Assignment-3

The due date for submitting this assignment has passed. Due on 2018-03-07, 23:59 IST.

Submitted assignment

1) One of the main functions of the CNC interpolator is to
   - Move the cutter along the programmed path 1 point
   - Start the spindle rotation
   - Interpolate between two spindle speeds
   - None of the others

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Move the cutter along the programmed path

2) A Digital differential analyzer (DDA, fig given) is to emit \( c = 3000 \text{ ppm} \). \( X \) is the content inside the \( n \) bit counter and gets added once to the content of the Q register for every pulse. The input pulse frequency \( f \) is 6000 ppm, \( n = 4 \). In order that the overflow pulses from Q register be 3000 ppm, the content \( X \) of the \( n \) bit register is nearest to

   \[
   f \rightarrow \text{Q register} \rightarrow c
   \]

   - 32
   - 8
   - 16
   - 4

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   8

3) A student connects up the output of a DDA to the down-counting input point of the \( p \) register with content \( X \).
   As a result, the output \( C \) will
4) The definition of the circle in the figure

- Is not possible due to insufficient data
- Is possible as sufficient data is provided

No, the answer is incorrect.
Score: 0
Accepted Answers:
Is possible as sufficient data is provided

5) Assuming that c2 and l2 are already defined, the definition of the counterclockwise circle c1 (of radius 5 mm) as shown in the figure is

- c1=c2,l2,r5
- c1=-c2,-l2,r5
- c1=-l2,-c2,r5
- c1=-l2,c2,r5
6) The definition of the line \( l_1 \) will be

\[ \overrightarrow{c_1}, a_{45} \]

None of the others

No, the answer is incorrect.
Score: 0
Accepted Answers:
\( c_1=-l_2, c_2, r_5 \)

7) A bevel gear differential is getting two rotation inputs from two stepper motors. These rotations are ultimately defining the rotation of the output shaft. It is required that the rpm ratios of the two stepper motors cover all ratios \( x:y \), where \( x \) and \( y \) can be any single digit integers prime to each other, examples: \( 1:2, 2:1, 4:5, 8:9, 3:7, 5:7 \) etc
In that case, the cheapest device that would be able to serve the two stepper motors will be a 2-DDA interpolator as shown.

- n=3
- n=4
- n=5
- None of these

**No, the answer is incorrect.**
**Score: 0**
**Accepted Answers:**
- n=4

8) In case of 2-axis circular interpolation

- Speed of one axis motor remains constant while the motor in the other axis varies
- Speed of both the motors are varied
- Speed of the motors are varied but the ratio remains constant
- None of these

**No, the answer is incorrect.**
**Score: 0**
**Accepted Answers:**
- Speed of both the motors are varied

9) In a CNC hardware interpolator, the feed DDA starts malfunctioning and has to be replaced. An exact replacement is not available in the market and the DDA with nearest specification has registers two bits larger in size than the required one. If that DDA replaces the malfunctioning DDA,
Profile error will occur
Actual feed will be 4 times the programmed feed
Actual feed will be 4 times less than the programmed feed
None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
Actual feed will be 4 times less than the programmed feed

10. The highest frequency pulse output from a DDA having n bits and input frequency f, is nearest to
   • f
   • f/2
   • f(2^n-1)/2^n
   • None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
f(2^n-1)/2^n