



PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Midterm Exam Second Semester

Academic Year 2016

Date 1 March 2016

Time 9:00-12:00

Course 225-554 Automation Manufacturing

Room S817

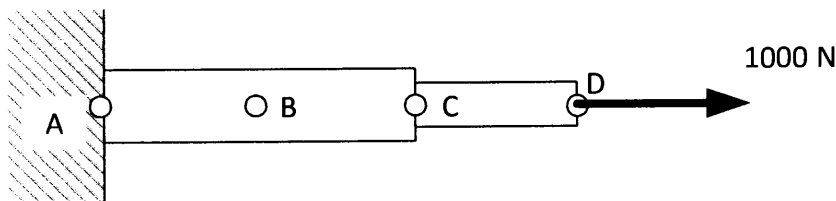
ทูลจรีตในการสอบ โทษชั้นต่ำ คีอ พักการเรียน 1 ภาคการศึกษา และปรับตกในรายวิชาที่ทูลจรีต

Instructions

1. There are a total of 10 questions and 100 points.
2. Answer the questions in an answer book provided.
3. Only dictionaries are allowed.

Supapan Chaiprapat

1. Mass customization becomes a new marketing strategy of today's business. However, not every manufacturer can successfully apply this concept. Discuss why. (10 points)
2. Compare advantages and drawbacks of three production systems namely *mass production*, *batch production* and *customization*. Give also examples and reasons to support your answer. (10 points)
3. In "*Earring Magic Ken*", what has *Mattel* done wrong with Ken? (5 points)
4. What really caused business disruption between *Ford* and *Firestone*? What should have been done to prevent such losses from happening again in the future? (10 points)
5. In "*Vehicle of the Future*", what are the concepts of *a car of the future*? (5 points)
6. Explain what "*Wirth Research*" has done with *Acura* to get it on top of *Peugeot* and *Audi*. (10 points)
7. Explain how CAE has helped *Service Precicad* with a new design of an electric utility car. (10 points)
8. What are design objectives of a packaging product? Are they similar or different from other typical products? (5 points)
9. Explain how we can come up with a new and more efficient design of a product. You can use a case study of the *bottle* as an example. (15 points)
10. Use a finite element method to derive a system of equations that will be solved for stress and deformation at A, B, C, and D, where B is at half way between A and C. Substitute given boundary conditions and an external load into the equations. (20 points)



Part	Area of Cross Section (cm ²)	Length (cm)	Modulus of Elasticity (N/m ²)
Longer Part	35	50	65×10 ⁹
Shorter Part	20	30	48×10 ⁹

$$\frac{AE}{L} \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} u_1 \\ u_2 \end{bmatrix} = \begin{bmatrix} F_1 \\ F_2 \end{bmatrix}$$