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Question Paper Code: 41553

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

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)

- The device that does not have the gate terminal is
 - Triac
 - FET
 - SCR
 - Diac
- Power MOSFET is a
 - Voltage controlled device
 - Current controlled device
 - Frequency controlled device
 - None of the above
- The converter that can operate in both 3 phase and 6 phase is
 - 6 phase full converter
 - 6 phase semi converter
 - 3 phase full converter
 - 3 phase semi converter
- Maximum power is transferred when load impedance is
 - equal to zero
 - equal to source resistance
 - equal to half of the source resistance
 - none of the above
- A single phase full bridge inverter can be operated in load commutation mode in case load consist of
 - RL
 - RLC underdamped
 - RLC over damped
 - 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. Wattmeter deflection in ac circuit is proportional to
- (a) average power in the circuit
 - (b) maximum power in the circuit
 - (c) instantaneous power in the circuit
 - (d) mean power in the circuit

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. List the merits of induction heating.

PART - C (5 x 16 = 80 Marks)

16. (a) With necessary diagrams, explain the steady state characteristics 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)

Or

(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) Explain the working of online and offline UPS. (16)
