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| Centre No. | | | | | | Paper Reference | Surname | Initial(s) |
| Candidate No. | | | | | | EG101/01 | Signature | |

Paper Reference(s)

EG101/01

Edexcel

Principal Learning

Engineering

Level 1

Unit 1: Introducing the Engineering World

Friday 16 January 2009 – Afternoon

Time: 1 hour

Examiner's use only

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| | | |
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Team Leader's use only

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| | | |
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Materials required for examination

Nil

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature. Check that you have the correct question paper.

Answer ALL the questions.

Do not use pencil. Use blue or black ink.

All of the questions must be answered with a cross in a box (☒).

If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 30 questions in this question paper. The total mark for this paper is 45.

There are 28 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

You are reminded of the importance of clear and careful presentation in your answers. You are advised to read the questions carefully.

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Answer **ALL** the questions with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

1. Civil engineers are involved with the design of:

| | | |
|----------|------------------|-------------------------------------|
| A | cars | <input checked="" type="checkbox"/> |
| B | roads | <input checked="" type="checkbox"/> |
| C | washing machines | <input checked="" type="checkbox"/> |
| D | wooden furniture | <input checked="" type="checkbox"/> |

(Total 1 mark)

Q1

2. The building of aircraft is part of which engineering sector?

| | | |
|----------|-----------|-------------------------------------|
| A | Aerospace | <input checked="" type="checkbox"/> |
| B | Chemical | <input checked="" type="checkbox"/> |
| C | Marine | <input checked="" type="checkbox"/> |
| D | Civil | <input checked="" type="checkbox"/> |

(Total 1 mark)

Q2



Leave
blank

3. Engineers working in the passenger transport industry would work on which of the following?

| | | |
|----------|-----------|-------------------------------------|
| A | Buses | <input checked="" type="checkbox"/> |
| B | Cycles | <input checked="" type="checkbox"/> |
| C | Pavements | <input checked="" type="checkbox"/> |
| D | Bridges | <input checked="" type="checkbox"/> |

Q3

(Total 1 mark)

4. Engineers who design and build bridges belong to which sector?

| | | |
|----------|------------------|-------------------------------------|
| A | Water management | <input checked="" type="checkbox"/> |
| B | Communications | <input checked="" type="checkbox"/> |
| C | Civil | <input checked="" type="checkbox"/> |
| D | Control | <input checked="" type="checkbox"/> |

Q4

(Total 1 mark)



Leave
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5. The predicted increase in the Earth's temperature caused by industrial activities is better known as:

| | | |
|----------|------------------|--------------------------|
| A | local warming | <input type="checkbox"/> |
| B | regional warming | <input type="checkbox"/> |
| C | national warming | <input type="checkbox"/> |
| D | global warming | <input type="checkbox"/> |

Q5

(Total 1 mark)

6. The term used to refer to the amount of carbon dioxide produced by someone's work activities is the:

| | | |
|----------|------------------|--------------------------|
| A | carbon stamp | <input type="checkbox"/> |
| B | carbon footprint | <input type="checkbox"/> |
| C | green footprint | <input type="checkbox"/> |
| D | green stamp | <input type="checkbox"/> |

Q6

(Total 1 mark)



Leave blank

7. Which of the following is an example of environmental legislation?

| | | |
|----------|---------------|--------------------------|
| A | Hot Air Act | <input type="checkbox"/> |
| B | Clean Air Act | <input type="checkbox"/> |
| C | Cold Air Act | <input type="checkbox"/> |
| D | Dirty Air Act | <input type="checkbox"/> |

Q7

(Total 1 mark)

8. Radioactive waste is a long-term environmental hazard because it:

| | | |
|----------|-------------------|--------------------------|
| A | remains dangerous | <input type="checkbox"/> |
| B | rots away | <input type="checkbox"/> |
| C | cools down | <input type="checkbox"/> |
| D | changes colour | <input type="checkbox"/> |

Q8

(Total 1 mark)



Leave blank

9. A manufacturing process carried out by a welder is:

| | | |
|---|-------------|--------------------------|
| A | moulding | <input type="checkbox"/> |
| B | casting | <input type="checkbox"/> |
| C | fabrication | <input type="checkbox"/> |
| D | machining | <input type="checkbox"/> |

