

School: SOE	Level: BE	Invigilator's Sign:
Program: BEEE	Year/Part: III/II	Superintendent's Sign:
Subject: POWER ELECTRONICS(EG661EE)		Code No.

- i. Answers should be given by filling the Multiple-Choice Questions' Answer Sheet.
ii. The main answer sheet can be used for rough work.

Code No.

GROUP A (Multiple-Choice Questions)	[10x1=10]	Time: 20 Minutes
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- The natural commutation process does not work on:
 - Triangular wave
 - square wave
 - sinusoidal wave
 - constant dc voltage
- Which of the following does not have controlled turn on and turn off characteristics?
 - GTO Thyristor
 - MOSFET
 - BJT
 - Diode
- The average output voltage of a half wave rectifier with resistive load is:
 - $\frac{V_m}{2}$
 - $\frac{V_m}{2\pi}$
 - $\frac{V_m}{\pi}$
 - $2V_m$
- Which of the following has highest theoretical efficiency?
 - Rectifier
 - Chopper
 - Inverter
 - AC Regulator
- Which of the following type of Chopper can work both as step up and step down chopper?
 - Type A Chopper
 - Type B Chopper
 - Type C Chopper
 - None of the above
- The peak value of fundamental voltage of single phase half bridge inverter is:
 - $\frac{2V_s}{\pi}$
 - $\frac{V_s}{\pi}$
 - $\frac{V_s}{2\pi}$
 - $\frac{V_s}{2}$
- If Anode to Cathode voltage of an SCR thyristor is positive, then
 - J1 and J2 are forward biased
 - J2 and J3 are forward biased
 - J1 and J3 are forward biased
 - J1 and J3 are reverse biased
- The output of a single phase half bridge inverter on R load is ideally:
 - a sine wave
 - a square wave
 - a triangular wave
 - constant dc
- A voltage regulator keeps a constant output voltage when the input or load varies within limits.
 - DC
 - AC
 - ripple
 - none
- A Cycloconverter is a
 - One stage power converter
 - one stage voltage converter
 - One stage frequency Converter
 - none of the above

Multiple Choice Questions' Answer Sheet

Marks Secured: _____

In Words: _____

Examiner's Sign: _____ Date: _____

Scrutinizer's Marks: _____

In Words: _____

Scrutinizer's Sign: _____ Date: _____

Corrected Fill			
(A)	(B)	(C)	(D)
Incorrected Fill			
(X)	(B)	(C)	(D)

1. (A) (B) (C) (D)	6. (A) (B) (C) (D)
2. (A) (B) (C) (D)	7. (A) (B) (C) (D)
3. (A) (B) (C) (D)	8. (A) (B) (C) (D)
4. (A) (B) (C) (D)	9. (A) (B) (C) (D)
5. (A) (B) (C) (D)	10. (A) (B) (C) (D)

Manmohan Technical University
Office of the Controller of Examinations
Exam Year: 2082, Jestha (Model Question)

School: SOE	Level: BE	Time: 3 Hours
Program: BEEE	Year/Part: III/II	Full Marks: 50
Subject: : POWER ELECTRONICS (EG661EE)		Full Marks: 20

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

GROUP A (Multiple-Choice Questions in separate paper)

[10×1=10]

GROUP B (Short Answer Questions - Attempt Any Eight Question)

[8×2=16]

1. Explain in brief about the working principle of Power BJT.
2. Write notes about the commutation process of Thyristor.
3. Derive the expression for the Efficiency of a half wave rectifier with resistive load.
4. How does a Step Up Chopper Work?
5. Derive the expression for fundamental component of output voltage of a single phase bridge inverter.
6. Explain the working principle of an AC Voltage Regulating circuit.
7. What are the ripple components and harmonics? Why are they present in power electronic circuits?
8. What do you mean by PWM inverter? List out its applications.
9. What are the processes that can be employed to control the speed of DC motors?

GROUP C (Long Answer Questions – Attempt Any Six Questions)

[6×4=24]

10. Describe the switching operation and steady state V-I characteristics of IGBT.
11. Explain in brief about the methods of turning ON of a Silicon Controlled Rectifier.
12. A single phase full wave rectifier feeds power to RLE load with $R=6$ ohms, $L = 6$ mH and $E = 60$ V. The ac source voltage is 230 V, 50 Hz. For continuous conduction, find the average value of load current for a firing angle delay of 50 degree.
13. Find the expression for V_{dc} , I_{dc} , V_{rms} and I_{rms} for a three phase full wave inverter with RL load.
14. For a Type A chopper, dc source voltage = 230 V, load resistance = 10 ohm. Take a voltage drop of 5V across chopper while it is on. For a duty cycle of 0.3, calculate
 - a) Average and rms values of output voltage
 - b) Chopper efficiency
15. A single phase voltage controller feeds power to a resistive load of 3 ohm from 230 V, 50 Hz source. Calculate the maximum values of average and rms thyristor currents for any firing angle α . Also find the ratio of third harmonic voltage to fundamental voltage for $\alpha = \pi/3$.
16. Draw and explain about the performance of a three phase to single phase cycloconverter.

THE END