UNIVERSITI TEKNOLOGI MARA
SAMPLE TEST No. 1

COURSE : CHEMICAL PROCESS CONTROL
COURSE CODE : CPE562
EXAMINATION : 5 NOVEMBER 2012
TIME : 1 HOUR 20 MINUTES

INSTRUCTIONS TO CANDIDATES

1 This question paper consists of two (2) questions.
2 Answer ALL questions on the space provided.
3 Do not bring any material into the examination room unless permission is given by the invigilator.

Name: ______________________________
Matric No.: __________________________
Group: ______________________________

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QUESTION 1

a) Construct P&ID for the following control scheme based on ANSI/ISA 5.1-1984(R1992) standard. The process flow diagram is shown in Figure 1.

i) Vessel's gas pressure control with in-line pressure relief valve  (3 marks)

ii) Liquid level control with low liquid level alarm  (3 marks)

iii) Liquid+gas flow cut-off upon high-high liquid level condition  (3 marks)

Figure 1 Gas-liquid separation vessel.
b) Figure 2 shows a P&ID of a control loop. Answer the following question based on ISA 5.1-1984 standard.

i. What is the name for the device as depicted by ①.

   (1 marks)

ii. What is the name for the device as depicted by ②.

   (1 marks)

iii. Where is the location of the device as depicted by ③?

   (1 marks)

Figure 2  P&ID of a control system.
QUESTION 2

a) Calculate $C/R$ for the following system.

\[ R \rightarrow \times \times \rightarrow 5 \rightarrow \frac{1}{5s + 1} \rightarrow \frac{1}{s} \rightarrow C \]

(8 marks)

b) Draw a block diagram for the following equation.

(4 marks)

\[ x_3 = 5 \frac{d^2 x_2}{dt^2} + 3 \frac{dx_1}{dt} - x \]