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① 0 1 2 3 4 5 6 7 8 9 10
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5 POINTS EACH: DISTANCE, PEER-TO-PEER VS. HOST-CLIENT

② 0 1 2 3 4 5 6 7 8 9 10
= = = = =

10 POINTS: HI-Z LOAD & SOURCE MATCH

~5 POINTS: REDUCE LOGIC VOLTAGE, REDUCE DUTY FACTOR

~5 POINTS: INCREASE T-LINE & MAINTAIN $R_L = Z_C$

~5 POINTS: INCREASE R_L , ALLOW REFLECTIONS

~8 POINTS: MATCH AT SOURCE

③ 0 1 2 3 4 5 6 7 8 9 10
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~8 POINTS: GRAPHIC TECHNIQUE IS SLOPPY, INACCURATE

~5 POINTS: KNOWS SOLN IS INTERSECTION OF TWO FUNCTIONS

④ 0 1 2 3 4 5 6 7 8 9 10
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+3 POINTS: SOLN INVOLVES A TASK SCHEDULER

+3 POINTS: 100 TICS

+4 POINTS: ALLOWS OTHER CODE TO RUN DURING PULSE

⑤ 0 1 2 3 4 5 6 7 8 9 10
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10 POINTS, MATRIX, GHOSTING OR ROLLOVER MENTIONED

~8 POINTS, NO LIMITATIONS MENTIONED OR 2×12 MATRIX

~7 POINTS, CAN'T BE DONE, MATRIX MENTIONED & DISMISSED

~3 POINTS CAN'T BE DONE, NEED 24 PINS OR PORT EXPANSION

~1 POINT, CAN'T BE DONE & DOGS REASONING

⑥ 0 1 2 3 4 5 6 7 8 9 10
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7 POINTS: VECTORED HAS IDENTIFIED ISR, POLLED IS JUST POLLED

3 POINTS: VECTORED USES INTERRUPTS, POLLED DOES NOT

⑦ 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
= = = = =

~8 POINTS: SIGNIFICANT ERRORS BUT FAILURE CONCLUDED

~5 POINTS: CORRECT TABULAR ITEMIZATION OF SPECS,



⑧ 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

GRAY CODE APPROACH

3 POINTS - 5 BITS

4 POINTS - GRAY MENTIONED

4 POINTS - INTERRUPTS DESCRIBED

4 POINTS - PROCESSING OR TABLE

V-SCAN APPROACH

3 POINTS - 9 SENSORS

4 PTS - BINARY CODE

4 PTS - INTR ON LSB CHANGE

7 PTS - SIMULTANEOUS SAMPLING & PROCESSING

RELATIVE ENCODER APPROACH

QUAD ~ 3 PTS

SINGLE - B0 ~ 2 PTS

BINARY APPROACH

~ 8 POINTS - NO MENTION OF ISSUES

⑨ 0 1 2 3 4 5 6 7 8 9 10
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5 POINTS LOWPASS & CUTOFF & ANALOG

5 POINTS GAIN = 100

$$\bar{x} = 64.6$$

$$\sigma = 25.8$$