Examinations, April - 2016
BIO-MEDICAL ENGINEERING
(Electronics and Communication Engineering)

Time: 3 hours   Maximum Marks: 70

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2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What is bioelectric potential?	[3M]
	b)	What is the principle of transconduction?	[4M]
	c)	Write about the Respiratory Therapy.	[4M]
	d)	What are Defibrillators?	[4M]
	e)	Write about the Ultrasonic Imaging.	[4M]
	f)	Define a Recorder.	[3M]

PART -B

2	a)	What are the problems encountered in measuring a living system?	[4M]
	b)	Explain the Physiological System of the Body.	[8M]
	c)	What are envoked responses?	[4M]
3	a)	Write about the Electrodes for ECG.	[5M]
	b)	Write about the Electrodes for EEG.	[5M]
	c)	Explain about the Electrodes for EMG.	[6M]
4	a)	Describe the operation of ultrasonic blood flow meter.	[8M]
	b)	Explain why reflectance type is preferred than transmittance type.	[8M]
5	a)	With a neat diagram explain about the Calibration and Repair ability of Patient-Monitoring Equipment.	[8M]
	b)	Explain about the Organization of the Hospital for Patient-Care Monitoring.	[8M]
6	a)	Discuss about the MRI.	[10M]
	b)	Mention the applications of MRI.	[6M]
7	a)	What are Biopotential Amplifiers? Explain.	[10M]
	b)	What are the applications of biopotential amplifiers.	[6M]

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III B. Tech II Semester Regular Examinations, April - 2016
BIO-MEDICAL ENGINEERING
(Electronics and Communication Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	Mention the sources for bioelectric potential.	[3M]
	b)	What is Respiration sensor?	[4M]
	c)	Explain about Measurement of Blood Flow.	[4M]
	d)	What are Audiometers?	[4M]
	e)	Define a Radio-Isotope.	[3M]
	f)	What are Shock Hazards?	[4M]

PART -B

2	a)	What are Resting potentials?	[4M]
	b)	With a neat sketch explain the function of nerve cell.	[8M]
	c)	Write about the ECG.	[4M]
3	a)	What are pulse sensors?	[3M]
	b)	Explain about the Transducers for Biomedical Applications.	[8M]
	c)	Mention the applications of pulse sensors.	[5M]
4	a)	Explain how blood flow can be measured using electromagnetic blood flow meter.	[8M]
	b)	Give the advantages and disadvantages of various excitations on signals.	[8M]
5	a)	What are the advantages of lithium battery as energy source in permanent pacemaker?	[8M]
	b)	In what way demand pacemaker is different from stand by pacemaker.	[8M]
6	a)	Give a brief note on The Components of Biotelemetry System.	[10M]
	b)	Write the applications of Biotelemetry System.	[6M]
7	a)	Explain about the Isolated Power Distribution System.	[10M]
	b)	What are methods of accident prevention?.	[6M]

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SET - 4

III B. Tech II Semester Regular Examinations, April - 2016
BIO-MEDICAL ENGINEERING
(Electronics and Communication Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	Write about the Age of biomedical engineering.	[3M]
	b)	What are transducers with digital output?	[4M]
	c)	What is Plethysmography?	[4M]
	d)	What are Stimulators?	[4M]
	e)	Write the frequency range of ultrasonic.	[4M]
	f)	Define a recorder.	[3M]

PART -B

2	a)	What are envoked responses?	[4M]
	b)	Explain the features of different block of an EEG machine.	[8M]
	c)	List the specifications of an EEG amplifier.	[4M]
3	a)	What are Biochemical Transducers?	[3M]
	b)	With a neat diagram explain about the Basic Transducer Principles.	[8M]
	c)	Mention the applications of Biochemical Transducers.	[5M]
4	a)	Describe about the Physiology of the Respiratory System.	[8M]
	b)	Explain in detail various Respiratory Therapy Equipment.	[8M]
5	a)	Describe the driven RL system in the case of ECG.	[8M]
	b)	Why is the SA node called as natural pacemaker?	[8M]
6	a)	Discuss about the various Implantable Units.	[10M]
	b)	Explain how telemetry can be used for measurement of ECG during exercise.	[6M]
7	a)	What are the various Shock Hazards from Electrical Equipment?	[10M]
	b)	Give a brief note on Methods of Accident Prevention.	[6M]

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III B. Tech II Semester Regular Examinations, April - 2016
MANAGEMENT SCIENCE
(Common to **EEE** and **CHEM**)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	"The nature of management is varied and diverse." Mention any four features of management?	[3M]
	b)	"A poor layout has serious consequences". Explain any four.	[4M]
	c)	"Manpower planning is concerned with the flow of people into and sometimes out of the organization." What are the goals of manpower planning?	[4M]
	d)	What are the rules that are to be carefully observed while drawing a Network?	[3M]
	e)	"Corporate planning has a company-wide and comprehensive perspective." What are the steps involved in the corporate planning process?	[4M]
	f)	"The purpose of benchmarking is to identify and adopt best practices that can lead to superior performance."Explain?	[4M]

PART -B

2	a)	Write about the various functions of management.	[4M]
	b)	What were the highlights of Henry Fayol's contribution to management?	[8M]
	c)	Mention the steps involved in the Decision making process.	[4M]
3	a)	Mention the benefits of Statistical Quality Control?	[4M]
	b)	"Inspection is done for a wide variety of purposes." Why is inspection necessary? What are the various methods of inspection?	[7M]
	c)	What are the objectives of Inventory control?	[5M]
4	a)	Discuss in detail about the various functions of HR manager.	[8M]
	b)	What are the factors affecting the choice of Channel of distribution?	[8M]
5	a)	Mention various strategies to minimize and bridge the gaps in Project management.	[8M]
	b)	Write about the differences between PERT and CPM.	[8M]
6	a)	"The corporate plans provide a rational approach to achieve corporate goals." What are the various element of Corporate planning process?	[8M]
	b)	Explain in detail about International Environment analysis.	[8M]
7	a)	Mention about the key methodologies of Six sigma.	[8M]
	b)	What are the prerequisites for successful implementation of Total Quality Management?	[8M]

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III B. Tech II Semester Regular Examinations, April - 2016
MANAGEMENT SCIENCE
(Common to **EEE** and **CHEM**)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART –A

1 a) "Organization involves creating structure of relationships among people working for the desired results." Explain the significance of organization. [3M]
   b) What are the benefits of Work study? [4M]
   c) Mention the advantages of Job Evaluation. [4M]
   d) Mention the differences between PERT and CPM. [3M]
   e) Write short notes on Vision and Mission. [4M]
   f) "BPOs, or the units to which work is being outsourced, are highly flexible, quicker, cheaper and very efficient."Explain. [4M]

PART -B

2 a) "Scientific management proved to be very beneficial to the industry at large." Explain. [4M]
   b) Briefly write about the cardinal principles of a sound Organization. [8M]
   c) Evaluate Matrix organization in terms of the merits and demerits. [4M]

3 a) Write briefly about batch production. [4M]
   b) "Method study refers to the systematic recording and critical examination of existing and proposed ways of doing work." Write about the basic procedure used in the process of method study. [7M]
   c) Explain about the various types of ABC analysis in brief. [5M]

4 a) Differentiate personnel and industrial relations from Human Resource Management. [8M]
   b) "The Job description emphasizes the job requirements." Mention the contents and advantages of Job description. [8M]

5 a) Write briefly about Network Analysis? Mention the rules that should be carefully observed while drawing a Network. [8M]
   b) What is critical path? What are the steps involved in identifying critical path? [8M]

