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Design & Technology Edexcel A-Level

Sample Set 1 Paper – 9DT0/01 2 hours 30 minutes

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

Good luck!

120 marks

Q1) The image shows a large table. The tabletop is made from veneered chipboard.



Q1a) Name two alternative manufactured boards which could be used instead of chipboard for the tabletop (2 marks)

Q1b) Explain **three** reasons why a veneered chipboard top is more suited to this design than a solid timber top. **(6 marks)**

Q2) The image shows a design for a footbridge.



Q2a) The timber decking will use preservatives as a finish. Explain two reasons for this finish. (4 marks)

Q2b) Calculate the length of the column. All measurements are in mm (3 marks)

Q2c) Two reinforced concrete beams are designed to support the footbridge. The beams are 6m long and a of the beams is show below. What is the volume of concrete needed for both the beams. All measurements are in mm. (4 marks)



Q3) The image below shows an engine part made form stainless steel.



Q3a) Explain one reason stainless steel is suitable for the engine part (2 marks)

Q3b) Describe, using annotated sketches, the process of investment casting the engine part. **(6 marks)**

Q3c) Explain **two** advantages of using investment casting rather than sand casting for making the engine part **(6 marks)**

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Q3d) The engine part has four quality control checks. The probability of failure for each check is shown below

- Fail in check A: 0.02
- Fail in check B: 0.043
- Fail in check C: 0.005
- Fail in check D: 0.012

A part will fail the quality control check if A, B and C fail together or if D fails. If 20,000 parts are made, estimate how many will fail **(4 marks)**

Q4) A designer has decided to get a patent for an invention. Name the office in the UK that grants patents (1 mark)

Q4b) Evaluate the use of a patent to protect a design idea (6 marks)

Q4d) The role of the British Standards Institute (BSI) is to promote safety and quality throughout product manufacture and usage.

Evaluate the advantages and disadvantages to a business of ensuring their practices and products comply with BSI standards **(8 marks)**

Q4e) Some sheet metal is being cut for a car door. If the density of the metal is 2.8g/cm³ and the metal is 6mm thick. What is the mass of the sheet metal? All measurements are in mm **(6 marks)**



Q5) The plastic tugboat is made from polyethylene.



Q5a) Discuss the suitability of polymer-based materials for children's toys during play activities. **(6 marks)**



Q5b) The tugboat will be made in two parts and joint together using solvent adhesive. Explain the safe work practices necessary to protect workers when using solvent adhesives **(6 marks)**

Q6) Evaluate the use of a flexible manufacturing system, compared to dedicated automated machinery, in production **(9 marks)**

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Q7) The image shows Otto Wagner's Majolica House designed and constructed during the Art Nouveau period.



Discuss how the design of the Métro station entrance was influenced by Art Nouveau philosophies. (9 marks)

Q8a) Phosphorescent pigment can be used in indoor emergency signage

Explain **three** reasons why phosphorescent pigment is suitable for indoor emergency signage. (9 marks)

1. _____

2.

3.		

Q8b) Before the signs are made a critical path analysis will be undertaken. Give **three** features of critical path analysis. **(3 marks)**

Q9) Explain how the integration of Product Data Management (PDM) and Enterprise Resource Planning (ERP) systems supports efficient manufacturing and business operations in a commercial context. **(8 marks)**



Q10) Evaluate the functionality of the Dyson Zone headphones with reference to aesthetics and user requirements within an urban lifestyle context. **(12 marks)**







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