



College of Engineering, Science and Technology  
School of Electrical and Electronics Engineering

**Bachelor of Engineering**  
**(Electronics and Instrumentation)**  
**BENG – Year 3**

**EEE723 – Industrial Electronics**

Semester 1, 2016

Date: 15<sup>th</sup> June 2016      Time: 9:00AM to 12:10PM  
Duration – 3 h 10 min (Including 10 min reading time)

Total Marks – 100

Instructions to candidates:

- 1) You are allowed 10 minutes extra reading time during which you are NOT allowed to write.
- 2) Begin each answer on a fresh page and use both sides of the sheet.
- 3) Write your candidate number at the top of each attached sheet.
- 4) Insert all written full-scapes, graph paper, drawing paper etc. in their correct sequence and secure with string.
- 5) For all sheets of paper on which rough/ draft work has been done, cross it through and you must attach all of them to your answer scripts.
- 6) Write clearly the number(s) of the questions(s) attempted on the top of each sheet.
- 7) Start your answer for a new question on new page.
- 8) Use of mobile phones or other programmable electronic gadget/storage device is NOT ALLOWED

- *Total Number of pages – 02 (Two) including this cover page*

## Attempt ANY FIVE from the following SIX Questions.

### Question 1:

[Total 20 Marks]

- A) Explain the working of a Single-Phase H-Bridge Inverter with suitable circuit diagram and switching waveforms. [15 Marks]
- B) Write a short note on LM317 Adjustable voltage regulator and state mathematical equation for controlling the output voltage. [5 Marks]

### Question 2:

[Total 20 Marks]

- A) Explain the working of a Three-Phase H-Bridge Inverter with suitable circuit diagram and switching waveforms. [10 Marks]
- B) Explain the concept of PWM modulation used in voltage control of inverters [10 Marks]

### Question 3:

[Total 20 Marks]

- A) With a suitable block diagram explain working of a Switched Mode Power Supply. [10 Marks]
- B) With suitable semiconductor diagram and symbol, explain the working and characteristics of Silicon Controlled Rectifier (SCR) or Thyristor. [10 Marks]

### Question 4:

[Total 20 Marks]

- A) With a suitable circuit diagram and switching waveforms, explain the working of a full-wave controlled bridge rectifier using SCRs. [10 Marks]
- B) With the help of suitable semiconductor diagram, explain the characteristics curves and various regions on it for a power Bipolar Junction Transistor (BJT). [10 Marks]

### Question 5:

[Total 20 Marks]

- A) For a 1-phase full-wave diode rectifier, explain its working with suitable circuit diagram and waveforms and also state the mathematical equations for its voltage, current, rectifier efficiency, ripple factor etc. [15 Marks]
- B) Write a short note on Insulated-Gate-Bipolar-Transistor (IGBT) [5 Marks]

### Question 6:

[Total 20 Marks]

- A) Explain a scheme for the speed control of a DC motor using PWM technique. [10 Marks]
- B) Describe the operation of a Cycloconverter with proper circuit diagram and switching waveforms for single-phase operation. [10 Marks]

\*\*\*\*\* End of Question Paper \*\*\*\*\*