Unit 3 - Week 2
### Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. **Due on 2018-09-05, 23:59 IST.**

Each question has “1” mark and there is no negative mark.

1) Calculate the switching time for which active vectors are applied in space vector PWM for 2 level inverter, if the dc link voltage is 200 V and the reference voltage is 150 V at an angle $\theta = 45$ degree. Let consider sampling frequency is 10 kHz.

- $T_1 = 22.41 \mu$s and $T_2 = 61.23 \mu$s
- $T_2 = 22.41 \mu$s and $T_3 = 61.23 \mu$s
- $T_3 = 22.41 \mu$s and $T_2 = 61.23 \mu$s
- $T_1 = 22.41 \mu$s and $T_2 = 61.23 \mu$s

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- $T_1 = 22.41 \mu$s and $T_2 = 61.23 \mu$s

2) The three phase (R Y B) modulating waves used in third harmonic injection PWM scheme has $V_{ref}$ per unit sampled data of 0.7542, 0.5333 and 0.7542 respectively at $wt = 45$, 90 and 135 degrees. Determine peak phase of fundamental modulating signal.....p.u and third harmonic component amplitude (k) .....?

- 0.8 p.u and 0.333
- 1.15 p.u and 1/6
- 1.05 and 1/4
- 0.7 p.u and 1/6

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- 0.8 p.u and 0.333

3) In The above question (Q2) Find the highest possible line side fundamental voltage (assuming $V_{dc} = 560$) during linear modulation for above value of $k$ ......? $V$

- 578.07 V
- 438.07 V
- 514.0 V
- 498.07 V

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- 514.0 V

4) A three phase inverter fed 400V, 50Hz, 4 pol IM is operating at steady state in the linear zone and maintaining V/f ratio. The inverter switched using convectional space vector PWM the sampling frequency is 10 KHz. In a given sampling interval line voltage Vry has positive...
pulse of width 50µsec and Vbr has a negative pulse of width 79µs. Determine the active states applied in the given sub cycle. Find the sector..... And what are the dwell times of the inverter states applied...... (Common for question Q5)

- 1, \( T_1 = 50\mu s \) and \( T_2 = 29\mu s \)
- 2, \( T_1 = 50\mu s \) and \( T_2 = 29\mu s \)

No, the answer is incorrect.
Score: 0
Accepted Answers:

1, \( T_1 = 50\mu s \) and \( T_2 = 29\mu s \)

5) By using above question (Q4). If the DC bus voltage is 560 V then what is the corresponding fundamental frequency? 1 point

- 39.49 Hz
- 48.39 Hz
- 58.39 Hz
- 37.39 Hz

No, the answer is incorrect.
Score: 0
Accepted Answers:

39.49 Hz

6) A two level inverter is switched using third harmonic injection PWM the total DC bus voltage is 600 V. the duty ratios of the three phases in a given half carrier cycle are \( d_R = 0.637, d_Y = 0.933 \) and \( d_B = 0.080 \). Assume steady operation and linear modulations; find the peek phase fundamental voltage applied on the load ..... V? 1 point

- 349.1 V
- 299.1 V
- 589.1 V
- 234.9 V

No, the answer is incorrect.
Score: 0
Accepted Answers:

299.1 V

7) Write switching sequence of three level NPC multilevel inverter of modulation index is 0.2 for phase disposition (PD) by using +,0,- for one carrier cycle at \( \omega t = 30^0 \) 1 point

- +0+, +00, 000, 0-0, 000, +00, +0+
- +0+, 0-0, 000, 0-0, +0+
- +0-, 0,000,0-0,+-0
- +0+, 000, 0-0, 000, +0+

No, the answer is incorrect.
Score: 0
8) Write switching sequence of three level NPC multilevel inverter of modulation 1 point index is 0.8 for phase opposite disposition (POD) by using +,0,− for one carrier cycle at \( \omega t = 45^0 \)

- +0+, 000, 0-0, 000, +0+
- +++,+-0,000,0-0,+-+
- +++, +0+, 0-0, 000, +0+, +++
- +0+,+-0,000,0-0,+-+,0+

No, the answer is incorrect.  Score: 0

Accepted Answers: 
+ +++, +00, 000, 0-0, 000, +0+, +0+
+-+,+-0,000,0-0,+-+,+-+
+++, +0+, 0-0, 000, +0+, +++
+0+,+-0,000,0-0,+-+,+0+

9) A multilevel inverter supplied by a DC bus voltage 100 V is controlled using three level SVM with sampling frequency 10 KHz. Calculate the dwell times of various vectors to generate a reference vector 56 V with an angle of 45 degree for unity power factor load

- \( T_1 = 8.346 \) microsecond
- \( T_2 = 66.5275 \) microsecond
- \( T_3 = 8.545 \) microsecond
- \( T_5 = 24.927 \) microsecond

No, the answer is incorrect.  Score: 0

Accepted Answers:
\( T_5 = 66.5275 \) microsecond

10) Repeat the above problem (Q9), when it is working as STATCOM

- \( T_1 = 8.346 \) microsecond
- \( T_5 = 66.5275 \) microsecond
- \( T_6 = 24.927 \) microsecond
- \( T_{12} = 24.927 \) microsecond

No, the answer is incorrect.  Score: 0

Accepted Answers:
\( T_6 = 24.927 \) microsecond