6 a) "Strategy formulation and implementation is the crux of the strategic management process." What are the various stages involved in the process of Strategy formulation and implementation? [8M]
   b) What are the factors that are to be diagnosed in the External environment for the purpose of Strategy formulation? [8M]

7 a) "The purpose of Benchmarking is to identify and adopt best known practices that can lead to superior performance." Explain. [8M]
   b) "Business Process Reengineering has shown huge returns to several companies where it has been well implemented." Explain in detail about BPR. [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
MANAGEMENT SCIENCE
(Common to **EEE and CHEM**)

Time: 3 hours
Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	Write short notes on Planning and Controlling.	[3M]
	b)	Mention about the advantages and disadvantages of Fixed layout.	[4M]
	c)	What is the importance of Human Resource Management?	[4M]
	d)	"Network analysis refers to a number of techniques for the planning and control of complex projects." What are the main advantages of using Network?	[3M]
	e)	Explain about the significance of SWOT analysis.	[4M]
	f)	What are the main objectives of Material Requirement Planning?	[4M]

PART -B

2	a)	What are the functions, the manager has to perform while directing the members of his group?	[4M]
	b)	"Decision making is a rational process comprising certain defined steps." Explain.	[8M]
	c)	Briefly write about Frederick Herzberg's two-factor theory of motivation.	[4M]
3	a)	Mention the objectives of work measurement.	[4M]
	b)	"Inventory control is defined as the scientific method of providing the right type of material at the right time in the right quantities and at the right price to sustain the given production schedules." Briefly mention about various Inventory control techniques.	[7M]
	c)	Briefly write about Economic Order Quantity.	[5M]
4	a)	Briefly write about the types of Channels of distribution with suitable examples.	[8M]
	b)	What are stages of product life cycle? What are the marketing strategies, based on product life cycle?	[8M]
5	a)	Differentiate between PERT and CPM?	[8M]
	b)	Briefly write about the costs that are associated with any project?	[8M]
6	a)	"A Mission statement defines why the organization exists." What are the characteristics of a Mission statement?	[8M]
	b)	"Environmental scanning aims at identifying the new opportunities in which the firm can perform profitably. Explain.	[8M]
7	a)	"Supply chain management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management activities." Explain.	[8M]
	b)	"Enterprise Resource Planning systems (ERPs) integrate all data and process of an organization into a unified system." Explain.	[8M]

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III B. Tech II Semester Regular Examinations, April - 2016
MANAGEMENT SCIENCE
(Common to **EEE** and **CHEM**)

Time: 3 hours   Maximum Marks: 70

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2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) "Douglas Mc Gregor presented two sets of assumptions managers make about the nature of their employees." Explain?   [3M]
   b) What are the main objectives of Inventory control?   [4M]
   c) "Management By Objectives method considers the actual performance as the basis for evaluation." Explain?   [4M]
   d) Write short notes on Optimistic time estimate and Pessimistic time estimate?   [3M]
   e) Write short notes on Generic strategy alternatives?   [4M]
   f) What are the major benefits of Just In Time system of production?   [4M]

PART -B

2 a) What were the arguments against Scientific management?   [4M]
   b) "The process of management encompasses certain functions to be performed in a logical sequence." Explain?   [8M]
   c) Write about the various organization structures in brief.   [4M]

3 a) Mention the features of Mass production?   [4M]
   b) "There are various inventory control techniques employed to enhance the productivity levels in an industry environment." Explain?   [7M]
   c) Why is Acceptance sampling preferred?   [5M]

4 a) "Merit rating is the process of evaluating the relative merit of the person on a given job." Mention any four methods of Merit rating?   [8M]
   b) What is meant by Marketing management? What are the various functions of marketing?   [8M]

5 a) Differentiate between PERT and CPM?   [8M]
   b) What is the need for float in CPM network? Briefly write about Optimistic time estimate, Pessimistic time estimate and Most likely time estimate?   [8M]

6 a) Briefly explain about SWOT analysis with suitable examples?   [8M]
   b) Write about the steps in strategy formulation with appropriate examples. [8M]

7 a) "Value chain analysis is a chain of activities through which a product/service passes in order to gain value in every activity." Explain?   [8M]
   b) What do you mean by Capability Maturity Model (CMM)? Briefly mention about various levels of CMM?   [8M]
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R13

SET - 1

III B. Tech II Semester Regular Examinations, April - 2016
SWITCHGEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What are various rating of a circuit breaker?	[3M]
	b)	What is protective relay? Give its fundamental requirements.	[4M]
	c)	What is earth fault?	[4M]
	d)	What is differential protection?	[4M]
	e)	List the advantages of static relays.	[3M]
	f)	Explain the need for a lightning arrester.	[4M]

PART -B

2	a)	Discuss the rate of rise of restricking voltage and explain its importance in arc extinction.	[8M]
	b)	Explain the working of a SF_6 circuit breaker.	[8M]
3	a)	Explain the working of differential relays.	[4M]
	b)	Describe the functionality of a mho relay.	[7M]
	c)	Compare various types of distance relays.	[5M]
4	a)	What are various faults that occur in the rotor of an alternator and how the rotor is to be protected from these faults?	[8M]
	b)	Explain in detail about Bucholtz relay with a neat sketch.	[8M]
5	a)	Draw the schematic diagram of the carrier current protection scheme of lines. Also explain its working principle.	[8M]
	b)	What is the principle of differential relays? Explain their characteristics and limitations?	[8M]
6	a)	List the advantages and disadvantages of microprocessor based relays.	[8M]
	b)	With the help of neat diagram explain the principle of static differential relay?	[8M]
7	a)	Describe the construction, principle of operation and application of valve type lightning arrester?	[8M]
	b)	What are the different types of grounding? Explain the reactance grounding?	[8M]

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(**R13**)   (SET - 2)

III B. Tech II Semester Regular Examinations, April - 2016
SWITCHGEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What is meant by current chopping?	[3M]
	b)	Why directional feature provided for impedance relay cannot be used for reactance relay?	[3M]
	c)	List the different types of Generator faults.	[4M]
	d)	What is magnetizing in rush current?	[4M]
	e)	Explain the importance of zero cross detector in static relays.	[3M]
	f)	Why is grounding required?	[4M]

PART -B

2	a)	Describe the construction and working of an SF_6 circuit breaker?	[9M]
	b)	A 11 KV, 400 MVA circuit breaker suddenly closes on to a fault. Determine (i) symmetrical breaking current (ii) Asymmetrical breaking current assuming 50% DC component (iii) Peak making current.	[7M]
3	a)	Discuss with necessary circuit diagram, the principle of operation of an induction disc relay. What are the advantages of induction cup relays over induction disc relays?	[8M]
	b)	What is universal torque equation? Using this equation derive the characteristics of (i) impedance relay (ii) reactance relay (iii) mho relay.	[8M]
4	a)	Explain the construction and principle of operation of a Buchholz relay.	[8M]
	b)	Describe with a neat sketch the percentage differential protection of a modern alternator.	[8M]
5	a)	Explain in detail about the Merz price voltage balanced system with a neat single line diagram.	[8M]
	b)	Describe in detail the protection of parallel feeder and ring mains.	[8M]
6	a)	Describe the basic functional blocks of a digital relay.	[8M]
	b)	Explain the working of a static over current relay.	[8M]
7	a)	What is the function of surge absorber? In what way it is different from lightening arrestor?	[8M]
	b)	State the advantages of neutral grounding of an electrical system. Give a connection diagram of typical arc suppression coil.	[8M]

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SET - 3

III B. Tech II Semester Regular Examinations, April - 2016
SWITCHGEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART –A

