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Question Paper Code: 45503

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Fifth Semester

Electronics and Instrumentation Engineering

14UEI503 - INDUSTRIAL ELECTRONICS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- For very high and ultra high frequency applications which of the following is preferred
(a) SIT (b) IGBT (c) MOSFET (d) BJT
- Power MOSFET is a
(a) Voltage controlled device (b) Current controlled device
(c) Frequency controlled device (d) None of the above
- The converter that can operate in both 3 phase and 6 phase is
(a) 6 phase full converter (b) 6 phase semi converter
(c) 3 phase full converter (d) 3 phase semi converter
- Maximum power is transferred when load impedance is
(a) equal to zero
(b) equal to source resistance
(c) equal to half of the source resistance
(d) none of the above
- A single phase full bridge inverter can be operated in load commutation mode in case load consist of
(a) RL (b) RLC underdamped
(c) RLC over damped (d) RLC critically damped

6. Dot conversion in coupled circuits is used
- (a) to determine the polarity of the self induced voltage in coils
 - (b) to determine the polarity of the mutually induced voltage in coils
 - (c) to measure the mutual inductance
 - (d) to measure the mutual inductance
7. The time constant of a series RC circuit is
- (a) R/C
 - (b) e^{-RC}
 - (c) $1/RC$
 - (d) RC
8. Inductor does not allow sudden changes
- (a) in voltages
 - (b) in currents
 - (c) in both (a) & (b)
 - (d) none of the above
9. Which of the following is used in heat sink
- (a) iron
 - (b) aluminium
 - (c) silver
 - (d) carbon
10. An SMPS circuit operating at 20 kHz to 100 kHz range uses which of the following elements
- (a) Thyristor
 - (b) TRIAC
 - (c) UJT
 - (d) MOSFET

PART - B (5 x 2 = 10 Marks)

11. Define turn-off time of SCR.
12. What is a cyclo converter?
13. What is meant by Class E Chopper?
14. Give the definition of Slip power.
15. Mention the different topologies of UPS.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss the transfer, output and switching characteristics of power MOSFET. (16)
- Or
- (b) Draw and explain the cross sectional view of IGBT and also explain its output and transfer characteristics. (16)
17. (a) With neat sketch, explain the working principle of cyclo converters. (16)
- (b) With neat circuit diagram and waveforms, explain the working of single phase dual converter. (16)

18. (a) Draw and explain the circuit diagram of series and parallel inverter. Describe its working principle. (16)

Or

(b) (i) Explain using a diagram the operation of a series inverter and bring out its limitations. (10)

(ii) Develop the circuit of a modified series inverter. (6)

19. (a) Explain the operation of chopper based four quadrant separately excited D.C motor drive. (16)

Or

(b) Explain both types of static Scherbius drive for operating speeds below as well as above synchronous speed with relevant circuit diagram. (16)

20. (a) Explain in details about induction heating and dielectric heating with neat sketch. (16)

Or

(b) With neat sketch, explain the working of switched mode power supply. (16)
