Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

## FIFTH SEMESTER BTECH. (E & C) DEGREE END SEMESTER EXAMINATION DECEMBER 2020/JANUARY 2021 SUBJECT: ELECTRONIC PRODUCT DESIGN AND PACKAGING (ECE - 4303)

## TIME: 3 HOURS

## MAX. MARKS: 50

- Instructions to candidates
  - Answer ALL questions.Missing data may be suitably assumed.
- 1A. Discuss the national policy for electronics product manufacturing with flow chart. Give its objectives with the components of the product planning.
- 1B. Explain reverse engineering and redesign methodology with necessary flow chart.
- 1C. Draw the circuit diagram for regulated power supply operating on 230V, 50HZ AC signal giving an output voltage of  $\pm 12V$  and output current of 1A.The supply voltage variation can be taken as  $\pm 15\%$ .The load regulation should be more than 0.5% and the output ripple is less than 0.2%. Calculate the peak value of the secondary voltage and turns ratio of the transformer.

(4+3+3)

- 2A. Discuss the need of heat sink in Electronic circuits. Explain The construction of any one type of heat sink with neat diagram and give its features.
- 2B. Discuss Miller indices with its different plane with illustration.
- 2C. A Transistor with Vce=20V and Ic= 1A has a 1°C/W junction to a case thermal resistance. If the value of  $\theta_{cs} = 0.4$ °C. Calculate the thermal resistance for the heat sink that will keep the maximum junction temperature at 90°C when the ambient temperature is 25°C.

(4+3+3)

- 3A. Discuss various types of common IC packages. Explain wafer bumping technology and give its advantages.
- 3B. Discuss PCB manufacturing technics with flow chart. Explain the need of plating in Printed Circuit Boards.
- 3C. In a multilayer PCB signal and ground plane is separated by 0.15 inch, common area of two planes is 5.25 inch<sup>2</sup>. Find the parasitic capacitance for relative permittivity of substrate with  $\epsilon_r = 2.5$ .

(4+3+3)

- 4A. Discuss various types of noises in the Electronic circuits. Draw the block diagram of the low noise amplifier and Explain its function.
- 4B. Discuss the reliability issues in the integrated circuits with its consequences.
- 4C. Discuss the cooling choices with its transfer curve in the Electronic circuits

(4+3+3)

- 5A. What are the various types of electromagnetic interference in the electronic circuits? Give its effects and explain how to neutralize them.
- 5B. With neat diagram explain the cross talk effects in the electronic circuits. Give the remedies to minimize the cross talks.
- 5C. Explain the working of switched mode power supply with its block diagram and input output wave forms.

(4+3+3)