1	a)	Define restricking voltage?	[3M]
	b)	What type of relays is affected by power swings?	[4M]
	c)	What type of relay is used for loss of excitation of an alternator?	[4M]
	d)	What is the commonly used protection for 3 phase feeders?	[4M]
	e)	What are the advantages of static over current relays?	[3M]
	f)	What is expulsion gap lighting arrester?	[4M]

PART -B

2	a)	Explain the reason for initiation of electric arc during contact separation.	[7M]
	b)	Describe with the aid of neat sketch the working of a air blast circuit breaker.	[9 M]
3	a)	Explain the requirement of primary and back up protection in any equipment.	[8M]
	b)	Explain in detail about the Induction disc type relay with a neat sketch.	[8M]
4	a)	Explain a scheme of protection for failure of alternator excitation.	[8M]
	b)	Discuss the different types of transformer faults. What are various protective schemes available for transformers?	[8M]
5	a)	Explain in detail about the time graded and current graded system.	[8M]
	b)	Explain the construction and principle of operation of a translay relay applied to a single phase system.	[8M]
6	a)	Write the pseudo code for programming the distance relays on the microprocessor.	[8M]
	b)	Explain in detail about the static over current relay.	[8M]
7	a)	Discuss the causes of over voltages in a power system.	[8M]
	b)	Explain the different methods of neutral grounding.	[8M]

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III B. Tech II Semester Regular Examinations, April - 2016
SWITCHGEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	Define recovery voltage	[3M]
	b)	What are the merits of over current relays?	[4M]
	c)	List the faults that occur in Rotor of a generator.	[4M]
	d)	What type of relay is used for feeder protection	[4M]
	e)	What are the disadvantages of microprocessor relays?	[3M]
	f)	What is lighting discharge?	[4M]

PART -B

2	a)	Explain in detail about Air blast circuit breaker with a neat circuit diagram.	[4M]
	b)	The following data refers to a 3 phase, 50 Hz generator. EMF between the lines 7.5 kV, reactance of generator and connected systems 4 Ohm, distributed capacitance to neutral 0.01microfarad, calculate the frequency of restricking voltage transient.	[8M]
	c)	Discuss performance of a circuit breaker when capacitive currents are interrupted	[3M]
3	a)	Explain the characteristics of distance relays.	[8M]
	b)	Explain the importance of under voltage/ over voltage relays with an example for each.	[8M]
4	a)	Explain split-phase relaying protection of a 3 phase alternator with relevant diagrams?	[8M]
	b)	Explain the protective scheme for the transformer that takes care of magnetizing inrush current without affecting the sensitivity.	[8M]
5	a)	Elaborate on various methods for protection of feeders.	[8M]
	b)	What is the importance of bus-bar protection? What are the requirements of protection of lines?	[8M]
6	a)	Explain the construction and working of static distance relay.	[8M]
	b)	Explain the different components of static relay with a neat block diagram.	[8M]
7	a)	Discuss the causes of over voltages in a power system.	[8M]
	b)	Explain the characteristics of standard impulse voltage. Why is it needed for testing?	[8M]

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R13

SET - 1

III B. Tech II Semester Regular Examinations, April – 2016
MICROPROCESSORS AND MICROCONTROLLERS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	Specify the size of data, address, memory word and memory capacity of 8086 microprocessor	[3M]
	b)	What do you mean my masking the interrupt? Explain	[4M]
	c)	How is PUSH B instruction executed? Find the status after execution	[4M]
	d)	Write the function of OBF in 8255?	[3M]
	e)	List the on-chip peripherals of 8051 microcontroller.	[4M]
	f)	What is the difference between A/D and D/A converters?	[4M]

PART –B

2	a)	Draw the flag register of 8086 microprocessor.	[4M]
	b)	Discuss how pipelined architecture is implemented in 8086	[8M]
	c)	List classification of signals in 8086 microprocessor.	[4M]
3	a)	Give two examples for logical and branch instructions of 8086.	[4M]
	b)	Draw the timing diagram for op-code fetch machine cycle and memory read machine cycle.	[7M]
	c)	Write an assembly language program to multiply two 16 bit numbers.	[5M]
4	a)	Write instructions to load hexadecimal numbers 61B4H in register C and 8245H in accumulator. Display the number 61B4H in port0 and 8245H in port1.	[8M]
	b)	List various assembler directives of 8086 microprocessor.	[8M]
5	a)	Draw the logical block diagram of 8279 keyboard display controller and explain.	[8M]
	b)	How data is transmitted in asynchronous serial communication?	[8M]
6	a)	Draw the pin Diagram of 8051 and explain the function of various signals.	[10M]
	b)	Explain addition and subtraction instructions of 8051.	[6M]
7	a)	Interface an 8×8 keyboard using 8255 ports and write a program to read the code of pressed key	[8M]
	b)	Quantify the number of register banks in 8051 and say how CPU knows which bank is currently in use.	[8M]

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R13

SET - 2

III B. Tech II Semester Regular Examinations, April – 2016
MICROPROCESSORS AND MICROCONTROLLERS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	How the identified memory segment is accessed by 8086 microprocessor?	[3M]
	b)	Differentiate between maximum mode and minimum mode of 8086.	[4M]
	c)	List the alternative functions assigned to Port 3 pins of 8051microcontroller	[4M]
	d)	Discuss basic features of 8259	[3M]
	e)	Mention the I/O instructions of 8051 microcontroller.	[4M]
	f)	What do you mean by quantization noise?	[4M]

PART –B

2	a)	Discuss architecture of 8086 microprocessor.	[8M]
	b)	List basic features of 80286 microprocessor.	[4M]
	c)	List any two data manipulation instructions.	[4M]
3	a)	Describe interrupt structure of 8086 microprocessor in brief.	[3M]
	b)	Discuss about instruction format and different addressing modes of 8086.	[8M]
	c)	Draw and explain timing diagram of memory write operation.	[5M]
4	a)	What is an assembler directive? Explain following assembler directives. (i) ORG (ii) DT (iii) GROUP (iv) SEGMENT (v) EQU	[8M]
	b)	Write an ALP in 8051 to count number of positive and negative numbers from an array of 8-bit integers.	[8M]
5	a)	With neat block diagram explain the functions of 8259	[8M]
	b)	Discuss the process of stepper motor interfacing.	[8M]
6	a)	List the various instructions available in 8051 microcontroller.	[8M]
	b)	Explain in detail the modes of operation of Timer unit in 8051 Microcontroller.	[8M]
7	a)	How to interface a 7 segment display using 8051 microcontroller	[8M]
	b)	What do you understand by bit addressable RAM in 8051 microcontroller?	[8M]

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III B. Tech II Semester Regular Examinations, April – 2016
MICROPROCESSORS AND MICROCONTROLLERS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) If the stack segment register contains 3000h and stack pointer register contains 8434h, what is the physical address of the top of the stack in 8086 microprocessor? [3M]

   b) Define machine cycle [4M]

   c) Mention the size of DPTR and Stack Pointer in 8051 microcontroller [4M]

   d) Write advantages of PIC chips in microprocessor based systems. [3M]

   e) What are the addressing modes of 8051 microcontroller? [4M]

   f) Name any two types of A to D converters. [4M]

PART –B

2 a) List basic features of 80386 microprocessor. [4M]

   b) Draw the signal configuration of 8086 and explain the purpose of each signal. [8M]

   c) Discuss the similarities and differences between COMPARE and SUBTRACT instructions. [4M]

3 a) Draw the timing diagram of I/O read cycle. [3M]

   b) Discuss the addressing modes of 8086 with suitable examples. [8M]

   c) Describe with a suitable example, operation of a stack. [5M]

4 a) Compare macros and procedures with suitable examples. [8M]

   b) Give the assembly language implementation of the following: [8M]
       (i) FOR LOOP   (ii) REPEAT   (iii) IF-THEN-ELSE

