UNIVERSITI TUN HUSSEIN ONN MALAYSIA

PEPERIKSAAN AKHIR
SEMESTER I
SESI 2010/2011

NAMA KURSUS	:	TEKNOLOGI PENGAWALAN PEMBUATAN
KOD KURSUS	:	BDD 4083
PROGRAM	:	4 BDD
TARIKH PEPERIKSAAN	:	NOVEMBER/DISEMBER 2010
JANGKA MASA	:	2 JAM 30 MINIT
ARAHAN	:	JAWAB EMPAT (4) SOALAN SAHAJA DARIPADA ENAM (6) SOALAN.

KERTAS SOALAN INI MENGANDUNGI TIGA (3) MUKA SURAT BERCETAK

Q1 A mass – spring system has the following parameters;

Stiffness K = 800 N/m, Mass M = 3 kg, Damping coefficient k_d = 20 Ns/m

(a) Calculate the time constant, critical damping coefficient and the damping ratio.
(6 marks)

(b) Derive the equation for the force required when the piston is accelerating.
(5 marks)

(c) Use the equation from the previous answer (b) to evaluate the static deflection when F = 12N.
(3 marks)

(d) Use the equation from the previous answer (b) to evaluate the force needed to make the mass accelerate at 4 m/s^2 at the moment when the velocity is 0.5 m/s.
(6 marks)

Q2 Question 2 refers to the following sequence;

A+ B+ C+ B- A- B+ C- B-

During step C-, the sequence step will halt for 10 seconds. **A** represents linear cylinder at x-axis, **B** represents linear cylinder at z-axis and **C** represents a pneumatic gripper (**C+** means clamp, **C-** means release). Assume that each components is controlled by 5/2 way Directional Control Valve Single Solenoid and has two reed switches. Generate the PLC programming for the above sequence.
(20 marks)

Q3 (a) Discuss the differences between Programmable Logic Controller (PLC), microcontroller and personal computer (PC) in term of its setup difficulties, robustness, cost and control flexibilities.
(12 marks)

(b) Briefly explain the automation elements.
(8 marks)

Q4 (a) Identify FIVE (5) types of wireless communication medium. Suggest in where those wireless communication types could be applied in industry?
(10 marks)

(b) How Supervisory Control and Data Acquisition (SCADA) could help in achieving an agile manufacturing level for a factory?
(10 marks)

Q5 (a) *Automated Guided Vehicle* (AGV) is an option to deliver materials in the factory. Justify the pros and cons of using AGV compared to fixed type roller conveyors as the material transporters.

(10 marks)

(b) There could be several problems occurred in the storage area which related to the inventory. Discuss FIVE (5) major problems faced by the manufacturers with the inventory in storage. Inventory could be finished product, work-in-process, raw materials/spare parts of the machineries.

(10 marks)

Q6 (a) With an appropriate example, determine FIVE (5) types of flexibilities that occurred in manufacturing system.

(10 marks)

(b) Intricate and complicated machine's operation such as detecting and removing the defect work-in-process silicon wafer in electronic industry at high speed is a major challenge for highly competent manufacturers. Determine how high speed processing controller helps these manufacturers to do such a tedious job?

(10 marks)