

Enrollment No.....

Bachelor of Engineering
Fifth Semester Main Examination, December 2021
Microprocessors and Microcontrollers [EX-503]
Branch-EX

Time: 3:00 Hrs

Max Marks 70

Note : Attempt any five questions. All questions carry equal marks.
Assume suitable data if necessary & state them clearly.

- Q.1 (a) Explain the instruction set of 8086 microprocessor.
(b) How does 8086 microprocessor differ from 80286 and 80386 ? Show the comparative study.
- Q.2 (a) Draw and explain flag register and stack structure of 8086 microprocessor.
(b) Draw real cycle timing diagram for minimum mode of 8086 microprocessor.
- Q.3 (a) Draw the block diagram of 8254 and explain the function of each block .
(b) Explain different DMA controller 8257 modes.
- Q.4 (a) List and explain various addressing modes of 8051. Also Give example of each mode.
(b) Describe interrupt structure and interrupt priorities of 8051.
- Q.5 (a) Write and Explain 8051 ALP to run the stepper. motor in both forward and reverse direction with delay.
(b) Write notes on 8051 serial port programming .
- Q.6 (a) How will you connect 8051 microcontroller to Rs - 232 Explain .
(b) Write short notes on USART 8251.
- Q.7 (a) Write a program to generate square wave using programmable peripheral interface chip.
(b) Explain successive approximation A/D.

- Q.8 (a) Explain meaning of control word of 8255 and explain its modes of operation.
- (b) write short notes on :-
- i) Memory mapped I/O and peripherals I/O.
 - ii) 8051 based thyristor firing circuit

Bachelor of Engineering
Fifth Semester Main Examination, December-2021
Power Electronics [EX-504]
Branch- EX

Time: 3:00 Hrs**Max Marks 70****Note : Attempt any five questions. All questions carry equal marks.**

- Q.1 (a) Draw the block diagram and explain the operation of SMPS which can be employed for low power applications and other for high power application.
(b) Draw and explain the operation of single phase half wave convertor derive and also draw the related voltage and current waveforms.
- Q.2 (a) Explain the principle of operation of IGBT with its switching characteristics
(b) Explain the principle of operation of MOSFET with its switching characteristics .
- Q.3 (a) What is meant by rectification mode and inversion mode in single phase fully controlled converter .
(b) What is the function of operation of SCR with its switching characteristics.
- Q.4 (a) What is the function of freewheeling diodes in controlled rectifier.
(b) Explain the different type of over current and over voltage protection in SCR.
- Q.5 (a) Explain the operation of step down and step up chopper with duty cycle and derive its output equation.
(b) What are the advantages and disadvantages of load commutated chopper.
- Q.6 (a) Explain the operation of 180 degree mode three phase voltage source inverter (VSI).
(b) Discuss the principle operation of single phase commutated CSI with R load and single phase auto commutated inverter.
- Q.7 (a) Briefly discuss about relative power compensation.
(b) Explain the operation of modified McMurray half bridge inverter.
- Q.8 (a) Explain the operation of voltage commutated chopper and current commutated chopper.
(b) Define circuit turn of time. Why circuit turn of time. Should be greater than the thyristors turn off time.

Bachelor of Engineering
Fifth Semester Main Examination, December 2021
Energy Conservation & Management [EX-505]
Branch- EX

Time: 3:00 Hrs

Max Marks 70

Note : Attempt any five questions. All questions carry equal marks.
Assume suitable data if necessary & state them clearly.

- Q.1 (a) Explain briefly the difference between preliminary and detailed energy Audits?
(b) What are the various steps in the implementation of detailed energy management in an organization?
- Q.2 (a) What are the benefits of benchmarking energy consumption?
(b) State the importance of energy policy for industry?
- Q.3 (a) What is role of an ESCO?
(b) What do you understand by term "COP" and explain its role?
- Q.4 (a) What is the significance of pre-heating furnace oil before burning?
(b) What is the relation between RPM (Speed) and frequency of an induction motor?
- Q.5 (a) Discuss list of factors affecting energy efficiency of electric motors?
(b) Explain the different types of tariffs used for electricity consumers.
- Q.6 (a) Write the benefits of the energy conservation in detail.
(b) Explain energy conservation in transportation system.
- Q.7 (a) Explain the demand side management in power system?
(b) What is power futures? Write power tutor improvement methods in detail.

