



قائمة الاسئلة

الالكترونيات القوى - كلية الهندسة - قسم الكهرباء- المستوى الثالث - ..التخصص قوى والات-..الزمن: ثلاث ساعات- درجة هذا الاختبار (50)
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- 1) An ideal power diode must have
- low forward current carrying capacity
 - large reverse breakdown voltage
 - high ohmic junction resistance
 - high reverse recovery time

- a
- b
- c
- d

- 2) For a p-n junction diode, the peak inverse current & the reverse recovery time are dependent on
- inverse voltage
 - forward Voltage
 - di/dt
 - all of the above mentioned

- a
- b
- c
- d

- 3) Choose the false statement.
- SCR is a bidirectional device
 - SCR is a controlled device
 - In SCR the gate is the controlling terminal
 - SCR are used for high-power applications

- a
- b
- c
- d

- 4) For an SCR in the forward blocking mode (practically)
- Leakage current does not flow
 - Leakage current flows from anode to cathode
 - Leakage current flows from cathode to anode
 - Leakage current flows from gate to anode

- a
- b
- c



- 4) - d
- 5) For the SCR to remain in the ON (conducting) state
- a) Gate signal is continuously required
 - b) No continuous gate signal is required
 - c) No forward anode-cathode voltage is required
 - d) Negative gate signal is continuously required
- 1) - a
- 2) + b
- 3) - c
- 4) - d
- 6) In a half-wave rectifier, the
- a) current & voltage both are bi-directional
 - b) current & voltage both are uni-directional
 - c) current is always uni-directional but the voltage can be bi-directional or uni-directional
 - d) current can be bi-directional or uni-directional but the voltage is always uni-directional
- 1) - a
- 2) - b
- 3) + c
- 4) - d
- 7) A 1-phase 230V, 1KW heater is connected across a 1-phase HW rectifier (diode based). The power delivered to the heater is
- a) 300 W
 - b) 400 W
 - c) 500 W
 - d) 600 W
- 1) - a
- 2) - b
- 3) + c
- 4) - d
- 8) A single-phase full wave rectifier is a
- a) single pulse rectifier
 - b) multiple pulse rectifier
 - c) two pulse rectifier
 - d) three pulse rectifier
- 1) - a
- 2) - b
- 3) + c
- 4) - d
- 9)





For a single phase, full bridge, diode rectifier excited from a 230 V, 50 Hz source. With $R = 10 \Omega$ & the inductance(L) large enough to maintain continuous conduction, the average and rms values of diode currents will be

- a) 7.85 A, 8 A
- b) 10.35 A, 7.85 A
- c) 10.35 A, 14.6 A
- d) 8 A, 8 A

- 1) - a
- 2) - b
- 3) + c
- 4) - d

10) A 3-phase bridge rectifier charges a 240 V battery. The rectifier is given a 3-phase, 230 V supply. The current limiting resistance in series with the battery is of 8Ω . Find the average value of battery charging current.

- a) 12.56 A
- b) 8.82 A
- c) 9.69 A
- d) 6.54 A

- 1) - a
- 2) + b
- 3) - c
- 4) - d

11) The current ripple factor (CRF) is the ratio of

- a) Average value/RMS value
- b) RMS value/Average value
- c) Average value/Maximum value
- d) Maximum value/RMS value

- 1) - a
- 2) + b
- 3) - c
- 4) - d

12) .In a single pulse semi-converter using two SCRs, the triggering circuit must produce

- a) two firing pulses in each half cycle
- b) one firing pulse in each half cycle
- c) three firing pulses in each cycle
- d) one firing pulse in each cycle

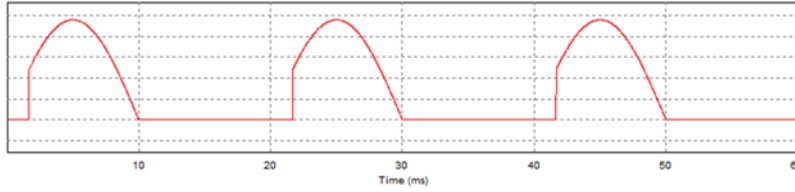
- 1) - a
- 2) + b
- 3) - c
- 4) - d

13)





.For a certain SCR configuration, the below shown waveform is obtained.
Find the value of the average output voltage with $\alpha = 30^\circ$ & $V_s = 240$ V.



- a) 50.27 V
- b) 100.8 V
- c) 140 V
- d) 120 V

- 1) - a
- 2) b
- 3) - c
- 4) - d

14) In a single-phase half-wave circuit with RL load and a freewheeling diode, the load voltage during the freewheeling period will be

- a) zero
- b) positive
- c) negative
- d) positive than negative

- 1) a
- 2) - b
- 3) - c
- 4) - d

15) A single-phase half-wave rectifier with a FD is supplied by $V_s = 240$ V, 50 Hz, AC source with a load $R = 10 \Omega$, $L = 0.8$ mH. The firing angle is so adjusted such that the output voltage obtained is 100 V. Find the firing angle.