5 a) Draw block diagram of 8255 and explain its modes of operation. [8M]

   b) Discuss the features of 8259 and 8279. [8M]

6 a) Write an 8051 ALP to find Fibonacci series of N numbers. [8M]

   b) Explain various types of jump instructions in 8051. [8M]

7 a) How do you interface a 4 × 4 matrix keyboard using 8051 microcontroller? [8M]

   b) Explain different methods of memory address decoding in 8051 microcontroller. [8M]

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III B. Tech II Semester Regular Examinations, April – 2016
MICROPROCESSORS AND MICROCONTROLLERS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1	a)	Why do we need look-up table?	[3M]
	b)	Define instruction cycle	[4M]
	c)	What is the operation of given 8051 microcontroller instructions: XRL A, direct?	[4M]
	d)	What is key debouncing?	[3M]
	e)	What are the different operations performed by boolean variable instructions of 8051?	[4M]
	f)	How much current is needed to drive an LED?	[4M]

PART –B

2	a)	Discuss the features of 80486 microprocessor	[4M]
	b)	Discuss in-detail about instruction set of 8086 microprocessor.	[8M]
	c)	What is instruction pipelining?	[4M]
3	a)	Compare the similarities and differences of CALL and RET instructions with PUSH and POP instructions.	[3M]
	b)	Write a program with a flowchart to multiply two 8-bit numbers.	[8M]
	c)	How address decoding is done in memory interface? Discuss.	[5M]
4	a)	What is the difference between Microprocessors and Microcontrollers?	[8M]
	b)	What is a MACRO? How do you pass parameters to MACRO's?	[8M]
5	a)	Make a comparison between parallel and serial type of data transfer.	[8M]
	b)	Show the control word format of 8255 and explain how each bit is programmed?	[8M]
6	a)	Write an 8051 ALP to find the average of N numbers.	[8M]
	b)	Explain the Data transfer instructions and Program control instructions of 8051 microcontroller.	[8M]
7	a)	Explain the interfacing of keyboard/display with 8051 microcontroller.	[8M]
	b)	Why do we need opto-isolator circuit between microcontroller and the stepper motor?	[8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SEMICONDUCTOR DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What are the main factors which decide the choice of electrical drive for a given application?	[3M]
	b)	Describe the flux control method of series motor.	[4M]
	c)	Explain the first quadrant chopper controlled separately excited dc motor.	[4M]
	d)	Draw the block diagram of closed loop operation of induction motor drives.	[3M]
	e)	Define Slip power and its significance.	[4M]
	f)	When operating in true synchronous mode, why the frequency must be changed in small steps?	[4M]

PART -B

2	a)	Explain the different components of basic electrical drive system.	[8M]
	b)	Describe different braking methods employed for electrical motors.	[8M]
3	a)	Explain the operation of a separately excited dc motor supplied from 3-phase fully controlled rectifier with necessary diagrams. Assume Continuous conduction.	[8M]
	b)	A 220V, 1440rpm, 120A separately excited DC motor with armature resistance of 0.7 Ω is fed from 3-phase fully controlled converter with an ac source line voltage 440V, 50 Hz supply. A star connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero. Calculate the value of firing angle when motor is running at 1200 rpm at rated torque.	[8M]
4	a)	Explain the operation of a four quadrant chopper fed to the D.C series motor and also draw the current and voltage wave forms for continuous current operation.	[8M]
	b)	A 220v, 24A, 1000rpm separately excited dc motor having an armature resistance of 2Ω is controlled by a chopper. The chopping frequency is 500Hz and the input voltage is 230V. Calculate the duty ratio for a motor torque of 1.2 times rated torque at 500rpm.	[8M]

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5 a) Discuss speed control of induction motor from stator side with speed-torque curves. [8M]

   b) The parameters of a three phase 400 Volts, 50 Hz, 6 pole, 960 rpm, and star connected induction motor has the following parameters per phase referred to the stator. R_1= 0.4 Ohm. R_2 = 0.20 Ohm, $X_1 = X_2$ =1.5 Ohm, X_m = 30 Ohms. If the motor is controlled by variable frequency control at a constant flux of rated value, determine the motor speed and the stator current at half the rated torque and 25Hz. [8M]

6 a) Draw the circuit diagram and explain the operation of rotor- resistance control of Induction motor. Mention the advantages and disadvantages of the above method of control. [8M]

   b) Explain Static Kramer drive for a three phase induction motor. [8M]

7 a) Describe self-controlled and load-commutated inverter controlled synchronous motor drives in detail. [8M]

   b) Draw the block diagram of a closed loop synchronous motor drive fed from VSI. [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SEMICONDUCTOR DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) Explain in detail about components of load torques.   [3M]

   b) Briefly explain different speed control techniques for D.C. motor.   [4M]

   c) Describe the first quadrant chopper control of dc series motor.   [4M]

   d) Why V/f ratio must be constant for a frequency controlled induction motor drive?   [3M]
       Explain.

   e) Draw and explain the equivalent circuit of a wound rotor induction motor when   [4M]
       voltage is injected in the rotor circuit.

   f) Compare self-controlled and load-commutated inverter controlled synchronous motor   [4M]
       drives.

PART -B

2 a) Explain the four quadrant operation of a motor drive in general.   [8M]

   b) Describe different braking methods employed for D.C. motors.   [8M]

3 a) Explain the operation of 3-phase six pulse converter feeding DC series motor with   [8M]
       neat diagram and relevant waveforms.

   b) A 200V, 875rpm, 150A separately excited dc motor has an armature resistance of   [8M]
       0.06ohm. It is fed from a three phase fully controlled rectifier with an ac source of
       220V, 50Hz. Assuming continuous conduction, calculate
           (i)   Firing angle for rated motor torque and 750rpm.
           (ii)   Motor speed for $\alpha=160^0$ and rated torque.

4 a) Explain with circuit and waveforms of four quadrant chopper fed separately excited   [8M]
       DC motor.

   b) A 230V, 960rpm and 200A separately excited dc motor has an armature resistance of   [8M]
       0.02Ω. The motor is fed from a chopper, which is capable of providing both motoring
       and braking operations. The source has a voltage of 230V. Assuming continuous
       conduction: When motor is operated in Dynamic braking, with Braking resistance of 2
       ohm
       (i) calculate Duty ratio of chopper for a motor speed of 600 rpm and braking torque of
       twice the rated value.
       (ii) What will be the motor speed for a duty ratio of 0.6 and motor torque equal to
       twice its rated value?

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5 a) Explain why stator voltage control is suitable for speed control of Induction motors in fan and pump drives. Draw and explain speed control of 3 phase Induction motor using AC Voltage Controller. [8M]

   b) The rotor resistance and stand still reactance referred to stator of a 3 phase, 4 pole, 50 Hz Squirrel cage Induction motor is 0.2 ohm and 0.8 ohm per phase respectively. The full load slip of the motor is 4 percent. Neglect stator resistance and leakage reactance. Determine how much stator voltage should be reduced in order to get a speed of 1200 rpm if the load torque remains constant. [8M]

6 a) Draw the circuit diagram and explain the working of a slip power recovery system using static Scherbius system for a three phase induction motor. [8M]

   b) Explain Static Kramer drive for a three phase induction motor. [8M]

7 a) Explain the operation of Load commutated CSI fed Synchronous motor drive. [8M]

   b) In variable frequency control of a synchronous motor why (V/f) ratio is maintained constant up to base speed and V constant above the base speed. Explain briefly with necessary waveforms. [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SEMICONDUCTOR DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What are advantages of electrical drive?	[3M]
	b)	Discuss the drawbacks of rectifier control of dc series motor.	[4M]
	c)	List the advantages offered by dc chopper drives over line-commutated converter controlled dc drives.	[4M]
	d)	Draw the speed-torque characteristics of induction motor with variable frequency control.	[3M]
	e)	Why rotor resistance control is preferred in low power crane drives?	[4M]
	f)	What is the basic difference between true synchronous mode and self control mode for variable frequency control of Synchronous motor?	[4M]

