



**DESIGN TECHNOLOGY  
HIGHER LEVEL  
PAPER 3**

Wednesday 12 November 2008 (morning)

1 hour 15 minutes

Candidate session number

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**INSTRUCTIONS TO CANDIDATES**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions from two of the Options in the spaces provided. You may continue your answers on answer sheets. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.
- At the end of the examination, indicate the letters of the Options answered in the candidate box on your cover sheet and indicate the number of answer sheets used in the appropriate box on your cover sheet.



**Option D — Food technology**

**D1.** Jerky is a meat (beef, poultry, fish or game) product that is nutrient rich, convenient and has an extended shelf life (**Figure D1**). It is produced by, thinly cutting the meat, salting, and then smoking and/or drying it. It is often stored in a re-sealable plastic bag (**Figure D2**) that has a food label.

**Figure D1: Jerky meat**



[Source: www.askthemeatman.com]

**Figure D2: Re-sealable plastic bag**



[Source: www.manekineko.us]

(a) State **one** organoleptic property that will be affected in the production of Jerky from fresh meat. [1]

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(b) Outline **one** reason why the high salt content of Jerky might discourage its consumption. [2]

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(c) Explain how dehydration extends the shelf life of meat. [3]

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**D2.** (a) Define *food spoilage*. [1]

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(b) Outline **one** lifestyle factor that led to the development of dried foods such as Jerky. [2]

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**D3.** Outline **one** factor that has led to the development of an international cuisine. [2]

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**D4.** Discuss **three** issues for farmers arising from the use of genetically modified organisms. [9]

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**Option E — Computer-aided design, manufacture and production**

**E1.** **Figure E1** shows a CAD system often used in the textile industry. **Figure E2** is a scarf, which is an example of an artefact that can be made with CAD/CAM.

**Figure E1: CAD system**



**Figure E2: Scarf**



[Source: Advanced Design and Technology, Norman, Cubitt, Urry & Whittaker]

[Source: www.chinawholesalegift.com]

(a) State **one** advantage of using a CAD software package in the design of the scarf. [1]

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(b) Describe how CAD can be integrated with CAM to produce a scarf. [2]

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(c) Explain **one** way CAD/CAM impacts on consumer choice of scarves. [3]

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**E2.** (a) Define *mass customization*. [1]

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(b) Outline **one** advantage of mass customization for the manufacturer. [2]

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**E3.** Outline **one** reason why manufacturers find it difficult to adapt to lean production. [2]

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**E4.** Discuss **three** strategies designers could employ for design for manufacture.

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**Option F — Invention, innovation and design**

**F1.** Thomas Edison, who invented the incandescent light bulb (**Figure F1**) is considered to be an example of an “Inventor – Entrepreneur”. Since his initial design the light bulb has been redesigned many times. The halogen lamp in **Figure F2** is an example of a redesign.

**Figure F1: Incandescent light bulb**



[Source: www.globalwarmingart.com]

**Figure F2: Halogen lamp**



[Source: www.pegasusassociates.com]

(a) Define *invention*. [1]

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(b) List **two** reasons why Edison’s lamp was a dominant design. [2]

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(c) Explain **one** reason why Thomas Edison is considered an inventor – entrepreneur. [3]

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**F2.** (a) Define *market pull*. [1]

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(b) Describe **one** change that could be made to the design specification of the light bulb in Figure F1 to make it more environmentally friendly. [2]

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**F3.** Outline how different lifestyles affect market segmentation for bicycles. [2]

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**Option G — Health by design**

**G1.** The motor vehicle has become an integral part of many people’s lifestyles as they have come to rely on it for a range of work and recreational activities. As a result, it has had a significant effect on society and the environment. **Figure G1** shows car congestion.

**Figure G1: Car congestion**



[Source: www.thepanamanews.com]

(a) State **one** pollutant present in car exhaust. [1]

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(b) Outline the function of a catalytic converter that is used in cars. [2]

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(c) Explain the role of legislation in encouraging motor vehicle research and development. [3]

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**G2.** (a) Define *user-centred design*. [1]

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(b) Outline **one** advantage of using elastomers in tissue implants. [2]

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**G3.** Outline **one** implication of blindness in the developing world. [2]

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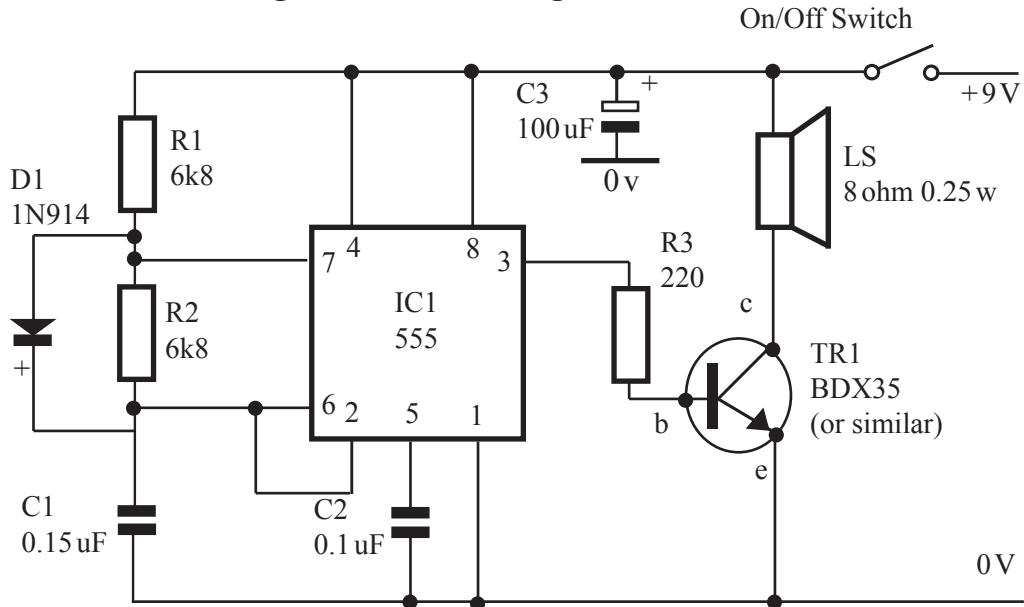




**Option H —Electronic products**

**H1.** Figure H1 is a circuit diagram of an alarm.

**Figure H1: Circuit diagram of an alarm**



(a) State the voltage of the power source for the diagram in Figure H1. [1]

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(b) Describe the function of the resistor at R3 in the diagram in Figure H1. [2]

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(c) Explain how the circuit operates to trigger the alarm. [3]

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**H2.** (a) State the component that would be used to provide feedback in a temperature sensing circuit. *[1]*

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(b) Outline **one** major difference between an open-loop and closed-loop circuit. *[2]*

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**H3.** Outline how contactless smart cards work. *[2]*

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