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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  SIXTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019 | | | | | |
| **Course Code: AE312** | | | | | |
| **Course Name: POWER ELECTRONICS** | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
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| **PART A** | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | Marks |
| 1 | a) | Construction Figure -2marks  Explanation -4 marks  Comparison 4 points -2marks | | | (8) |
|  | b) | 4 modes explanation -1.5\*4 =6marks  Figure – 1mark | | | (7) |
|  |  |  | | |  |
| 2 | a) | Turn on characteristics and explanation– 3.5 marks  Turn off characteristics and explanation – 3.5 marks | | | (7) |
|  | b) | Circuit – 1mark  Description -3marks  Waveform -1 marks  Any two methods to improve power factor – (1.5\*2) =3 marks | | | (8) |
|  |  |  | | |  |
| 3 | a) | Circuit diagram -1mark  Waveform – 2 marks  Explanation -3 marks | | | (6) |
|  | b) | Circuit diagram -1mark  Waveform – 2 marks  Explanation -3marks  Derivation of RMS and Average voltage – 3marks | | | (9) |
|  |  |  | | |  |
|  |  |  | | |  |
| **PART B** | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | |
| 4 | a) | 1 quadrant operation -3 marks  2 quadrant operation -3 marks  Circuit diagram -1mark | | | (7) |
|  | b) | Each expression – 2 marks\*4 | | | (8) |
|  |  |  | | |  |
| 5 | a) | Circuit diagram – 2marks  Waveform -2 marks  Explanation – 3 marks | | | (7) |
|  | b) | Circuit diagram – 1 mark  Waveform – 2 marks  5 Modes of operation -5marks | | | (8) |
|  |  |  | | |  |
| 6 | a) | Circuit diagram – 1.5 marks  Waveform – 2.5 mark  Explanation – 4 marks | | | (8) |
|  | b) | Single PWM -2marks  Multiple PWM- 2marks  Sine PWM-3marks | | | (7) |
|  |  |  | | |  |
|  |  |  | | |  |
| **PART C** | | | | | |
| ***Answer any two full questions,each carries 20 marks.*** | | | | | |
| 7 | a) | Circuit diagram – 2 marks  Waveform – 2marks  Output Voltage equation -2marks  Explanation -4 marks | | | (10) |
|  | b) | Driver circuit diagram -1 mark  Description and design -4mark | | | (5) |
|  | c) | Circuit diagram-1mark  Description and waveform -4mark | | | (5) |
| 8 | a) | Online UPS – 4marks  Offline UPS – 4 marks | | | (8) |
|  | b) | Any circuit -2marks  Explanation -5 marks | | | (7) |
|  | c) | Converter diagram-1mark  Explanation – 4 marks | | | (5) |
| 9 | a) | 2 isolation circuits – 4marks each | | | (8) |
|  | b) | Explanation -5 marks  Circuit diagram – 2 marks | | | (7) |
|  | c) | Circuit – 1mark  Explanation -4 marks | | | (5) |
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