MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B. TECH (ELECTRONICS AND INSTRUMENTATION)
PROCTORED ONLINE MAKE-UP EXAMINATION - Feb/March. 2022
SUBJECT: Power Electronics (ICE 4067)

TIME: 2.20-3:35 PM **DATE: 19/02/2022** **MAX MARKS 20**

Note: Answer All questions.

1	A	Describe the effect of source inductance on the performance of converters. A 3-phase M-3 converter is operated from a 3-phase, 230 volts, 50 hz supply with load resistance of 25 Ω. An average output voltage of 60% of the maximum possible voltage is expected. Determine the firing angle and the rms value of output load current.	4M
	B	Describe the working of dual converter in presence of circulating current.	2M
	C	With neat circuit and waveforms, explain the working of single-phase half-wave and full-wave AC voltage converters.	4M
2	A	With the help of circuit diagram and waveforms, describe the working of single-phase parallel inverter.	4M
	B	Describe the principle of operation of step-up chopper and derive the equation for average value of output voltage. A step-up chopper has input voltage of 180 volts and output voltage of 450 volts. If the non-conducting time of thyristor chopper is 45 μs, compute the pulse width of output voltage. In case the output-voltage pulse width is made 2.5 times of the initial pulse width for constant frequency operation, find average value of new output voltage.	4M
	C	A 230 V 50hz single-phase full converter feeds power to RLE load with R = 6 Ω, L=60 mH and E=75V. In case one of the four SCRs gets open circuited due to a fault, compute the value of average value of voltage and current under the assumption that the load is continuous. The firing angle of the working SCRs is 50°.	2M