S.No. 5339 16 SCCEL 8

(For candidates admitted from 2016–2017 onwards)

B.Sc. DEGREE EXAMINATION, APRIL 2022.

Part III — Electronics — Major

POWER ELECTRONICS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20)

Answer ALL questions.

1. List the advantages of IGBT.

2. What is meant by thyristor converter system?

3. What is meant by phase controlled rectifier?

4. Mention some of the applications of controlled rectifiers.

5. What is Chopper?

6. List the advantages of dc chopper.

7. What are inverters, list its applications?

8. How inverters are classified based on the commutation circuitry?

9. Define Flyback Converter.

10. List the advantages of push pull converter.

SECTION B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the construction, and working principle of gate triggering circuits.

Or

(b) Explain about the dV/dt protection in an SCR.

12. (a) Explain the operation of single-phase full controlled rectifier feeding RL load.

Or

(b) Explain the operation of single-phase half controlled rectifier feeding R load.

13. (a) Draw and explain the operation of step-up choppers.

Or

(b) Differentiate between step-up and step-down choppers

14. (a) Explain the operation of single phase half bridge inverter with aid of relevant waveforms.

Or

(b) Explain three phase 180 degree conduction mode of inverter.

15. (a) Draw and explain the function of Single phase AC switches.

Or

(b) Describe DC solid state relays.

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

16. Explain the construction, operation and switching characteristics at MOSFET.

17. Explain the principle operation of single phase semi converters.

18. With the aid of power circuit explain the Class A to Class E copper configurations.

19. Draw and explain the function of Current source inverter with ideal switches.

20. Draw and explain the design of static switches.