



SE-8291

**B. E. - III (Sem. V) (Instrumentation & Control)
Examination**

May / June - 2011

Electronics in Industries

Time : 3 Hours]

[Total Marks : 100

Instructions : (1)

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| नीचे दशांशवले निशानीवाणी विगतो उत्तरवही पर अवश्य लपवी. Fillup strictly the details of signs on your answer book. | Seat No. : |
| Name of the Examination : | <input type="text"/> |
| B. E. - 3 (SEM. 5) (INSTRUMENTATION & CONTROL) | <input type="text"/> |
| Name of the Subject : | <input type="text"/> |
| Electronics in Industries | <input type="text"/> |
| Subject Code No. : <input type="text" value="8"/> <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="1"/> | Section No. (1, 2,.....) : <input type="text" value="NIL"/> |
| Student's Signature | |

- (1) Attempt all Questions.
- (2) Figure to the right indicates marks.
- (3) Answer of two sections must be written in separate answer books.

Q1(A) Give the answers in brief:

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|--------------|--|---|
| 1 | What is the advantage of Schottky diode? | 2 |
| 2 | Name the three terminals of MCT. | 3 |
| 3 | Which device provides complete electrical isolation between two circuits? | 1 |
| 4 | Define Holding current. | 2 |
| 5 | What is the advantage of connecting HEXFETs in parallel? | 2 |
| Q1(b) | Write short notes on LASCR. | 8 |
| Q2(a) | What is analogue? Discuss the working of a TRIAC with the help of a transistor analogue. | 8 |
| (b) | Describe voltage commutation and current commutation. | 8 |

OR

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|--------------|---|---|
| Q2(a) | Explain the switching characteristics and limitations of a power BJT. | 8 |
|--------------|---|---|

- (b) Determine V_p , R_{max} , R_{min} for a PUT trigger circuit. Assume $V_{BB} = 20\text{ V}$, $I_p = 100\ \mu\text{A}$, $C = 1\ \mu\text{F}$, $R_{B1} = 5\ \text{k}\Omega$, $R_{BB} = 14\ \text{k}\Omega$, $V_v = 1.5\ \text{V}$, $I_v = 6\ \text{mA}$, $R = 20\ \text{k}\Omega$. 8
- Q3 Answer any two:** 16
- 1 Three layer and five layer DIAC
 - 2 Enhancement type MOSFET
 - 3 Over current protection of power devices.
- Q-4(a)1** Define transformer utility factor. 2
- 2 Define: peak inverse voltage 2
 - 3 Give only the circuit diagram of fully controlled bridge rectifier with RL load & flywheel diode. 2
 - 4 Give only the circuit diagram of dual converter. 2
 - 5 Draw half controlled bridge rectifier in asymmetrical configuration. 2
- Q-4 (b)** A voltage, $220 \sin(100\pi t)$ is applied to a half wave uncontrolled rectifier with load resistance of $1\ \text{k}\Omega$. Calculate maximum current, RMS current, AC power input, DC power output. 8
- Q-5 (a)** Explain three phase full wave uncontrolled bridge rectifier & derive its ripple factor. 8
- (b) Derive expression for efficiency for half wave rectifier with help of circuit and voltage and current waveforms and derive ripple factor and TUF. 8
- OR**
- Q-5 (a)** Explain full wave rectifier with transformer leakage reactance & load reactance with voltage & current waveforms. 8
- (b) Derive the expression for ripple factor of half controlled bridge rectifier with resistive load along with circuit & voltage current waveforms. 8
- Q-6 Attempt any two questions:** 16
- (a) Derive expression for form factor of half wave controlled rectifier with resistive inductive load along with circuit & voltage & current waveform & quadrant operation.
 - (b) Explain centre tapped full wave uncontrolled rectifier.
 - (c) Derive expression for TUF of full wave midpoint controlled rectifier.