PART -B

2	a)	What do you mean by regenerative braking of motor? Explain.	[8M]
	b)	Explain about nature and classification of different load torques.	[8M]
3	a)	Explain the operation of dual converter controlling the separately excited dc motor.	[8M]
	b)	A 220 V, 1500 rpm, 11.6 A separately excited motor is controlled by a 3-phase fully controlled rectifier with an ac source voltage of 230 V, 50 Hz. Enough filter inductance is added to ensure continuous conduction for any torque greater than 25 percent of rated torque, Ra = 2Ω. (i) What should be the value of the firing angle to get the rated torque at 1000 rpm? (ii) Ca1culate the firing angle for the rated braking torque and –1500 rpm. (iii) Ca1culate the motor speed at the rated torque and $\alpha = 160^0$ for the regenerative braking in the second quadrant.	[8M]
4	a)	Explain with circuit and waveforms of two quadrant chopper fed separately excited DC motor.	[8M]
	b)	A 230V, 960 rpm and 200A separately excited dc motor has R_a=0.02ohm. The motor is fed from a chopper which provides both motoring and braking operations. Assume continuous conduction. Calculate duty ratio of chopper for motoring and braking operations at rated torque and 350 rpm.	[8M]

1 of 2

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5 a) Show that variable frequency control of induction motor is more efficient than stator voltage control. [7M]

   b) A 440V, 3 phase, 50 Hz, 6 pole, 945 rpm, delta connected Induction Motor has the following parameters referred to the stator. [9M]
   $R_s = 2\Omega, R_r = 2\Omega, X_s = 3\Omega, X_r = 4\Omega$.
   When driving a fan load at rated voltage it runs at rated speed. The motor speed is controlled by stator voltage control. Determine motor terminal voltage, current and torque at 800 RPM.

6 a) Explain static Scherbius drive control for speed control of induction motor. Draw speed -torque characteristics. [8M]

   b) Explain with circuit and waveforms for speed control of induction motor by Static rotor resistance. [8M]

7 a) Describe the operation of self-controlled Synchronous Motor drives in detail. [8M]

   b) Describe the open-loop and closed loop methods of speed control of a synchronous motor using VSI. [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SEMICONDUCTOR DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) Explain about fundamental torque equation.   [3M]

   b) Describe the rectifier control of dc series motor.   [4M]

   c) Draw the block diagram of closed loop operation of chopper controlled dc motor. [4M]

   d) Explain the significance of (V/f) speed control method of an induction motor. [3M]

   e) Draw the circuit diagram for static Scherbius drive   [4M]

   f) Compare self-controlled and load-commutated inverter controlled synchronous motor drives. [4M]

PART -B

2 a) Explain the different components of basic electrical drive system.   [7M]

   b) Explain the four quadrant operation of a motor drive in general.   [9M]

3 a) Explain the operation of a separately excited dc motor supplied from 3-Φ semi controlled rectifier. [8M]

   b) A 12.2 kW, 230 V, 850 rpm, 56 A dc separately exited motor is controlled by a 3-phase fully-controlled rectifier fed from 460 V, 60 Hz ac supply through a transformer. It has an armature resistance of 0.284 Ω and sufficient inductance to assure continuous conduction for all operating points with torques greater than 20 percent of the rated. The transformer and the source impedance can be neglected. [8M]
   (i) A rated dc voltage across the motor at full load is desired. Choose a suitable transformer from the following three available:
       (i) 460/460 V
       (ii) 460/230 V
       (iii) 460/ 180 V
   (ii) Having chosen the transformer find the following:
       (i) The rectifier firing angle for the rated torque and speed.
       (ii) The rectifier firing angle for the rated braking torque and the speed of 600 rpm in the reverse direction.

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4   a)   With circuit and waveforms explain the operation of four quadrant chopper fed separately excited DC motor.   [8M]

b)   A 230 V, 500 rpm, 90 A separately excited dc motor having an armature resistance and inductance of 0.115 Ω and 11 mH respectively, is controlled by a c1ass C two-quadrant chopper operating with a source voltage of 230 V and a frequency of 400 Hz.   [8M]
(i) Calculate the motor speed for a motoring operation at δ = 0.5 and half of rated torque.
(ii) What will be the motor speed when regenerating at δ = 0.5 and rated torque?

5   a)   Explain speed control of induction motor by AC Voltage Controllers.   [7M]

b)   A 3 phase, 4 pole, 50 Hz squirrel cage Induction motor has the following circuit parameters: [9M]
$r_1 = 0.05$ohm, $r_2 = 0.09$ohm, $X_1 + X_2 = 0.55$ohm.
The motor is star connected and rated voltage is 400V. It drives a load whose torque is proportional to the speed and is given as $T_1 = 0.05\omega$ N-m. Determine the speed and torque of the motor for a firing angle of 45^0 of the AC Voltage Controller on a 400V, 50 Hz supply.

6   a)   Draw the circuit diagram and explain the working of a slip power recovery system using Static Kramer drive for a three phase induction motor.   [8M]

b)   Explain with circuit and waveforms for speed control of induction motor by Static rotor resistance method.   [8M]

7   a)   How is the output voltage of a VSI improved by PWM techniques? Explain how you will use this converter for speed control of a synchronous motor.   [8M]

b)   Discuss in detail with suitable circuit diagram the principle of operation of self-controlled Synchronous motor drive employing load commutated thyristor inverter.   [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SYSTEM ANALYSIS
(Electrical and Electronics Engineering)

Time: 3 hours | Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) What is one line diagram? How the power system components are represented for it? [3M]
   b) What is the need for load flow study? [4M]
   c) What is bus impedance matrix? Mention its importance. [4M]
   d) What is the need for short circuit study (or) fault analysis? [3M]
   e) What are sequence impedances and sequence networks? [4M]
   f) Distinguish between steady state and transient stability. [4M]

PART –B

2 a) Show that the per unit equivalent impedence of a two winding transformer is the same whether the calculations is made from H.V. side or the L.V. side. [8M]
   b) What are the advantages of Y_{bus} over Z_{bus}? [8M]

3 a) What are the works involved in a load flow study? [3M]
   b) With the help of a neat flow chart, explain the Newton-Raphson method of load flow solution when the system contains voltage controlled busses in addition to swing bus and load bus. [8M]
   c) Compare G-S method and N- R methods of load flow solutions. [5M]

4 a) Compute the bus impedance matrix for the system shown in figure below by adding element by element. Take bus (2) as reference bus. [9M]
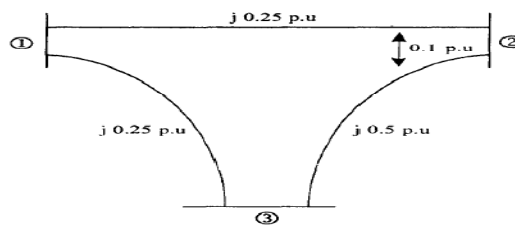
   b) Explain the modifications necessary in the Z_{BUS} when a mutually coupled element is removed or its impedance is changed. [7M]

5 a) A-3-phase, 25 MVA, 11 KV alternator has internal reactance of 6%. Find the external reactance per phase to be connected in series with the alternator so that steady state short circuit current does not exceed six times the full load current. [8M]
   b) Explain the procedure for making short circuit studies of a large power system using digital computer. Illustrate the answer by considering a symmetrical fault. [8M]

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6 a) What are the various types of faults? Discuss their frequency of occurrence and   [9M]
        severity? Find the fault current when an L-L-G fault occurs at the terminals of an
        unloaded generator.

   b) Derive an expression for the positive sequence current I_{a1} of an unloaded generator   [7M]
        when it is subjected to a double line to ground fault.

