1. What are the three main parts of an adjustable-speed, DC, solid-state drive?

2. What type of DC motor is used for a DC adjustable-speed drive?

3. What is the purpose of the control panel for a DC adjustable-speed drive?

4. What two values are used to calculate the error signal in the control panel for an adjustable-speed, solid-state controller?

5. What are the two regulator circuits in a control panel to protect a DC motor?

6. What is the purpose of the “speed reference signal”?

7. What is controlled by the “current error signal” in a DC adjustable-speed drive?

8. What is housed in the control panel for a DC adjustable-speed drive? (Other than the regulatory circuitry and power converters)

9. What is typically found in the operator’s control station for a DC adjustable-speed drive?

10. What are the main considerations when installing a control cabinet for a DC adjustable-speed drive?

11. What precautions should be taken with control and signal cables for a DC adjustable-speed drive?

12. How should cable shield screens be grounded?

**Task 2**

13. What is the operating principle of a diode?

14. How is the demand on filter circuits minimized for a DC adjustable-speed drive?

15. What two circumstances will cause an SCR to conduct current in a forward direction?

16. How is a conducting SCR turned off?

17. What are the advantages of three-phase input supply for a DC adjustable-speed drive?
18. What is the purpose of the free-wheeling diode in a single-phase, full-wave, semi-converter?

19. What change must be made in semi-converters to allow full control of the output voltage from 0 Volts to a maximum?

20. How are the firing angles of SCRs controlled?

21. What is the purpose of a pulse transformer?

22. What is a stabilized DC shunt motor?

23. How are DC motors rated for compatibility to a power converter?

24. What is the difference between a semi-converter and a full converter?

25. How are the terminals for the series winding, shunt winding, armature and overload labeled on a motor for a DC adjustable-speed drive?

26. Describe the two types of braking for a motor used with a DC adjustable-speed drive.

27. How are DC motors typically reversed?

28. What is the purpose of an anti-plugging relay in a DC adjustable-speed drive?

29. What types of protection are required for a DC motor operated by a DC adjustable-speed drive?

30. What are the three basic steps to starting and adjusting a motor connected to a DC adjustable-speed drive?

31. What type of feedback is required when a tachometer is used for feedback signals for a DC adjustable-speed drive?

32. What devices are required for troubleshooting a DC motor and a DC adjustable-speed drive?

Unit 2

1. What are the four main parts of a variable-frequency AC drive?

2. How is the DC output voltage adjusted in the DC power section of a variable-frequency AC drive?
3. What are the two types of filters used in the filter section of a variable-frequency AC drive?

4. What two properties of the power are regulated in the inverter of the AC power section to supply the proper frequency, voltage and phase sequence output.

5. What does the speed of an AC motor depend on?

6. How is the torque to speed curve maintained in an AC motor with a variable-frequency AC drive?

7. What are the three basic inverter schemes for controlling voltage and current as the frequency of the motor changes?

8. What is the minimum and maximum ambient temperature for installing a control panel?

9. How is interference from the inverter minimized?

10. What precautions should be taken before working in a control panel?

11. Why is a megger not recommended for testing inside a control panel for a variable-frequency AC drive?

12. What is the most common problem with a variable-frequency AC drive that is not working?

13. How is the shaft speed of a motor measured?

14. What is the most likely cause of the motor acceleration or deceleration being rough?

Task 2

15. What type of wave is produced by a simple mechanical switch inverter?

16. What device acts like the switch (previous question) in a single-phase bridge rectifier?

17. How is reactive energy from an inductive load dissipated in a bridge rectifier?

18. What is a six step inverter?

19. What factor controls the frequency output from the inverter section in a variable-frequency AC drive control using VVI?
20. Why are “CSI” drives more reliable than “VVI” drives?

21. Which type of drive system overcomes the disadvantages of “CSI” and “VVI”?

22. How is the amplitude of inverter output voltage controlled using a “PWM” drive system?

23. What does the torque of a typical AC motor depend on?

24. How is the speed of an AC motor typically affected from no-load to full-load?

25. What are three methods of keeping motor from overheating when it is operated at full load and reduced speed?

26. What ratio has to be maintained to have constant stator flux in an AC motor operated at different speeds?

27. What is the result of operating an AC motor above rated speed when the voltage cannot be increased?


29. How do you reverse a three-phase AC motor simply with a variable-frequency drive?