(Total 1 mark)

Q9

10. The majority of homes in the UK are supplied with drinking water by:

| | | |
|---|-------------------|--------------------------|
| A | tanker | <input type="checkbox"/> |
| B | underground pipes | <input type="checkbox"/> |
| C | overhead cables | <input type="checkbox"/> |
| D | broadband | <input type="checkbox"/> |

(Total 1 mark)

Q10



Leave
blank

11. Which of the following activities is carried by a production operative?

| | | |
|---|---------------|--------------------------|
| A | Designing | <input type="checkbox"/> |
| B | Manufacturing | <input type="checkbox"/> |
| C | Planning | <input type="checkbox"/> |
| D | Purchasing | <input type="checkbox"/> |

Q11

(Total 1 mark)

12. Which of the following services supplied to most homes is **not** provided from a mains supply?

| | | |
|---|-------------|--------------------------|
| A | Oil | <input type="checkbox"/> |
| B | Electricity | <input type="checkbox"/> |
| C | Gas | <input type="checkbox"/> |
| D | Water | <input type="checkbox"/> |

Q12

(Total 1 mark)



H 3 5 7 4 5 A 0 7 2 8

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13. Which one of the following is **not** a fossil fuel?

| | | |
|----------|-------------|--------------------------|
| A | Coal | <input type="checkbox"/> |
| B | Crude oil | <input type="checkbox"/> |
| C | Nuclear | <input type="checkbox"/> |
| D | Natural gas | <input type="checkbox"/> |

Q13

(Total 1 mark)

14. A manufacturing process where waste is reduced is known as:

| | | |
|----------|-------------------|--------------------------|
| A | queue manufacture | <input type="checkbox"/> |
| B | clean manufacture | <input type="checkbox"/> |
| C | batch manufacture | <input type="checkbox"/> |
| D | lean manufacture | <input type="checkbox"/> |

Q14

(Total 1 mark)



15. Which of the following is an environmental benefit of using biofuels?

| | | |
|----------|---------------------|--------------------------|
| A | Lower fuel cost | <input type="checkbox"/> |
| B | Higher vehicle use | <input type="checkbox"/> |
| C | Less oil extraction | <input type="checkbox"/> |
| D | More land needed | <input type="checkbox"/> |

(Total 1 mark)

Leave blank

Q15

9

Turn over



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16. Figure 1 shows part of an energy efficiency label from a fridge.

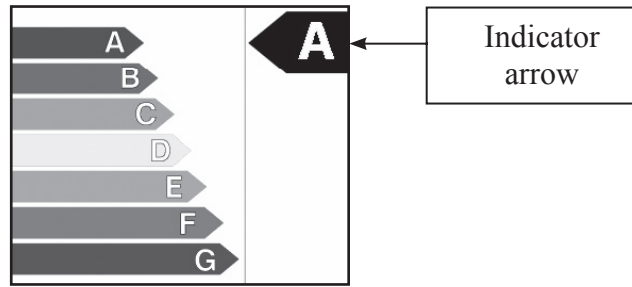


Figure 1

The indicator arrow (labelled) shows that this product is:

| | | |
|---|-----------------|--------------------------|
| A | most expensive | <input type="checkbox"/> |
| B | least efficient | <input type="checkbox"/> |
| C | most efficient | <input type="checkbox"/> |
| D | least expensive | <input type="checkbox"/> |

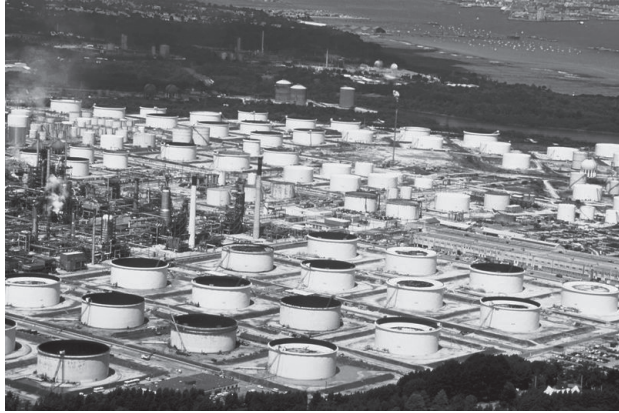
Q16

(Total 1 mark)



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17.