7 a) Explain critical clearing time and critical clearing angle, deriving the expressions.   [8M]

   b) Describe the methods of improving transient stability.   [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SYSTEM ANALYSIS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) What is the advantage of per unit method over percent method? [3M]

   b) What are the information's that are obtained from a load flow study? [4M]

   c) Write the four ways of adding impedance to an existing system so as to modify bus impedance matrix. [4M]

   d) What are the methods used for reducing short circuit current. [3M]

   e) Define negative sequence and zero sequence components. [4M]

   f) Define transient stability limit and steady state stability limit. [4M]

PART –B

2 a) Form Y_{bus} for the network by direct inspection method: [8M]

Element	5-1	5-2	1-2	2-3	1-4	3-6	4-6
Positive sequence reactance	0.04	0.05	0.04	0.03	0.02	0.07	0.10

   b) Consider the system shown in Figure 1. Selecting 10,000 KVA and 110 KV as base values, find the p.u. impedance of the 200 ohm load referred to 110 KV side and 55 kV side. [8M]
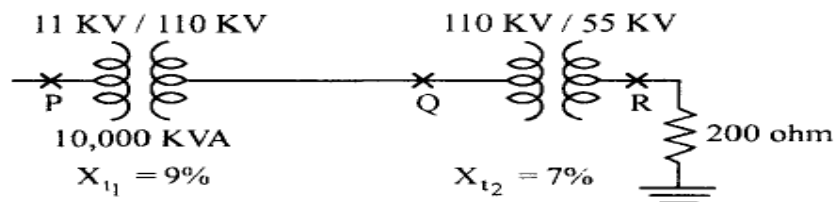

11 KV / 110 KV   110 KV / 55 KV

10,000 KVA   200 ohm
$X_{t_1} = 9\%$ $X_{t_2} = 7\%$

Figure 1

3 a) Define voltage controlled bus (generator bus/PV bus). [3M]

   b) Explain the step by step computational procedure for the Newton-Raphson method of load flow studies. [8M]

   c) Mention (any) three advantages of N-R method over G-S method. [5M]

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4   Using the building algorithm construct Z_{BUS} for the system shown in figure 2.   [16M]
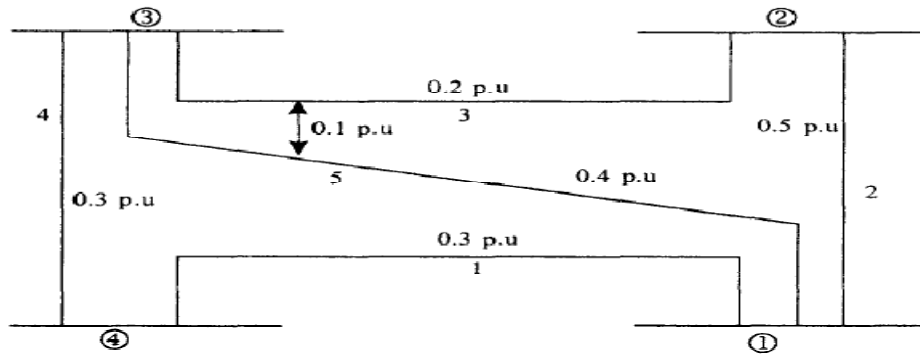Choose 4 as reference bus.

Figure 2

5   A 3-phase line operating at 11 KV and having a resistance of 1.5 ohm and reactance   [16M]
of 6 ohm is connected to a generating station bus bars through a 5 MVA step-up
transformer having reactance of 5%. The bus bars are supplied by a 12 MVA
generator having 25% reactance. Calculate the short circuit KVA fed into a
symmetric fault
     (i)   at the load end of the transformer and
     (ii)   at the H.V. terminals of the transformer.

6   a)   What are symmetrical components? Explain the symmetrical component   [8M]
transformation.

     b)   What is meant by sequence impedance? Explain the sequence network of an   [8M]
unloaded generator.

7   a)   State and explain equal area criterion. How do you apply equal area criterion to find   [8M]
the maximum additional load.

     b)   What is meant by swing curve and how is it determined? What information is   [8M]
supplied by it?

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SET - 3

III B. Tech II Semester Regular Examinations, April - 2016
POWER SYSTEM ANALYSIS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) Define the per unit terms.   [3M]

   b) What are the different types of buses in a power system?   [4M]

   c) What is the need of Z_{bus} building algorithm?   [4M]

   d) What are the assumptions made in short circuit studies of large power system network.   [3M]

   e) Write the symmetrical components of three phase system.   [4M]

   f) Define the dynamic stability and transient stability.   [4M]

PART –B

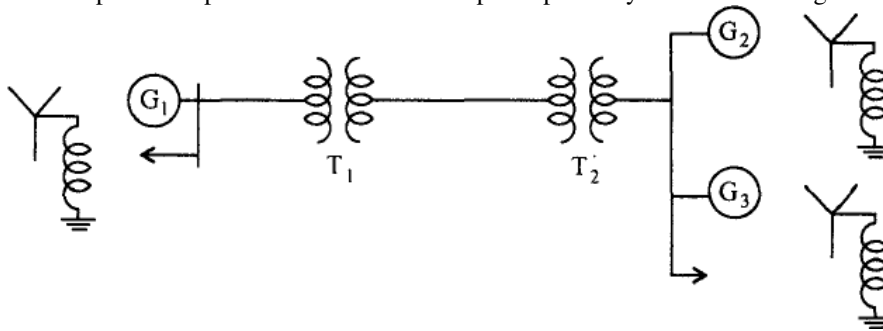2 a) Obtain the per unit representation for the three-phase power system shown in figure 1   [8M]

Figure 1

Generator 1 : 50 MVA; 10.5 KV; X = 1.8 ohm
Generator 2 : 25 MVA; 6.6 KV; X = 1.2 ohm
 Generator 3 : 35 MVA; 6.6 KV; X = 0.6 ohm
Transformer T_1 : 30 MVA; 11/66 KV; X = 15 ohm/phase
Transformer T_2 : 25 MVA; 66/6.2 KV, as h.v. side X = 12 ohms
Transmission line: X_L = 20 ohm/phase

   b) Form Y_{bus} for the network by singular transformation: [8M]

Element	5-1	5-2	1-2	2-3	1-4	3-6	4-6
Positive sequence reactance	0.04	0.05	0.04	0.03	0.02	0.07	0.10

1 of 2

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3 a) What is swing bus (slack bus/reference bus)?   [3M]

   b) Explain the step by step computational procedure for the Gauss-Seidel method of load   [8M]
       flow studies

   c) What are the advantages of Newton-Raphson method?   [5M]

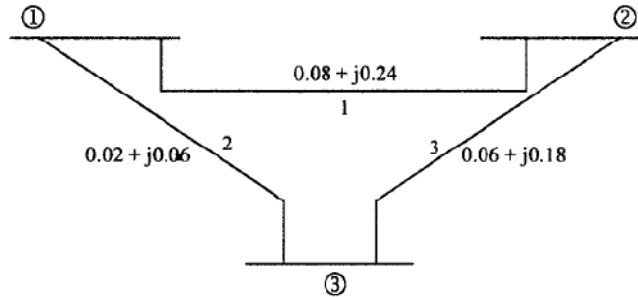4   Consider the diagram shown in figure 2. Obtain Z_{bus} by using Z_{bus} building algorithm.   [16M]

Figure 2

5 a) The short circuit MVA at the bus bars for a power plant A is 1200 MVA and for another   [8M]
       plant B is 1000 MVA at 33 KV. If these two are to be interconnected by a tie-line with
       reactance 1.2 ohm. Determine the possible short circuit MVA at both the plants.

   b) Explain the short circuit model of a synchronous machine under short circuit conditions.   [8M]

6 a) A balanced 200 V, 3 phase supply feeds balanced resistive load as shown in figure 3. If   [8M]
       the resistance R_{bc} is disconnected. Determine I_a, I_b and I_c and symmetrical components
       of I_a, I_b and I_c.