Q.8 Write short note on any two of following

- a) Energy conservation in Textiles industry.
- b) Energy conservation in sugar industry.
- c) Energy auditing instruments.
- d) Energy efficient motor V.S.D. power factor improvement in power system.
- e) Electrical energy conservation in building.

Enrollment No.....

Bachelor of Engineering
Fifth Semester Examination, December 2021
Utilisation of Electrical Energy [EX501T]
Branch- EX

Time: 3:00 Hrs

Max Marks 70

Note : 1. Attempt any five questions out of eight.

2. All question carry equal marks.

3. Assume suitable data if necessary & state them clearly.

- Q.1 (a) Define following terms: solid angle, luminous efficiency and cosine law.
(b) Draw the circuit diagram for tube light connection having choke and stator.
- Q.2 (a) Explain Arc furnaces transformers and welding transformers.
(b) Explain laws of electrolysis and define electroplating.
- Q.3 (a) Explain different system of electric traction and their advantages and disadvantages.
(b) Explain all mechanics of train movement with speed time curve.
- Q.4 (a) Explain vehicle performance and energy consumption.
(b) Explain configuration and performance of electrical vehicles.
- Q.5 (a) Explain adhesive weight and coefficient of adhesion.
(b) What is electrical heating? Explain methods of electrical heating. Write advantages and applications of electrical heating.
- Q.6 (a) Write short notes on:
i) Incandescent lamp
ii) Fluorescent lamp
(b) Define individual and collective drives.
- Q.7 (a) Explain resistance welding and arc welding. Write electrical equipment for them.
(b) Explain load equalization of electrical bracking.
- Q.8 (a) Explain refrigeration and air conditioning.
(b) Explain traction motor characteristics.

Bachelor of Engineering
Fifth Semester Main Examination, December 2021
Electrical Machine- II [EX-502]
Branch-EX

Time: 3:00 Hrs

Max Marks 70

Note : (i) Attempt any five questions out of eight.
(ii) All questions carry equal marks.

- Q.1 (a) Explain in details working principle and e.m.f. equation of DC Machine?
- (b) What are the limitation of generalized theory of electrical machines?
- Q.2 (a) What types of permanent magnet materials are used for permanent magnet D.C. motors? state their properties and applications
- (b) Explain the operation of a commutation process with neat diagram?
- Q.3 (a) Describe the procedure of slip test to determine the ration X_d/X_q .
- (b) What is short circuit Ratio (SCR)? How is it related of synchronous reactance?
- Q.4 (a) What are the methods of starting a synchronous motor? Explain one method in details. Draw the necessary diagram?
- (b) Explain Swinburne's test and Hopkinson's test of D.C. motor?

- Q.5 (a) Draw and explain the phaser diagrams of a 3-phase synchronous motor where
- (i) It is overexcited
 - (ii) It is underexcited.
- (b) Describe the construction of PMDC motor? what are advantages and disadvantages of permanent magnet D.C. motors compared with conventional D.C. shunt motor?
- Q.6 (a) Explain briefly V Curves and inverted C-curves of synchronous motor?
- (b) Explain different types of starter in D.C. motor? Why is starter necessary for D.C. motor?
- Q.7 (a) Explain voltage regulation of alternator using synchronous impedance method.
- (b) Explain armature reaction and methods of living armature reaction.
- Q.8 Write short notes on any two of the following
- a) A.C. servo motor
 - b) Brushless D.C. motor
 - c) Metadyne transformer
 - d) Hysterisis motor
 - e) Hunting and damping winding.