The picture above is of an oil refinery situated on the coast.

(a) Oil refineries are part of which industry sector?

| | | |
|----------|----------------|--------------------------|
| A | Service | <input type="checkbox"/> |
| B | Chemical | <input type="checkbox"/> |
| C | Communications | <input type="checkbox"/> |
| D | Marine | <input type="checkbox"/> |

(1)



Leave blank

(b) Oil refineries:

| | | |
|----------|--|--------------------------|
| A | process crude oil into products such as petrol | <input type="checkbox"/> |
| B | pump oil from the sea bed | <input type="checkbox"/> |
| C | manufacture oil from plants | <input type="checkbox"/> |
| D | use oil to generate other forms of energy | <input type="checkbox"/> |

(1)

(c) Bio-diesel is obtained from processing:

| | | |
|----------|---------------------|--------------------------|
| A | coal | <input type="checkbox"/> |
| B | crude oil | <input type="checkbox"/> |
| C | agricultural crops | <input type="checkbox"/> |
| D | recycled engine oil | <input type="checkbox"/> |

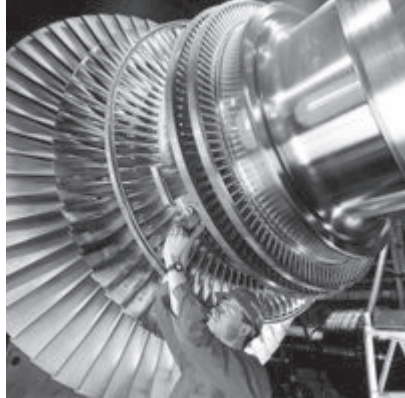
(1)

Q17

(Total 3 marks)



18.



The person above is inspecting a steam turbine.

(a) Engineers from which sector would design steam turbines?

| | | |
|----------|------------|-------------------------------------|
| A | Mechanical | <input checked="" type="checkbox"/> |
| B | Automotive | <input type="checkbox"/> |
| C | Production | <input type="checkbox"/> |
| D | Chemical | <input type="checkbox"/> |

(1)



Leave blank

(b) Staff who perform routine servicing tasks such as oil changes are classified as:

| | | |
|----------|----------------------|--------------------------|
| A | designers | <input type="checkbox"/> |
| B | construction workers | <input type="checkbox"/> |
| C | managers | <input type="checkbox"/> |
| D | maintenance staff | <input type="checkbox"/> |

(1)

(c) Steam turbines blades are made from:

| | | |
|----------|----------------|--------------------------|
| A | glass fibre | <input type="checkbox"/> |
| B | metal alloys | <input type="checkbox"/> |
| C | polymers | <input type="checkbox"/> |
| D | semiconductors | <input type="checkbox"/> |

(1)

Q18

(Total 3 marks)



Leave
blank

19. (a) Which of the following waste must **not** be put in a landfill site?

| | | |
|----------|-----------|--------------------------|
| A | Nuclear | <input type="checkbox"/> |
| B | Household | <input type="checkbox"/> |
| C | Office | <input type="checkbox"/> |
| D | Garden | <input type="checkbox"/> |

(1)

(b) Major landfill sites are often located in:

| | | |
|----------|------------------|--------------------------|
| A | shopping centres | <input type="checkbox"/> |
| B | disused quarries | <input type="checkbox"/> |
| C | public parks | <input type="checkbox"/> |
| D | housing estates | <input type="checkbox"/> |

(1)

Q19

(Total 2 marks)

15

Turn over



H 3 5 7 4 5 A 0 1 5 2 8

20. Mobile phones are used by many people everyday. In 2005, it was estimated that 15 million were discarded in the UK.

(a) Engineers from which sector design mobile phones?

| | | |
|----------|--------------|--------------------------|
| A | Marine | <input type="checkbox"/> |
| B | Agricultural | <input type="checkbox"/> |
| C | Electronic | <input type="checkbox"/> |
| D | Aeronautical | <input type="checkbox"/> |

(1)