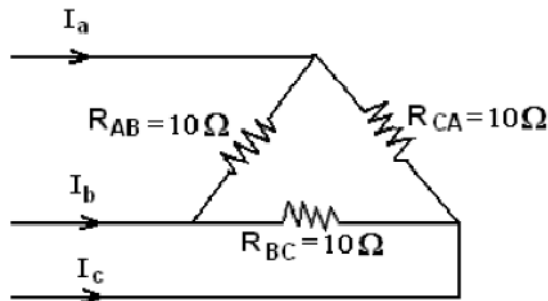**Figure 3**

   b) Derive the expression for power in terms of symmetrical components.   [8M]

7 a) Explain the equal area criterion for the stability of an alternator supplying infinite bus   [8M]
       via an inductor interconnector.

   b) Discuss the various methods for improving steady state stability.   [8M]

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III B. Tech II Semester Regular Examinations, April - 2016
POWER SYSTEM ANALYSIS
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1   a)   Give the formula to calculate base current and base impedance of a three phase system.   [3M]

   b)   List the quantities specified and quantities to be determined from the load flow study for the various types of buses.   [4M]

   c)   What are the advantages of bus impedance matrix?   [4M]

   d)   List out the differences in representing the power system for load flow and short circuit studies.   [3M]

   e)   What are symmetrical components?   [4M]

   f)   What are the methods used for improving steady state stability?   [4M]

PART –B

2   a)   Explain the importance of per-unit system.   [6M]

   b)   Determine the incidence matrices A, B, *B'*, C, *C'* and K. From that verify the following relations for the figure 1, take 1 as ground bus   [10M]
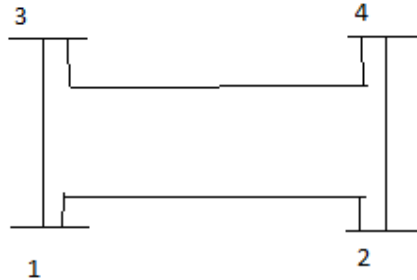(i) $C_b = -B_L^T$ (ii) $A_b K^T = U$

Figure 1

3   b)   Derive the basic equations for the load flow study using Gauss-Seidel method. With respect to this method, explain the following:
i) Acceleration factor.
ii) Handling of PV buses.   [8M]

   c)   What is Jacobian matrix? How the elements of Jacobian matrix are computed?   [8M]

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4 a) Form bus impedance matrix for the data given below.   [11M]

Element number	Bus code From bus – To bus	Self impedance
1	2-3	0.6 p.u.
2	1-3	0.5 p.u.
3	1-2	0.4 p.u.

   b) Explain the procedure for modification of Z_{bus} when a line is added or removed which has no mutual reactance.   [5M]

5 a) There are two generating stations each which an estimated short circuit KVA of 500,000 KVA and 600,000 KVA. Power is generated at 11 KV. If these two stations are interconnected through a reactor with a reactance of 0.4 ohm, what will be the short circuit KVA at each station?   [8M]

   b) What do you understand by short-circuit KVA? Explain.   [8M]

6 a) Prove that a line to ground fault at the terminals for an alternator with solidly grounded neutral is more severe than a three phase fault.   [8M]

   b) Explain the zero sequence networks of transformers with diagrams.   [8M]

7 a) Derive the swing equation for a single machine connected to infinite bus system. State the assumptions if any and state the usefulness of this equation. Neglect the damping.   [8M]

   b) Discuss the various factors affecting the transient stability of the system.   [8M]

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SET - 1

III B. Tech II Semester Regular Examinations, April - 2016
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) "If a high degree of speed control is required, d.c. is preferable to a.c. for an electric   [4M]
       drive" -Justify.
   b) What do you mean by Load Equalization?   [3M]
   c) Give the classification of electric heating methods.   [3M]
   d) Define: i) Mean spherical Candlepower, ii) Mean horizontal Candlepower.   [4M]
   e) Why a series motor is preferred for the electric traction.   [4M]
   f) What are the advantages of electric braking over mechanical braking   [4M]

PART -B

2 a) Discuss the advantages and disadvantages of electric drive over other drives.   [8M]

   b) A 200 V shunt motor has an armature resistance of 0.5 Ohm. It takes a current of 16   [8M]
      amps on full load and runs at 600 r.p.m. If a resistance of 0.5 ohm is placed in the
      armature circuit, find the ratio of the starting torque to the full load torque.

3 a) Explain in brief how heating is done in the following cases: [8M]
      i) Resistance heating,   ii) Induction heating   iii) Dielectric heating.

   b) A 20KW single-Phase, 220V resistance oven employs circular nichrome wire for its   [8M]
      heating element, if the wire temperature is not to exceed 1227^0 and the temperature
      of the charge is to be 427^0C, calculate the size and length of the wire required.
      Assume emissivity = 0.9, radiating efficiency = 0.6 and specific resistance of wire =
      1.09×10^{-6} Ω-m.

4 a) Explain the different measurement techniques used for luminous intensity.   [8M]

   b) A lamp fitted with 120 degrees angled cone reflector illuminates circular area of   [8M]
      200 metre in diameter. The illumination of the disc increases uniformly from 0.5
      metre-candle at the edge to 2 metre-candle at the centre. Determine
      i. the total light received
      ii. Average illumination of the disc
      iii. Average c.p. of the source.

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5   a)   Compare Tungsten filament lamp with Fluorescent tubes.   [8M]

    b)   Explain the different types of lighting schemes..   [8M]

6   a)   For a quadrilateral speed-time curve of an electric train, derive expression for the   [8M]
         distance between stops and speed at the end of the coasting period

    b)   A train is required to run between stations 1.6kms apart at an average speed of   [8M]
         40km/hr. The run is to be made from a quadrilateral speed-time curve. The
         acceleration is 2km/hr/sec. The coasting and braking retardations are 0.16km/hr/sec
         and 3.2km/hr/sec respectively. Determine the duration of acceleration, coasting and
         braking and the distance covered in each period.

7   a)   Briefly explain the a.c. motors used in traction.   [8M]

    b)   The scheduled speed of a trolley service is to be 53km/hr. The distance   [8M]
         between stops is 2.8km. The track is level and each stop is of 30 sec duration. Using
         simplified speed-time curve, calculate the maximum speed, assuming the
         acceleration to be 2km/hr/sec, retardation 3.2km/hr/sec, the dead weight of the car as
         16 tonnes, rotational inertia as 10% of the dead weight and track resistance as 40
         newtons/tonne. If the overall efficiency is 80%, calculate (i) the maximum power
         output from the driving axles (ii) the specific energy consumption in watt-hr/tonne-
         km.

