CLASS: BE   SEMESTER : V
BRANCH: EEE   SESSION : MO/19

SUBJECT: EE5205 POWER ELECTRONICS

TIME: 3 HOURS   FULL MARKS: 60

INSTRUCTIONS:
1. **The question paper contains 7 questions each of 12 marks and total 84 marks.**
2. **Candidates may attempt any 5 questions maximum of 60 marks.**
3. **The missing data, if any, may be assumed suitably.**
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. **Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**

Q.1(a)	How dv/dt protection of an SCR is done?	[2]
Q.1(b)	When SCR is fired gate looses its Control. Why?	[4]
Q.1(c)	Elucidate with suitable figure: Latching Current, V_{DWM}, V_{RRM}, Virtual Short, Rise Time, String Efficiency and Dead Time.	[6]

Q.2(a)	Give applications of Power Electronics in attributing green energy.	[2]
Q.2(b)	Why IGBT is popular among power switches?	[4]
Q.2(c)	Draw a neat block diagram of Industrial firing circuit. In order to highlight its application, draw its its waveform from stating to end.	[6]

Q.3(a)	Explain: THD and Ripple Factor.	[2]
Q.3(b)	Analyse freewheeling action of a power diode with power circuit and suitable voltage & current waveform.	[4]
Q.3(c)	When a single phase bridge rectifier can be used in regerative braking mode? Give its analysis using power circuit, load voltage and load current. Develop expression average value of load voltage.	[6]

Q.4(a)	A Three phase full bridge rectifier is connected to to a the separately excited and unsatirated dc shunt motor. The converter is fed from 400V, 50 Hz three phase balanced supply. The phase sequence is ABC. The motor runs at 1400rpm when firing angle α=60^0 is and has Ra= 1ohm and R_f =400ohms. Draw Block diagram and Power circuit.	[2]
Q.4(b)	Draw load voltage with respect to input voltage.	[4]
Q.4(c)	Draw load current of phase A. Estimate the average value of load voltage at firing angle α=60^0.	[6]

Q.5(a)	What is role of feedback diode in Power Electronics?	[2]
Q.5(b)	In order to describe working of three phase VSI in 180degree mode. Draw power circuit using power MOSFET. Show sequence of conduction of each SCR in Phase ABC.	[4]
Q.5(c)	Draw load voltage Van, Vbn and Vab.	[6]

Q.6(a)	What is the problem in operation of SCR and how it is arrested?	[2]
Q.6(b)	Which DC-DC converter can be used in regerative mode? Explain its principle of operation with power circuit, load voltage, load current wrt supply voltage.	[4]
Q.6(c)	In order to design a power electronics converter in Power Electronics Lab give its power circuit and firing scheme and suitable voltage as well as current waveforms. Also explain working of converter.	[6]

Q.7(a)	Give a circuit in order to control speed of a ceiling fan.	[2]
Q.7(b)	Describe performance of Integral cycle control with circuit and suitable waveforms	[4]
Q.7(c)	Execute performance evaluation of single phase to single phase cycloconverter step-down cycloconverter with circuit and appropriate waveform.	[6]

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