(b) Mobile phones must be disposed of carefully because they:

| | | |
|----------|--------------------------|--------------------------|
| A | contain mercury | <input type="checkbox"/> |
| B | have a good resale value | <input type="checkbox"/> |
| C | are made out of polymers | <input type="checkbox"/> |
| D | are heavy | <input type="checkbox"/> |

(1)



Leave
blank

(c) Mobile phone signals rely on:

| | | |
|----------|------------------------------|--------------------------|
| A | underground telephone cables | <input type="checkbox"/> |
| B | cellular networks | <input type="checkbox"/> |
| C | overhead electrical cables | <input type="checkbox"/> |
| D | television aerials | <input type="checkbox"/> |

(1)

(d) Many mobile phone users replace their phones regularly because of:

| | | |
|----------|-----------------------|--------------------------|
| A | unreliable components | <input type="checkbox"/> |
| B | faulty manufacture | <input type="checkbox"/> |
| C | moving house | <input type="checkbox"/> |
| D | improved features | <input type="checkbox"/> |

(1)

Q20

(Total 4 marks)



21.



Remotely Operated Vehicles (ROV) can be used in hazardous environments.

(a) An ROV is typically operated by:

| | | |
|----------|------------------------|--------------------------|
| A | a person inside it | <input type="checkbox"/> |
| B | wind power | <input type="checkbox"/> |
| C | a person at a distance | <input type="checkbox"/> |
| D | solar energy | <input type="checkbox"/> |

(1)

(b) ROVs are used in fire-fighting because they are:

| | | |
|----------|--------------------------|--------------------------|
| A | safer | <input type="checkbox"/> |
| B | cheaper | <input type="checkbox"/> |
| C | fun to use | <input type="checkbox"/> |
| D | environmentally friendly | <input type="checkbox"/> |

(1)



Leave blank

(c) Undersea ROVs are typically controlled using:

| | | |
|----------|----------------------------|--------------------------|
| A | mobile phones | <input type="checkbox"/> |
| B | radio signals | <input type="checkbox"/> |
| C | connecting cables | <input type="checkbox"/> |
| D | global positioning systems | <input type="checkbox"/> |

(1)

(d) ROVs can also be used for:

| | | |
|----------|------------------------|--------------------------|
| A | bomb disposal | <input type="checkbox"/> |
| B | manufacturing clothes | <input type="checkbox"/> |
| C | monitoring air traffic | <input type="checkbox"/> |
| D | private transport | <input type="checkbox"/> |

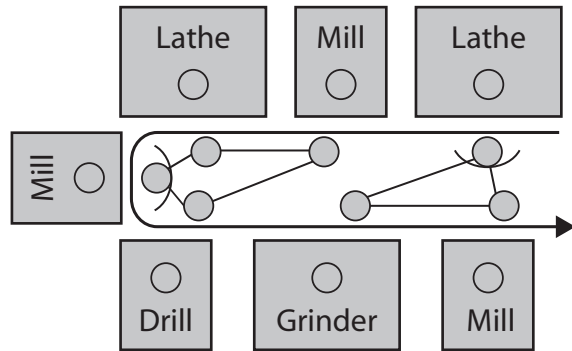
(1)

Q21

(Total 4 marks)



22.



Above is an example of a lean manufacturing cell.

(a) A feature of lean manufacturing is teamwork. A benefit of teamwork is:

| | | |
|----------|------------------------|-------------------------------------|
| A | more machines | <input checked="" type="checkbox"/> |
| B | improved communication | <input checked="" type="checkbox"/> |
| C | less training | <input checked="" type="checkbox"/> |
| D | more meetings | <input checked="" type="checkbox"/> |

(1)



Leave
blank

(b) In lean manufacturing, on the job decisions are made by the:

| | | |
|----------|-------------------|--------------------------|
| A | team | <input type="checkbox"/> |
| B | managing director | <input type="checkbox"/> |
| C | shareholders | <input type="checkbox"/> |
| D | stores person | <input type="checkbox"/> |

(1)

Q22

(Total 2 marks)

21

Turn over



23.



The picture above shows an example of a sailing boat.