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SET - 2

III B. Tech II Semester Regular Examinations, April - 2016
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) " Torque in a shunt motor varies with the armature current" –Justify   [4M]

   b) What are various types of electric braking used?   [4M]

   c) Discuss the various losses that occur in insulating materials   [4M]

   d) Define i)Mean hemispherical Candlepower   [3M]
           ii) Mean spherical Candlepower.
   e) What is plugging.   [3M]

   f) What is the principle of energy efficient motors.   [4M]

PART -B

2 a) Compare and contrast the slip ring and squirrel cage induction motors from the   [8M]
       application point of view.

   b) A series motor working on 500 V d.c supply runs at a speed of 1000 r.p.m. When The   [8M]
       load current is 120 amp. The resistance of the motor 0.15 ohm, of which 0.04 ohm is
       the resistance of the field. Calculate the speed of the motor when the torque is half of
       the full load torque and the field winding is connected in parallel with a diverter of
       resistance 0.08 ohm, assuming an unsaturated magnetic circuit.

3 a) What are the causes of failure in heating elements?   [5M]
   b) Six resistances each of 40 ohms are used as heating elements in furnace. Find the   [6M]
       power of the furnace for various connections to a three phase 230V supply.

   c) An electric arc furnace consuming 5kW takes 15 minutes to just melt 1.5kg of   [5M]
       aluminum, the initial temperature being 15° C. Find the efficiency of the furnace.
       Specific heat of aluminum is 0.212, melting point 658° C and latent heat of fusion
       is76.8 cal per gram.

4 a) State and explain laws of Illumination.   [8M]

   b) A lamp of 500 candle power is placed at the centre of a room, 20m×10m×5m.   [8M]
       Calculate the illumination in each corner of the floor and a point in the middle of a
       10m wall at a height of 2m from floor.

5   Give the construction and working of the following types of lamps: [16M]
       (a) Arc lamp   (b) Neon lamp   (c) Sodium lamp

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6 a) For a trapezoidal speed-time curve of an electric train, derive expression for maximum speed and distance between stops. [10M]

   b) A train is to be run between two stations 5kms apart at an average speed of 50km/hr. If the maximum speed is to be limited to 70km/hr, acceleration to 2km/hr/sec, braking retardation to 4km/hr/sec and coasting retardation to 0.1km/hr/sec, determine the speed at the end of coasting, duration of coasting period and braking period. [6M]

7 a) Write short notes on sub-traction for single-phase A.C systems. [6M]

   b) An electric locomotive is required to haul a train of 12 coaches each weighing 30 tonne on the main line service requiring an initial acceleration of 0.8km/hr/sec up a gradient of 1 in 100. Estimate the adhesive weight and hence the number of driving axles the locomotive must have, if the permissible axle loading is 20 tonne per axle. Assuming for rotational inertia to be 4%, for the coaches and 15% for the locomotive. Maximum coefficient of adhesion is 0.2 and the tractive resistance 5kg/tonne. [10M]

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SET - 3

III B. Tech II Semester Regular Examinations, April - 2016
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
      2. Answering the question in **Part-A** is compulsory
      3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What do you mean by "Individual drive" and" Group drive".	[4M]
	b)	Define Horizontal polar curve and vertical polar curve.	[4M]
	c)	What are the advantages of radiant heating?	[3M]
	d)	Discuss inverse square law.	[3M]
	e)	What are the advantages and disadvantages of electrification of track?	[4M]
	f)	Discuss why a D.C series motor is ideally suited for traction services.	[4M]

PART -B

2 a) Though a.c. is superior to d.c. for electric drives, sometimes d.c. is preferred. Give   [8M]
       the reasons and mention some of the applications.
   b) A d.c. series motor drives a load, the torque of which varies as the square of the   [8M]
       speed. The motor takes current of 30 amps, when the speed is 600 r.p.m. Determine
       the speed and current when the field winding is shunted by a diverter, the resistance
       of which is 1.5 times that of the field winding. The losses may be neglected.

3 a) What are various types of electric braking used?   [8M]
   b) Explain how rheostatic braking is done in D.C. shunt motors and series motors.   [8M]

4   Write short notes on :   [8M]
   a) High pressure mercury vapour lamp
   b) Mercury fluorescent lamp.   [8M]

5 a) Explain the various types of lighting schemes with relevant diagrams.   [10M]
   b) Briefly explain the various laboratory standards used in Illumination.   [6M]

6   Write a brief notes on the single phase a.c. series motor and comment upon it's   [16M]
       suitability for traction services. How is it performance compared with the d.c. series
       motor?

7 a) Explain the specific energy consumption for given run.   [8M]
   b) An electric train weighing 200 tonne has 8 motors geared to driving wheels, each   [8M]
       wheel is of 80cms diameter. Determine the torque developed by each motor to
       accelerate the train to a speed of 48km/hr in 30seconds up a gradient of 1 in 200. The
       tractive resistance of 50newtons/tonne, the effect of rotational inertia is 10% of the
       train weight, the gear ratio is 4 in 1 and gearing efficiency is 80%.

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(SET - 4)

III B. Tech II Semester Regular Examinations, April - 2016
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 hours   Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1 a) What are the various factors that govern the choice of a motor for a given service?   [3M]

   b) What are different methods of heat transfer?   [4M]

   c) Define: i) Luminous intensity, ii) Luminous Flux.   [4M]

   d)   Give some applications of induction heating.   [3M]

   e) What are the requirements of an ideal traction system?   [4M]

   f) Define specific energy output and specific energy consumption.   [4M]

PART -B

2 a) Explain what do you mean by "Individual drive" and "Group drive ". Discuss their   [8M]
       relative merits and demerits.

   b) A 500 V d.c. series motor runs at 500 r.p.m. and takes 60 amps. The resistances of   [8M]
       the field and the armature are 0.3 and 0.2 Ohms, respectively. Calculate the value of
       the resistance to be shunted with the series field winding in order that the speed may
       be increased to 600 r.p.m., if the torque were to remain constant. Saturation may be
       neglected.

3 a) What are the factors to be considered for inductor design in induction heating?   [8M]

   b)   Give some applications of induction heating.   [8M]

4 a) Explain with sketches the constructional features of a filament lamp.   [10M]

   b) A lamp of 500 candle power is placed at the centre of a room, 20m x 10m x 5m.   [6M]
       Calculate the illumination in each corner of the floor and a point in the middle of a
       10m wall at a height of 2m from floor.

5 a) Discuss the flood lighting with suitable diagrams.   [6M]

   b) Along the center of a line of a corridor, number of lamps is fitted with reflectors. The   [10M]
       distance between the two adjacent lamps is 7.5cm and the height of each lamp from
       the floor is 5m. The candlepower of each lamp is 100 in all directions below the
       horizontal. Determine the maximum and minimum illumination along the centerline
       of the floor and draw a graph showing the variation of the illumination along this line
       between the two lamps.

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6 a) Draw the speed-time curve of a suburban service train and explain [8M]

   b) A train accelerates to a speed of 48km/hr in 24sec. Then it coasts for 69sec under a constant resistance of 58 newton / tonne and brakes are applied at 3.3km/hr/sec in 11sec. calculate (i) the acceleration (ii) the coasting retardation (iii) the scheduled speed if station stoppage is 20secs. What is the effect of scheduled speed if station stoppage is reduced to 15sec duration, other conditions remaining same? Allow 10% for rotational inertia. [8M]

7 a) Explain dead weight, accelerating weight and train resistance referred to traction. [6M]

   b) An electric locomotive of 100 tonne can just accelerate a train of 500 tonne (trailing weight) with an acceleration of 1km/hr/sec on an up gradient 1 in 1000. Tractive resistance of the track is 45 newton/tonne and the rotational inertia is 10%. If this locomotive is helped by another locomotive of 120 tonne, find [10M]
   i) the trailing weight that can be hauled up the same gradient, under the same condition
   ii) the maximum gradient, the trailing hauled load remaining unchanged. Assume adhesive weight expressed as percentage of total dead weight to be same for both the locomotives.

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