MODEL PAPER – FORMATIVE ASSESSMENT-1

C-23-EE-404

BOARD DIPLOMA EXAMINATION, (C-23)

DEEE – IV SEMESTER EXAMINATION

EE-404, POWER ELECTRONICS AND PLC

Time: 90 Minutes Total Marks: 40

PART – A **(1 x 4) + (4 x 3) = 16M**

Answer all five questions. First question carries 4 marks and remaining questions carries 3 marks

1. a) Draw the ISI circuit symbol for LASCR. (CO1)
   b) IGBT has the capability of handling very high voltage than MOSFET. State true or false. (CO2)
   c) Inverter is device which converts _____. (CO3)
   d) A chopper is a device that converts fixed DC input to a variable DC output voltage. State true
   or false. (CO3)
2. List the applications of SCR. (CO1)
3. List the applications of MOSFET. (CO2)
4. State the need of freewheeling diode in converters. (CO3)
5. Classify different types of inverters. (CO3)

PART – B **3 X 8 = 24M**

Answer all three questions. Each question carries 8 marks

6. a) Explain the working of SCR and draw its V-I characteristics. (CO1)
   (or)
   b) Explain class C (complementary) communication of SCR with neat diagram. (CO1)

7. a) Explain the operation of IGBT and state its applications. (CO2)
   (or)
   b) Explain the working of Power MOSFET and draw its characteristics. (CO2)

8. a) Explain the working of single-phase full-wave fully-controlled converter with RL load along with neat waveforms. (CO3)
   (or)
   b) Explain the working of a single phase bridge inverter with a neat sketch. (CO3)

MODEL PAPER – FORMATIVE ASSESSMENT-2

C-23-EE-404

BOARD DIPLOMA EXAMINATION, (C-23)

DEEE – IV SEMESTER EXAMINATION

EE-404, POWER ELECTRONICS AND PLC

Time: 90 Minutes Total Marks: 40

PART – A **(1 x 4) + (4 x 3) = 16M**

Answer all five questions. First question carries 4 marks and remaining questions carries 3 marks

1. a) Anti theft alarm circuit can be designed using SCR. State true or false. (CO4)
   b) The speed of a DC shunt motor can be controlled by_____. (CO4)

   c) Logic gate used in Ladder Diagram of DOL Starter is OR gate. State true or false. (CO5)
   d) Abbreviation of SCADA is _____. (CO5)

2. List the factors affecting speed of a DC Motor. (CO4)
3. List the devices used to suppress the spikes in supply system. (CO4)
4. Draw ladder diagram for AND, OR and NOT gates. (CO5)
5. State any three applications of PLC. (CO5)

PART – B **3 X 8 = 24M**

Answer all three questions. Each question carries 8 marks

6. a) Explain the speed control of PMDC motor by using converters. (CO4)

   (or)

   b) Explain the illumination control circuit using TRIAC and DIAC with a neat sketch. (CO4)

7. a) Draw the block diagram of PLC and Explain the purpose of each part. (CO5)

   (or)

   b) Draw the ladder diagram for star-delta starter and write its operation in brief. (CO5)

8. a) Explain count up instruction (CTU) of counters used in ladder diagrams. (CO5)

   (or)

   b) Explain the speed control of induction motor by using converter and inverter. (CO4)

C23-EE-404

SUMMATIVE ASSESSMENT

BOARD DIPLOMA EXAMINATION, (C-23)

MODEL QUESTION PAPER

DEEE - FOURTH SEMESTER EXAMINATION

POWER ELECTRONICS AND PLC

Time: 3 hours **Total Marks : 80**

PART-A **10 X 3 =30**

Instructions:

(i) Answer all questions.

(ii) Each question carries three marks.

(iii) Answer should be brief and straight to the point and shall not exceed five simple sentences.

1. Draw the symbols of the following :
   (a) GTO SCR
   (b) SUS
   (c) LASCR
2. Define turn-on time and turn-off time of SCR.
3. Compare MOSFET and IGBT in any three aspects.
4. Define an inverter and state any four applications.
5. Define Chopper and Cyclo converter.
6. State the need for free wheeling diode.
7. List any three devices used to suppress spikes in power supply system.
8. State the factors affecting the speed of dc motors.
9. Draw ladder diagram for NAND gate and NOR gate.
10. Draw the block diagram of PLC and label its parts.

PART – B **5 X 10 = 50**

Instructions:

(i) Answer any five questions.

(ii) Each question carries ten marks.

(iii) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Explain the construction and working of SCR with neat diagrams.
12. Explain complementary and natural commutation of SCR with the help of a neat circuit sketch.
13. Explain the working of Power MOSFET and draw its characteristics.
14. Explain the working of single-phase full-wave fully-controlled converter with resistive load along with neat waveforms.
15. Explain the working of three phase bridge inverter.
16. Explain the speed control of 3-phase induction motor by using voltage-frequency (V/F) control.
17. Explain the working of UPS with a neat block diagram.
18. Explain the ladder diagram of DOL starter with neat diagram.