

Program: BE Electronics Engineering  
Curriculum Scheme: Revised 2012  
Examination: Third Year Semester VI  
Course Code: EXC 604 and Course Name: Power Electronics I

Time: 1 hour

Max. Marks: 50

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Note to the students: - All the Questions are compulsory and carry equal marks.

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| Q1.       | In the normal operation of an SCR, anode is .....with respect to cathode  |
| Option A: | At zero potential   |
| Option B: | Negative  |
| Option C: | Positive  |
| Option D: | Same potential  |
|           |   |
| Q2.       | In normal operation of an SCR, gate is ..... with respect to cathode  |
| Option A: | Positive  |
| Option B: | Negative  |
| Option C: | At zero potential   |
| Option D: | Same potential  |
|           |   |
| Q3.       | SCR has three terminals .....   |
| Option A: | Cathode, anode, gate  |
| Option B: | Anode, cathode, grid  |
| Option C: | Anode, cathode, drain   |
| Option D: | Source, drain, gate   |
|           |   |
| Q4.       | An advantage of full wave bridge rectification is.....  |
| Option A: | it uses the whole transformer secondary for the entire ac input cycle   |
| Option B: | it costs less than other rectifier types  |
| Option C: | it cuts off half of the ac wave cycle   |
| Option D: | it never needs a filter   |
|           |   |
| Q5.       | A full-wave fully controlled bridge has a highly inductive load with a resistance of 55 Ohm, and a supply of 110V at 50Hz. The value of load power for a firing angle $\alpha=75^\circ$ is..... |
| Option A: | 10W   |
| Option B: | 11W   |
| Option C: | 10.5W   |
| Option D: | 10.9W   |
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| Q6.       | The load voltage of a chopper can be controlled by varying the.....   |
| Option A: | duty cycle  |
| Option B: | firing angle  |
| Option C: | reactor position  |
| Option D: | extinction angle  |
|           |   |
| Q7.       | In the PWM method   |
| Option A: | external commutating capacitors are required  |
| Option B: | more average output voltage can be obtained   |
| Option C: | lower order harmonics are minimized   |
| Option D: | higher order harmonics are minimized  |
|           |   |
| Q8.       | A single phase full bridge inverter circuit, has load $R = 2 \Omega$ and dc source $V_s = 230 \text{ V}$ . Find the value of power delivered to the load in watts only due to the fundamental component of the load current.                  |
| Option A: | 5361.5 W  |
| Option B: | 2142.5 W  |
| Option C: | 21424.5 W   |
| Option D: | 214.2 W   |
|           |   |
| Q9.       | The best rectifier circuit for the power supply designed to provide high power at low voltage is.....   |
| Option A: | half wave arrangement   |
| Option B: | full wave, centre tap arrangement   |
| Option C: | quarter wave arrangement  |
| Option D: | voltage doubler arrangement   |
|           |   |
| Q10.      | Consider the following statement in respect to IGBT:<br>(1) It combines the attributes of MOSFET and BJT<br>(2) It has low forward voltage drop<br>(3) It's switching speed is very much lower than MOSFET<br>(4) It has high input impedance |
| Option A: | 1, 2, 3 and 4   |
| Option B: | 1, 2 and 4 only   |
| Option C: | 1, 2 and 3 only   |
| Option D: | 3 and 4 only  |
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| Q11.      | If a half wave rectifier is used with 165Vpk AC input, the effective dc output voltage is.....  |
| Option A: | considerably less than 165V   |

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| Option B: | slightly less than 165V  |
| Option C: | exactly 165V   |
| Option D: | slightly more than 165V  |
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| Q12.      | Which semiconductor power device, out of the following, is not a current triggered device?   |
| Option A: | Thyristor  |
| Option B: | GTO  |
| Option C: | TRIAC  |
| Option D: | MOSFET   |
|           |  |
| Q13.      | SCR is a.....  |
| Option A: | Bidirectional switch   |
| Option B: | Two terminal device  |
| Option C: | Three layer device   |
| Option D: | Three junction device  |
|           |  |
| Q14.      | In a step down chopper, if $V_s = 100$ V and the chopper is operated at a duty cycle of 75 %. Find the output voltage.   |
| Option A: | 100 V  |
| Option B: | 75 V   |
| Option C: | 25 V   |
| Option D: | 50V  |
|           |  |
| Q15.      | A three-phase half-wave controlled converter is fed from a 3-phase, 400 V source and is connected to a load which takes a constant current of 36 A. Find, the value of average output voltage and average current rating of SCR for a firing angle of $30^\circ$ . |
| Option A: | 234 V, 36 A  |
| Option B: | 234 V, 12 A  |
| Option C: | 135 V, 36 A  |
| Option D: | 135 V, 12 A  |
|           |  |
| Q16.      | A thyristor (SCR) is a.....  |
| Option A: | P-N-P device   |
| Option B: | N-P-N device   |
| Option C: | P-N-P-N device   |
| Option D: | P-N device   |
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| Q17.      | If a step up chopper's switch is always kept off then (ideally)..... |
| Option A: | $V_o = 0$  |
| Option B: | $V_o = \infty$   |
| Option C: | $V_o = V_s$  |
| Option D: | $V_o > V_s$  |
|           |  |
| Q18.      | A Triac has three terminals  |
| Option A: | Drain, Source and Gate   |
| Option B: | Two main terminals and Gate  |
| Option C: | Anode, cathode and Gate  |
| Option D: | Emitter, base and collector  |
|           |  |
| Q19.      | Which device performs DC to DC conversion?                           |
| Option A: | Inverter   |
| Option B: | Chopper  |
| Option C: | Switch   |
| Option D: | Rectifier  |
|           |  |
| Q20.      | The GTO can be turned off.....                                       |
| Option A: | by a positive gate pulse   |
| Option B: | by a negative gate pulse   |
| Option C: | by a negative anode-cathode voltage                                  |
| Option D: | by removing the gate pulse   |
|           |  |
| Q21.      | The three terminals of the IGBT are.....                             |
| Option A: | base, emitter & collector  |
| Option B: | gate, source & drain   |
| Option C: | gate, emitter & collector  |
| Option D: | base, source & drain   |
|           |  |
| Q22.      | In a resistance firing circuit the firing angle.....                 |
| Option A: | cannot be greater than $120^\circ$                                   |
| Option B: | cannot be greater than $90^\circ$                                    |
| Option C: | cannot be greater than $180^\circ$                                   |
| Option D: | cannot be greater than $160^\circ$                                   |
|           |  |
| Q23.      | In the principle of phase control.....                               |
| Option A: | the load is on for some cycles and off for some cycles               |
| Option B: | control is achieved by adjusting the firing angle of the devices     |

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| Option C: | control is achieved by adjusting the number of on off cycles           |
| Option D: | control cannot be achieved   |
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| Q24.      | The single phase bridge type cycloconverter uses _____ number of SCRs. |
| Option A: | 4  |
| Option B: | 8  |
| Option C: | 6  |
| Option D: | 2  |
|           |  |
| Q25.      | Which device can be used in a chopper circuit?                         |
| Option A: | BJT  |
| Option B: | MOSFET   |
| Option C: | GTO  |
| Option D: | SCR  |