- a) 62°
- b) 102°
- c) 31°
- d) 47°

- 1) - a
- 2) - b
- 3) c
- 4) - d

16) A single-phase full controlled converted with RLE load will act like a line-commutated inverter when the firing angle α

- a) $\alpha > 180^\circ$
- b) $\alpha > 90^\circ$
- c) $\alpha < 90^\circ$
- d) $\alpha = 90^\circ$

- 1) - a
- 2) b
- 3) - c



- 4) - d
- 17) In case of controlled rectifiers, the nature of the load current (continuous or discontinuous) depends upon the
- type of load and firing angle
 - only on the type of load
 - only on the firing angle
 - it is independent of all the parameters
- 1) + a
- 2) - b
- 3) - c
- 4) - d
- 18) A three-phase full converter charges a battery from a three-phase supply of 230 V. The battery emf is 200 V and the internal resistance of the battery is 0.5Ω . Find the value of the continuous current which is flowing through the battery if its terminal voltage is 210 V
- 10 A
 - 20 A
 - 0.5 A
 - 25 A
- 1) - a
- 2) + b
- 3) - c
- 4) - d
- 19) A three-phase full converter charges a battery from a three-phase supply of 230 V. Find the value of the power delivered to the load if a continuous current of 20A is flowing through the battery of emf 200 V and internal resistance of 0.5Ω .
- 0 W
 - 5600 W
 - 4200 W
 - 1040 W
- 1) - a
- 2) - b
- 3) + c
- 4) - d
- 20) A three-phase semi-converter circuit is given a supply of 400 V. It produces at the output terminals an average voltage of 381 V. Find the rectification efficiency of the converter circuit.
- 99.65 %
 - 95.25 %
 - 91 %
 - 86.5 %
- 1) - a
- 2) + b
- 3) - c
- 4) - d





21) Each SCR of a 3-phase 6-pulse converter conducts for

- a) 120 degrees
- b) 60 degrees
- c) 180 degrees
- d) 360 degrees

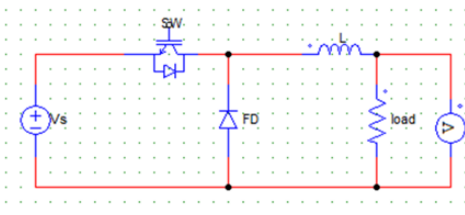
- 1) a
- 2) b
- 3) c
- 4) d

22) The four quadrant operation of dual converters can be obtained by

- a) Moving the mechanical lever
- b) Adding inductance to the circuit
- c) Changing the firing angle value
- d) None of the mentioned

- 1) a
- 2) b
- 3) c
- 4) d

23) In the below given circuit, when switch (SW) is off



If a step up chopper's switch is always kept off then (ideally)

- a) $V_o = 0$
- b) $V_o = \infty$
- c) $V_o = V_s$
- d) $V_o > V_s$

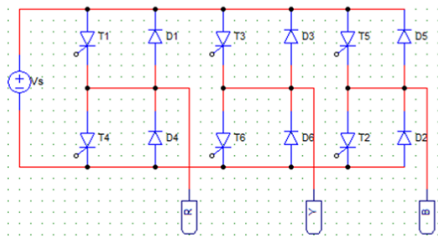
- 1) a
- 2) b
- 3) c
- 4) d

24)





For a three phase bridge inverter in the 180° mode, _____ devices are conducting from 120° to 180°.

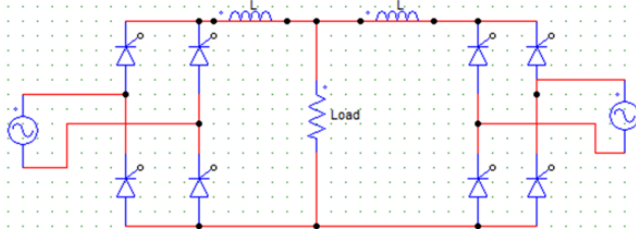


Three-phase bridge thyristor inverter used as the switching device

- a. T1, T6, T5
- b. T2, T6, T5
- c. T1, T6, T5
- d. T1, T2, T3

- 1) - a
- 2) - b
- 3) - c
- 4) d

25) Name the circuit shown in the figure below.



- a) Single-phase circulating current type dual converter
- b) Single-phase non-circulating current type dual converter
- c) Three-phase circulating current type dual converter
- d) None of the mentioned

- 1) - a
- 2) - b
- 3) - c
- 4) d