(a) Boat manufacture is an example of which sector?

| | | |
|----------|--------------|--------------------------|
| A | Marine | <input type="checkbox"/> |
| B | Aerospace | <input type="checkbox"/> |
| C | Agricultural | <input type="checkbox"/> |
| D | Water | <input type="checkbox"/> |

(1)

(b) The most suitable material to make the hull of a modern sailing boat is:

| | | |
|----------|---------------------------|--------------------------|
| A | polythene sheeting | <input type="checkbox"/> |
| B | Medium Density Fibreboard | <input type="checkbox"/> |
| C | melamine laminated sheet | <input type="checkbox"/> |
| D | Glass Reinforced Plastic | <input type="checkbox"/> |

(1)



Leave
blank

(c) The sails on a boat use which form of energy?

| | | |
|----------|--------|--------------------------|
| A | Solar | <input type="checkbox"/> |
| B | Wind | <input type="checkbox"/> |
| C | Tidal | <input type="checkbox"/> |
| D | Diesel | <input type="checkbox"/> |

(1)

(d) A Global Positioning System (GPS), used on boats, receives signals from:

| | | |
|----------|-------------------|--------------------------|
| A | satellites | <input type="checkbox"/> |
| B | cellular networks | <input type="checkbox"/> |
| C | underwater cables | <input type="checkbox"/> |
| D | sonar | <input type="checkbox"/> |

(1)

Q23

(Total 4 marks)



Leave blank

24. A heating system uses a thermostat to regulate temperature in a house. It is an example of which sector of engineering?

| | | |
|----------|--------------|--------------------------|
| A | Agricultural | <input type="checkbox"/> |
| B | Civil | <input type="checkbox"/> |
| C | Control | <input type="checkbox"/> |
| D | Aerospace | <input type="checkbox"/> |

Q24

(Total 1 mark)

25. A key responsibility of a production manager is:

| | | |
|----------|---------------------|--------------------------|
| A | designing products | <input type="checkbox"/> |
| B | operating machinery | <input type="checkbox"/> |
| C | repairing equipment | <input type="checkbox"/> |
| D | meeting deadlines | <input type="checkbox"/> |

Q25

(Total 1 mark)



Leave
blank

26. In automotive engineering, car engine cylinder blocks are mass produced by:

| | | |
|----------|-------------|-------------------------------------|
| A | casting | <input checked="" type="checkbox"/> |
| B | forging | <input checked="" type="checkbox"/> |
| C | welding | <input checked="" type="checkbox"/> |
| D | fabrication | <input checked="" type="checkbox"/> |

Q26

(Total 1 mark)

27. Which one of the following would be most suitable to display initial thoughts and ideas in a problem solving meeting?

| | | |
|----------|-----------------------|-------------------------------------|
| A | Television programmes | <input checked="" type="checkbox"/> |
| B | PowerPoint | <input checked="" type="checkbox"/> |
| C | Printed posters | <input checked="" type="checkbox"/> |
| D | Flip chart | <input checked="" type="checkbox"/> |

Q27

(Total 1 mark)



Leave
blank

28. Which of the following items is **not** covered by The Waste Electrical and Electronic Equipment Regulations 2006?

| | | |
|---|--------------|--------------------------|
| A | Hairdryer | <input type="checkbox"/> |
| B | Computer | <input type="checkbox"/> |
| C | Skate board | <input type="checkbox"/> |
| D | Mobile phone | <input type="checkbox"/> |

Q28

(Total 1 mark)

29. Loft insulation is an energy efficient feature that:

| | | |
|---|-------------------------|--------------------------|
| A | warms the attic | <input type="checkbox"/> |
| B | generates heat | <input type="checkbox"/> |
| C | stops heat being wasted | <input type="checkbox"/> |
| D | uses solar energy | <input type="checkbox"/> |

Q29

(Total 1 mark)



30. Aluminium is an environmentally sustainable material because it is:

| | | |
|----------|---------------|-------------------------------------|
| A | recyclable | <input checked="" type="checkbox"/> |
| B | biodegradable | <input checked="" type="checkbox"/> |
| C | toxic | <input checked="" type="checkbox"/> |
| D | metallic | <input checked="" type="checkbox"/> |

(Total 1 mark)

TOTAL FOR PAPER: 45 MARKS

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Q30



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