K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
I SESSIONAL TEST QUESTION PAPER 2018 – 19 ODD SEMESTER
SET-B

USN										

Degree : **B.E**
Branch : **ECE**
Course Title : **Power Electronics**
Duration : **90 Minutes**

Semester : **VII 'A'&'B'**
Date : **4-9-2019**
Course Code : **15EC73**
Max Marks : **30**

Note: Answer ONE full question from each part

Q. No.	Question	Marks	K Level	CO mapping
	PART-A			
1 (a)	Define power electronics. **Identify** its industrial applications.	5	K2 Understand	CO1
(b)	**Identify** the merits and demerits of power electronics as compared to conventional methods of power processing.	5	K2 Understand	CO1
(c)	**Explain** class B commutation.	5	K2 Understand	CO2
	OR			
2 (a)	**Explain** Two Transistor Analogy of SCR. Using Two Transistor analogy derive an expression for anode current in terms of gate current.	5	K2 Understand	CO1
(b)	**Explain** the static characteristics of SCR.	5	K2 Understand	CO1
(c)	**Discuss** the different methods to turn ON Thyristor.	5	K2 Understand	CO2
	PART-B			
3 (a)	With neat diagram, **discuss** the control characteristics of various power semiconductor devices.	5	K2 Understand	CO1
(b)	**Discuss** the Gate Characteristics of SCR with neat diagram.	5	K2 Understand	CO1
(c)	**Explain** Dynamic Turn OFF characteristics of SCR.	5	K2 Understand	CO2
	OR			
4 (a)	**Explain** the peripheral effects caused by power electronics converters.	5	K2 Understand	CO1
(b)	**Identify** the components of total average power loss occurring in practical semiconductors switches? **Discuss** the need to compute these losses?	5	K2 Understand	CO1
(c)	A thyristor with latching current of 100mA is connected in series with a resistance of 10 ohms and inductance of 1 H. DC source voltage is 207 volt. **Compute** the minimum gate pulse width to turn on thyristor.	5	K2 Understand	CO2

Course In charge **Head - Dept** **Principal**

5-9-19

K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109
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II SESSIONAL TEST QUESTION PAPER 2019 – 20 ODD SEMESTER
SET-A

USN										

Degree	:	B.E	Semester	:	VII 'A'&'B'
Branch	:	ECE	Date	:	15-10-2019
Course Title	:	Power Electronics	Course Code	:	15EC73
Duration	:	90 Minutes	Max Marks	:	30

Note: Answer ONE full question from each part

Q. No.	Question	Marks	K Level	CO mapping
	PART-A			
1(a)	Draw the circuit diagram of RC Triggering circuit and **illustrate** its working with relevant waveforms.	5	Applying (K3)	CO2
(b)	With a neat circuit diagram and waveform, **explain** the working of sinlge phase dual converter.	5	Understanding (K2)	CO3
(c)	Explain the working of single phase half wave controller with R load. Also **derive** the expression for RMS output voltage.	5	Applying (K3)	CO3
	OR			
2(a)	Draw the circuit diagram of UJT Triggering circuit and **illustrate** its working with relevant waveforms.	5	Applying (K3)	CO2
(b)	**Explain** the working of semi converter (Half Bridge) with RL Load along with relevant circuit diagrams and waveforms.	5	Understanding (K2)	CO3
(c)	Explain the working of ON-OFF type AC voltage controller. **Derive** the expression for RMS output voltage.	5	Applying (K3)	CO3
	PART-B			
3(a)	A UJT is used to trigger the thyristor whose minimum gate triggering voltage is 6.2 V. The UJT ratings are $\eta = 0.66$, $I_P = 0.5$ mA, $I_V = 3$ mA, $R_{B1} + R_{B2} = 5$ KΩ, leakage current = 3.2 mA, $V_P = 14$ V, $V_V = 1$ V. Oscillator frequency is 2 KHz and the capacitor C = 0.04 μF. **Design** the circuit.	5	Applying (K3)	CO2
(b)	Explain the operation of single phase bidirectional AC voltage controller for resistive load with the help of neat circuit diagram and **derive** expression for rms output voltage.	5	Applying (K3)	CO3
(c)	An AC voltage controller has a resistive load of R = 10Ω and rms input voltage is 120 V, 50 Hz. The thyristor switch is ON for n = 25 cycles and OFF for M = 75 cycles. **Calculate**: rms output voltage, input power factor, average and rms thyristor current.	5	Applying (K3)	CO3
	OR			

4(a)	Explain the working of half wave converter with RL load. Also **derive** the expression for average output voltage.	5	Applying (K3)	CO2
(b)	A single phase half wave ac voltage controller has an input voltage of 120 V and a load resistance of 5Ω. The firing angle of thyristor is 60^0. **Calculate** average output voltage, rms output voltage, power factor.	5	Applying (K3)	CO3
(c)	With the help of circuit diagram, explain the operation of a single phase full converter with RL load. **Derive** expression for rms and average output voltages.	5	Applying (K3)	CO3

Course In charge

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
III SESSIONAL TEST QUESTION PAPER 2019 – 20 ODD SEMESTER
SET-A

USN										

Degree	:	**B.E**	**Semester**	:	**VII 'A'&'B'**
Branch	:	**ECE**	**Date**	:	**25-11-2019**
Course Title	:	**Power Electronics**	**Course Code**	:	**15EC73**
Duration	:	**90 Minutes**	**Max Marks**	:	**30**

Note: Answer ONE full question from each part

Q. No.	Question	Marks	K Level	CO mapping
	PART-A			
1(a)	**Explain** the operation of step-down chopper with R load. Also **derive** the expression for average and rms output voltage.	5	Applying (K3)	CO4
(b)	With a neat sketch and waveforms, **explain** the working of buck regulator.	5	Understanding (K2)	CO4
(c)	**Illustrate** the working of half bridge inverter with R load.	5	Applying (K3)	CO5
	OR			
2(a)	For the step down chopper with source voltage of 230 V, load resistance of 10 Ω with a voltage drop across chopper of 2 V. Duty cycle is 0.4. **Calculate** i) average and rms output voltage ii) Chopper efficiency.	5	Applying (K3)	CO4
(b)	**Explain** the performance parameters of Inverters.	5	Understanding (K2)	CO4
(c)	**Illustrate** the working of full bridge inverter with RL load.	5	Applying (K3)	CO5
	PART-B			
3(a)	**Illustrate** the working principle of step up chopper.	5	Applying (K3)	CO4
(b)	A step up DC chopper has an input voltage of 200 V and an output voltage of 250 V. The blocking period in each cycle of operation is 0.6 µsec. **Calculate** the period of conduction in each cycle.	5	Applying (K3)	CO4
(c)	The single phase half bridge inverter has the DC input of 48 V. The load resistance is 4.8 Ω. **Determine** the i) rms value of output voltage ii) RMS value of fundamental component iii) Total harmonic distortion	5	Applying (K3)	CO5
	OR			
4(a)	**Illustrate** the working of class E chopper.	5	Applying (K3)	CO4
(b)	**Illustrate** the working of boost regulator.	5	Applying (K3)	CO4
(c)	With a neat sketch, **illustrate** the working of single phase thyristorized current source inverter.	5	Applying (K3)	CO5

(5)

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20/11/19

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