POLITEKNIK
Jabatan Pengajian Politeknik

EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION
(MINISTRY OF HIGHER EDUCATION)

MECHANICAL ENGINEERING DEPARTMENT

FINAL EXAMINATION

DECEMBER 2011 SESSION

JP201 : PACKAGING SCIENCE

DATE : 23 APRIL 2012 (MONDAY)
DURATION : 2 HOURS (11:15 AM – 01:15 PM)

This paper consists of **FIVE (5)** pages including the front page.
Essay (6 questions – answer 4 questions)

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QUESTION 1

a) State THREE (3) method of heat transfer.

(3marks)

b) Describe heat capacity and formula to getting value for heat capacity.

(4 Marks)

c) Object mass 3.5 kg absorb heat 4500 J, when temperature up from 40 ° C to 48° C. Determine
   i) Specific Heat Capacity
   ii) Object Heat Capacity

(6 marks)

d) 80g water at temperature 70°C mixed with 40g water at temperature 30° C. What is final temperature mixed about.

(6 marks)

e) Define substance hygroscopic.

(2 marks)

f) State temperature change below:

   i) 60°F scale to Celcius
   ii) 38°C scale to Fahrenheit

(4 marks)

QUESTION 2

a) State the term of
   i. Element
   ii. Mixture
   iii. Atom (9 marks)

b) State the list food commodity

(3 marks)

c) State the term of pH. (3 marks)

d) Describe factors that the protect from corrosion (10 marks)

QUESTION 3

a) State the adhesive (5 marks)

b) Describe categorize the adhesive from aspect:

i. Mechanical
ii. Molecular

(12 marks)

c) Describe the choosen of the adhsive in packaging

(8 marks)

QUESTION 4

a) Single light enter air from water. Given refractive absolute 1.33 and velocity light in air 3 x 10^8 m/s. Given point angle 34.6°. Draw figure for that condition and calculate:

i. Refraction angle
ii. Velocity of light in water

(8 marks)

b) Draw two type of lens that applied in real situation.

(6 marks)

c) State (2) **TWO** causes happen light refraction.

(2 marks)

d) State what is in Law Snell. (3 marks)

e) State defined basic below:

i. Optic
ii. Light
iii. Lens (6marks)

QUESTION 5

a) Describe light disperse and draw figure for this light disperse.

(4 marks)

b) Draw and label phenomena spectrum electromagnetic wave .

(4 marks)

c) State the meaning with added light colour and show schedule added primer colours for produce(3) colours secondary.

(5 marks)

d) State colour through filter

i) White light through filter red and filter magenta. (1 marks)

ii)White light through filter cyan , filter magenta and blue filter. (1 Marks)

iii)white colour yellow filter , cyan filter and green filter (1 marks)

iv)Red light to shine object green colour. (1 marks)

e) State 4 important colour in life.

(4 marks)

f) State defined (2) below

i) Hue/Chrome
ii) Purity

(4 marks)

QUESTION 6

a) State (4) **FOUR** virus design.

(4 marks)

b) State (4) **FOUR** factor influent affect reproduction microorganisms.

(2 marks)

c) Describe complete with (3) **THREE** method use in process discharge microorganisms

(12 marks)

d) SIRIM, JAS and Jabatan Hal Ehwal Pengguna responsible is country about food Product.

i) List (3) THREE function about this groups
ii) Describe what is a group to make sure all requirement regulation following production determined.