BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.TECH/PRE-PHD **SEMESTER : 2nd**
BRANCH: EEE **SESSION : SP/2023**

SUBJECT: EE543 SWITCHED MODE POWER CONVERSION

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
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.

			CO	BL
Q.1(a)	Describe the basic working principle of switched mode power supply with help of an appropriate example.	[5]	1	1
Q.1(b)	Describe how energy is stored in the electric field between the parallel plates of capacitor.	[5]	1	1
Q.2(a)	Classify different types of power converter.	[5]	2	2
Q.2(b)	Compare the voltage gain of an ideal DC-DC converter and voltage gain of practical DC-DC converter.	[5]	2	2
Q.3(a)	With the help of circuit diagram elucidate the operating principle of forward converter along with the theoretical waveforms.	[5]	3	3
Q.3(b)	Sketch the voltage and current waveforms in order to explain operating principle of a Push-Pull converter with equivalent circuit diagram.	[5]	3	3
Q.4(a)	Develop a small signal model of the boost converter.	[5]	4	4
Q.4(b)	Develop large signal model of buck-boost converter.	[5]	4	4
Q.5(a)	Develop an equation for ZCS converter resonant inductor current and voltage across capacitor in the mode 2 and mode 3 of the converter.	[5]	5	5,6
Q.5(b)	Design basic series resonant inverter operation along with waveforms for 1kHz switching frequency? Load power is 1kVA.	[5]	5	5,6

::::::24/04/2023::::::E