USN :	1	D	S	1		E	C			

Dayananda Sagar College of Engineering

Shavige Malleshwara Hills, Kumaraswamy Layout, Banashankari, Bangalore-560078, Karnataka
Tel : +91 80 26662226 26661104 Extn : 2731 Fax : +90 80 2666 0789
Web - http://www.dayanandasagar.edu Email : hod-ece@dayanandasagar.edu
(An Autonomous Institute Affiliated to VTU, Approved by AICTE & ISO 9001:2008 Certified)
(Accredited by National Assessment & Accreditation Council (NAAC) with 'A' grade)

Department of Electronics & Communication Engg.

Continuous Internal Evaluation – II

Course Name : **POWER ELECTRONICS & APPLICATIONS**	Date :	10/07/2021
Course Code : 18EC6DECPE	Day :	Saturday
Semester : 6	Timings :	11:15 A.M – 12:45 P.M
Max Marks : 50 M	Duration :	1½ Hrs.

No.		Question Description	Mks	CO & Levels
Q1	(a)	Assertion (A): Single phase half-wave converter introduces a dc component into the supply line. Reason (R) : The supply current taken from the source is unidirectional and is in the form of dc pulses (i) Both A and R are true and R is the correct explanation of A, (ii)Both A and R are true but R is not the correct explanation of A, (iii)A is true but R is false, (iv) A is false but R is true.	1	
	(b)	A single-phase full converter is connected across 230 V ac. Its average output voltage when firing angle is 30° is approximately equal to (i) 230 V (ii) 193 V (iii)89.5 V (iv) 179 V	1	
	(c)	A chopper uses high speed to _____ from a source load. (i) connect (ii) disconnect (iii) terminate (iv) connect and disconnect	1	
	(d)	In which chopper average voltage output (Vo) in a step up chopper is greater than the voltage input (Vs)? (i) Step Down Chopper (ii) Step Up chopper (iii) Step Up/Down Chopper (iv) All of the above	1	
	(e)	A single phase voltage controller has input of 230 V and a load of 15 Ω resistive. For 6 cycles on and 4 cycles off, determine the power delivered to the load. (i) 2.1W (ii) 2.1kW (iii)516 W (iv) 5.16kW	1	
	(f)	In the principle of phase control (i) the load is on for some cycles and off for some cycles (ii) control is achieved by adjusting the firing angle of the devices (iii) control is achieved by adjusting the number of on off cycles (iv) control cannot be achieved	1	
	(g)	If k is the duty cycles of the controller, then the rms value of the output voltage in case of a integral cycle control circuit will be? Consider the input to be sinusoidal with peak value Vm and rms value Vs. (i) V_s X K	1	

		(ii) V_s/K (iii) V_s X $K^{1/2}$ (iv) V_s		
	(h)	Pulse gating is suitable for (i) R loads only (ii)R and RL loads (iii)RL loads only (iv)All types of loads	1	
	(i)	In AC voltage controllers the (i)variable dc with fixed frequency is obtained (ii)variable ac with variable frequency is obtained (iii)variable ac with fixed frequency is obtained (iv)variable dc with fixed frequency is obtained	1	
	(j)	Choppers converter (i)AC to DC (ii) DC to AC (iii) DC to DC (iv) AC to AC	1	
Q2	a	Enlist the gating sequence for the phase controlled converter & Single Phase Full converter with RL Load.	4	CO3, L2
	b	Find the performance of a single phase purely resistive load Thyristor converter with delay angle $\alpha = \frac{\pi}{2}$, determine (a) the rectification efficiency, (b) the form factor, (c) Ripple Factor (d) TUF (e) PIV	6	CO3, L4
Q3		A step down chopper has a resistive load of R = 15 ohm and input voltage E_{dc} = 200V. When the chopper remains ON, its voltage drop is 2.5 V. The chopper frequency is 1Khz. If te duty cycle is 50%, determine : (a) Average output voltage (b) RMS output voltage (c) Chopper efficiency (d) Efficient input resistence of chopper	10	CO3, L3
Q4		Discover the performance parameters of a single phase Full – wave ac controller with Resistive loads of R = 10Ω & the input voltage is V_s = 120V (rms), 60 Hz. The delay angles of thyristors T_1 & T_2 are equal : $\alpha_1 = \alpha_2 = \frac{\pi}{2}$. Determine (a) the RMS output voltage V_o, (b) the input PF, (c) The average current of the thyristors I_A, and (d) The RMS current of the thyristors I_R.	10	CO4, L4
		OR		
Q5		Observe the performance of a single phase Full wave Controller with an RL load, with input RMS voltage is V_S = 120V, 60Hz. The load is such that L = 6.5mH and R = 2.5Ω. The delay angles of the thyristors are equal : $\alpha_1 = \alpha_2 = \frac{\pi}{2}$. Determine (a) the conduction angle of the thyristor T_1, δ; (b) The RMS output voltage V_o, (c) The RMS thyristor current I_R; (d) The RMS output current I_o; (e) The average current of a Thyristor I_A; & (f) the input PF.	10	CO4, L4
Q6		Explain the basic Chopper classifications with neat diagrams & list the various applications of the same.	10	CO3, L2
		OR		
Q7		Reveal the principle of ON – OFF control & hence elaborate the operation of Single phase full – wave controller with RL load.	10	CO4, L4