University of Mumbai

Examination 2021 under cluster __ (Lead College: _____)

Examinations Commencing from June 2021

Program: **_Instrumentation Engineering**

Curriculum Scheme: Rev 2016

Examination: TE Semester VI

Course Code: ISC 603 Course Name: Electrical Machines and Drives

Time: 2 hour Max. Marks: 80

Q.1 Attempt all the questions.(40 Marks)

Q1.	The forward break over voltage is the
Option A:	anode-cathode voltage at which conduction starts with gate signal applied
Option B:	anode-cathode voltage at which conduction starts with no gate signal applied
Option C:	gate voltage at which conduction starts with no anode-cathode voltage
Option D:	gate voltage at which conduction starts with anode-cathode voltage applied
Q2.	The TRIAC's terminals are
Option A:	gate, anode, cathode
Option B:	MT1, MT2, gate
Option C:	gate1, gate2, anode, cathode
Option D:	MT1, MT2, gate1, gate2
Q3.	To avoid commutation failure
Option A:	circuit turn-off time must be greater than the thyristor turn-off time
Option B:	circuit turn-off time must be lesser than the thyristor turn-off time
Option C:	circuit turn-off time must be equal to the thyristor turn-off time
Option D:	thyristor turn-off time is must be equal to turn on time
Q4.	DC shunt motor is used to drive fans because they require
Option A:	they require huge torque in the beginning
Option B:	it requires huge speed
Option C:	it requires low torque
Option D:	it requires constant torque
Q5.	The voltage blocking capability of the IGBT is determined by the
Option A:	injection layer
Option B:	body layer

Option C:	Metal used for contacts
Option D:	drift layer
Q6.	dv/dt protection is provided to the SCR by
Option A:	connecting a capacitor in parallel with the load
Option B:	connecting an inductor in series with the load
Option C:	connecting a capacitor & resister in parallel with the device
Option D:	connecting an inductor & resister in parallel with the device
Q7	Choose the false statement.
Option A:	SCR is a bidirectional device
Option B:	SCR is a controlled device
Option C:	In SCR the gate is the controlling terminal
Option D:	SCR are used for high-power applications
Q8.	In inverters, to make the supply voltage constant
Option A:	an inductor is placed in series with the load
Option B:	capacitor is connected in parallel to the load side
Option C:	capacitor is connected in parallel to the supply side
Option D:	an inductor is placed in series with the load
Q9.	A single phase half bridge inverter has load R = 2 Ω and a dc voltage source Vs/2 = 115 V. Find the rms value of the fundamental load current. 1
Option A:	10.25 A
Option B:	51.7 A
Option C:	86 A
Option D:	24.8 A
Q10.	The output voltage from a single phase full wave bridge inverter varies from
Option A:	Vs to -Vs
Option B:	Vs to zero
Option C:	Vs/2 to zero
Option D:	-Vs/2 to Vs/2
Q11.	A single-phase asymmetrical semi-converter employs
Option A:	one SCR and one diode in each leg
Option B:	two SCRs in one leg and two diodes in the other

Option C:	two SCRs in both the legs
Option D:	two diodes in both the legs
Q12.	By using a freewheeling diode (FD) in a rectifier with RL load, the power consumed by the load
Option A:	increases
Option B:	decreases
Option C:	is not affected
Option D:	decreases to zero
Q13.	A capacitor start ,capacitor run single phase induction motor is basically a
Option A:	DC shunt motor
Option B:	DC series motor
Option C:	2 phase induction motor
Option D:	3 phase induction motor
Q14.	In induction motor, greater the number of poles
Option A:	Lesser the speed
Option B:	Greater the speed
Option C:	Lesser the frequency
Option D:	No relation
Q15	The speed of a BLDC motor can be controlled by _____
Option A:	Changing input DC voltage
Option B:	Changing temperature
Option C:	Changing wind direction
Option D:	Cannot be controlled
Q16.	Which of the following motor is best suited for position control application
Option A:	Shaded Pole IM
Option B:	1-phase IM
Option C:	DC motor
Option D:	Servomotor
Q17	In sinusoidal pulse width modulation, the comparator output is high when the
Option A:	triangular wave has magnitude higher than the sinusoidal wave
Option B:	sinusoidal wave has magnitude higher than the triangular wave
Option C:	triangular wave has magnitude equal to the sinusoidal wave
Option D:	square wave has magnitude higher than the sinusoidal wave
Q18	In current source inverters (CSIs), the output voltage's

Option A:	amplitude depends upon the load impedance
Option B:	waveform depends upon the load impedance
Option C:	amplitude as well as the nature of the waveform depends on the load
Option D:	both amplitude and waveform are independent of the load impedance
Q19	A single phase half bridge inverter has load R = 2 Ω and a dc voltage source Vs/2 = 115 V. Find the rms value of the fundamental load current.
Option A:	10.25 A
Option B:	51.7 A
Option C:	86 A
Option D:	24.8 A
Q20	No load speed of which of the following motor is highest.
Option A:	DC Shunt Motor
Option B:	DC Series Motor
Option C:	Compound Motor
Option D:	Single phase Motor

Q2 **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain the different types of dc motors Compare their characteristics
B	Explain the working of PWM inverter.
C	Write a short note shaded pole IM

Q3 **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain any two speed control methods of DC shunt and DC series motor. each.
B	Explain fully controlled full bridge rectifier with RL load. Also draw the necessary waveforms.
C	Explain Working of 3-phase IM . Also explain its speed- torque characteristic of 3-phase IM