



## University Examination

THIRD TRIMESTER 2008/2009

## BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

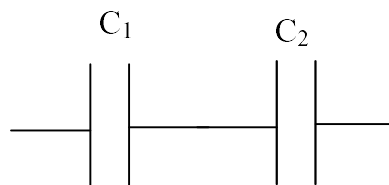
BBIT 1102: Basic Physics for BBIT

2 HOURS

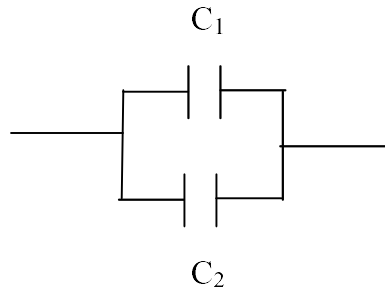
## SECTION A: Answer ALL questions from this section [30mks]

## Question One

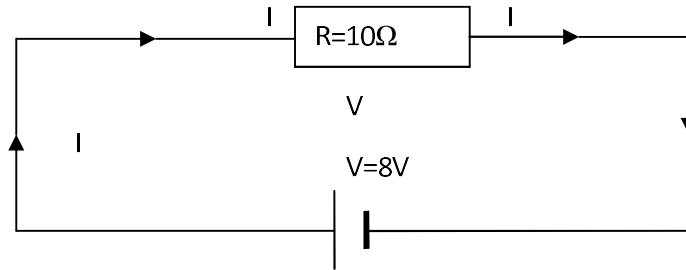
- a. Name the three states of matter (3mks)
- b. Sketch a displacement-distance graph for a transverse wave, showing two complete cycles. Mark on your graph distances to show what is meant by wavelength and amplitude (3mks)
- c. An object is placed 25 cm from a concave mirror of focal length of 20cm the mirror. Find the distance of the image from the mirror. (3mks)
- d. List three factors affecting the resistance of a conductor (3mks)
- e. i. State Ohm's Law (1mk)  
ii. Two resistors of  $3\Omega$  and  $6\Omega$  are connected in parallel across a p.d. of 6V. Find the total current in the circuit. (3mks)
- f. i. Draw the symbol of a p-n junction diode and indicate the direction of conventional current flow. (2mk)  
ii. What does "biasing" a diode mean? Using well labeled diagrams, differentiate between forward bias and reverse bias. (2mks)
- g. What is a capacitor? (1mk)
- h. Given that  $C_1$  and  $C_2$  are  $2\mu\text{F}$  and  $3\mu\text{F}$  respectively, calculate the combined capacitance in the arrangement below. (3mks)



- i. Define a dielectric (1mk)
- j. Given that  $C_1$  and  $C_2$  are  $5\mu\text{F}$  and  $7\mu\text{F}$  respectively, calculate the combined capacitance in the arrangement below. (2mks)



k. Calculate the current in the following circuit (3mks)



**SECTION B: Answer TWO questions from this section [40mks]**

**Question 2**

- a. Arrange the following in their order of increasing wavelength; blue light, ultraviolet rays, radio waves, gamma rays, infrared rays. (2mks)
- b. i) Define the refractive index of a material (2mks)
- ii) Define the critical angle for a material (2mks)
- c. Determine the refractive index of a material if light travels through this material at a speed of  $1.5 \times 10^8 \text{ms}^{-1}$  (4mks)
- d. i. Name four properties of light (4mks)
- ii. Find the angle of refraction when
  - I. a ray of light travels from air to glass at an angle of incidence of  $40^\circ$  (3mks)
  - II. a ray of light is traveling from glass to air at an angle of  $20^\circ$  (3mks)
 (Take  $n_g = 1.5$ )

#### Question 4

- a. Use well labeled diagrams to explain how rays of light behave as they move from one side of lens to the other. (4mks)
- b. State the laws of electromagnetic induction (2mks)
- c. Describe conditions for Total internal reflection (T.I.R.) (2mks)
- d. Explain how an optic fibre works (2mks)
- e.
  - i. Differentiate between a step-up transformer and a step-down transformer (4mk)
  - ii. Name and describe any two sources of power loss in transformers and how they can be minimized (6mks)

#### Question 5

- a. Name and explain the two ways in which current is induced in a coil (6mks)
- b. Explain what happens when the forward voltage across a p-n junction is gradually increased from zero (2mks)
- c. Describe the mechanisms responsible for junction break down under increasing reverse voltage. (6mks)
- d. Explain why silicon n-p-n transistors are preferred over other types of transistors. (4mks)
- e. Name two applications of transistors (2mks)