



Department of Electronic and Computer Engineering

B324 Electronics Manufacturing

Semester 2 Examination

1.5 hours

Instructions:	Write your student ID number clearly on page 2. Write your answers to all 5 questions within the spaces provided in this examination paper. Handwritten notes are permitted with this examination.
Additional Information:	This is an open book exam
Provided:	None
Calculators:	Casio FX 85 Series or Casio FX 83 Series
Examiners:	Mr C Nguyen
External Examiner:	Professor R Pethig

Student ID Number

QUESTION 1

(a) Place an "X" in the box next to **3 issues** that have been **most directly and significantly affected** by the **division of labour** principle. **[6 Marks]**

- | | |
|--------------------------|---------------------------|
| <input type="checkbox"/> | intra-company competition |
| <input type="checkbox"/> | economic competition |
| <input type="checkbox"/> | career progression |
| <input type="checkbox"/> | international trade |
| <input type="checkbox"/> | regional trade |

- | | |
|--------------------------|-------------------------|
| <input type="checkbox"/> | agricultural revolution |
| <input type="checkbox"/> | gender stereotypes |
| <input type="checkbox"/> | age stereotypes |
| <input type="checkbox"/> | product recycling |
| <input type="checkbox"/> | waste recycling |

(b) Provide an **explanation of the effects due to the division of labour principle** and a **supporting example** for **each of the terms** selected in part (a). **[14 Marks]**

QUESTION 2

(a) Place an "X" in the box next to **3 areas** that have **the most differences** between the **craftsman production method** as compared to the **factory production method**. **[6 Marks]**

<input type="checkbox"/>	responsibility for quality	<input type="checkbox"/>	access to transportation
<input type="checkbox"/>	responsibility for safety	<input type="checkbox"/>	access to markets
<input type="checkbox"/>	international skill level	<input type="checkbox"/>	production resources
<input type="checkbox"/>	individual skill level	<input type="checkbox"/>	production location
<input type="checkbox"/>	national skill level	<input type="checkbox"/>	production tools

(b) Provide an **explanation for the difference** and a **supporting example** for **each of the terms** selected in part (a). **[14 Marks]**

QUESTION 3

(a) Place an "X" in the box next to **3 issues** that are **most significantly different** between a person who operates a business as **self-employment or sole proprietor** as compared to a person who operates a business as a **company limited by shares**. **[6 Marks]**

<input type="checkbox"/>	product development
<input type="checkbox"/>	production tools
<input type="checkbox"/>	startup costs
<input type="checkbox"/>	marketing
<input type="checkbox"/>	liability

<input type="checkbox"/>	intellectual property
<input type="checkbox"/>	legal entity
<input type="checkbox"/>	ownership
<input type="checkbox"/>	location
<input type="checkbox"/>	sales

(b) Provide an **explanation of the difference** and a **supporting example** for each of the terms selected in part (a). **[14 Marks]**

QUESTION 4

(a) Place an "X" in the box next to **3 terms** that are **most directly related** to the use of **linear programming in supply chain planning and analysis**. **[6 Marks]**

<input type="checkbox"/>	minimum function	<input type="checkbox"/>	objective function
<input type="checkbox"/>	maximum function	<input type="checkbox"/>	input constraints
<input type="checkbox"/>	matrix parameters	<input type="checkbox"/>	optimal constraints
<input type="checkbox"/>	product parameters	<input type="checkbox"/>	functional constraints
<input type="checkbox"/>	business parameters	<input type="checkbox"/>	nonnegativity constraints

(b) Formulate the following problem so that it can be solved using linear programming. Identify the specific part for each of the terms selected in part (a). **[14 Marks]**

A small factory generates 11 containers of waste solvents, 14 containers of waste acids and 18 containers of waste oils on a daily basis. Express Waste charges £400 for each truck that they send to collect waste containers. Each truck may carry 1 container of waste solvents, 2 containers of waste acids and 3 containers of waste oils. Global Waste charges £600 for each truck. But, each truck may carry 2 containers of waste solvents, 2 containers and waste acids and 2 containers of waste oils. Identify the lowest cost for the factory to properly dispose of its waste each day.

QUESTION 5

(a) Place an "X" in the box next to **3 terms** that are **most directly related** to the classic inventory model, **Economic Order Quantity (EOQ)**. **[6 Marks]**

<input type="checkbox"/>	unit holding time	<input type="checkbox"/>	optimum revenue per year
<input type="checkbox"/>	unit holding cost	<input type="checkbox"/>	optimum orders per year
<input type="checkbox"/>	unit holding revenue	<input type="checkbox"/>	optimum profits per year
<input type="checkbox"/>	total annual inventory	<input type="checkbox"/>	planned annual revenue
<input type="checkbox"/>	total annual cost of inventory	<input type="checkbox"/>	planned annual orders

(b) Calculate the average order frequency using the EOQ model and the values provided below. **[14 Marks]**
Indicate the values for each term selected in part (a).

- | | |
|--|------------------------|
| On average, 40 products sold per day | Each product costs £50 |
| On average, business is open 200 days per year | Each order costs £25 |
| Annual cost of storage is 25% of product costs | |