1145-532 MAY 2018
Level 3 Advanced Technical Diploma in Engineering (540)/
Level 3 Advanced Technical Extended Diploma in Engineering (720)
Level 3 Engineering – Theory Exam (2)

If provided, stick your candidate barcode label here.

Wednesday 23 May 2018
09:30 – 11:30

General instructions

• Use black or blue ballpoint pen.
• The marks for questions are shown in brackets.
• There are six questions in this examination paper. Answer all questions.
• Answer the questions in the spaces provided. Answers written in margins will not be marked.
• Cross through any work you do not want to be marked.
• Write all your working out and answers in this booklet.
• If extra space is required then the blank pages at the back of the pack should be used, clearly identifying the question.
1 One of the issues a company has to deal with is health and safety in its UK premises. The main piece of legislation the company will have to comply with is the Health and Safety at Work Act 1974.

a) Explain what is meant by ‘as far as is reasonably practicable’.

b) Explain how risk assessments can **minimise** the probability of injury in a working environment.

(Total marks 10)
2 a) Explain why pre-tensioning may be needed when assembling mechanical components. (2 marks)

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b) In the table below, state two common types of electrical cable. For each, state a typical use. (4 marks)

<table>
<thead>
<tr>
<th>Type of cable</th>
<th>Typical use</th>
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(Total marks 6)
3 a) Explain the difference between market pull and technology push. (2 marks)

b) An entrepreneur wants to invest in a business. Explain how entrepreneurs can be enablers for innovation. (6 marks)
c) Some parts of a product need to be made as prototypes to see how they fit together. Describe how a prototype of a product can be made using 3D printing. (4 marks)

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d) Describe how market testing of a product would be carried out. (4 marks)

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(Total marks 16)
A product is going to use a low carbon technology to generate energy. Explain how the use of low carbon technologies to convert waste into energy affects the environment. (8 marks)

(Total marks 8)
5 a) Explain the difference between virtual and augmented reality. (2 marks)

b) Virtual reality and augmented reality are finding an increasing number of domestic and industrial applications. Explain how the further development of virtual and augmented reality could lead to innovative products. Your answer should include examples of potential applications of virtual and augmented reality. (6 marks)

(Total marks 8)
Discuss the influence that digital technologies have had on society. (12 marks)