

Mark Scheme (Results)

January 2013

Principal Learning

Engineering
EG301 Paper 01

Investigating Engineering Business
and the Environment

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please visit our website at www.edexcel.com.

Our website subject pages hold useful resources, support material and live feeds from our subject advisors giving you access to a portal of information. If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

www.edexcel.com/contactus

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2013

Publications Code DP034401

All the material in this publication is copyright

© Pearson Education Ltd 2013

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

SECTION A

Question Number	Answer	Mark
1	A	(1)

Question Number	Answer	Mark
2	D	(1)

Question Number	Answer	Mark
3	C	(1)

Question Number	Answer	Mark
4	C	(1)

Question Number	Answer	Mark
5	A	(1)

Question Number	Answer	Mark
6	D	(1)

Question Number	Answer	Mark
7	B	(1)

Question Number	Answer	Mark
8	C	(1)

Question Number	Answer	Mark
9	D	(1)

Question Number	Answer	Mark
10	B	(1)

Question Number	Answer	Mark
11	C	(1)

Question Number	Answer	Mark
12	A	(1)

Question Number	Answer	Mark
13	B	(1)

Question Number	Answer	Mark
14	D	(1)

Question Number	Answer	Mark
15	B	(1)

Question Number	Answer	Mark
16	A	(1)

Question Number	Answer	Mark
17	C	(1)

Question Number	Answer	Mark
18	C	(1)

Question Number	Answer	Mark
19	D	(1)

Question Number	Answer	Mark
20	B	(1)

SECTION B

Question Number	Answer	Mark
21	<p>Up to 2 marks for identification, up to 2 marks for expansion (3 marks maximum)</p> <p>Identification</p> <ul style="list-style-type: none">• A first-off (1)• A model of a final product (1)• Scale model (1)• A working model of a concept (1)• Test model (1) <p>Expansion</p> <ul style="list-style-type: none">• Used for testing/development purposes (1) against the design specification (1)• Used to gauge customer/consumer interest (1) for marketing/client needs (1)• Made to correct proportions (1) to assess final dimensions (1)• Check if it is fit for purpose (1) before beginning production (1)• Physical version of design (1) which can be used to identify flaws (1)• Allows for component parts to be trialled (1) to make sure they fit together/work (1) <p>Model answer</p> <p>A model (1) to test a design concept (1) against client requirements (1)</p>	(3)

Question Number	Answer	Mark
22	<p>An answer that makes reference to any four of the following:</p> <ul style="list-style-type: none"> • Noise levels need to be monitored (1) • Signage should be provided to warn of hazards (1) • Guidelines state at what level ear protection should be provided (1) • At 80/85dB employees should be warned of noise levels (1) • At 85/90dB warning signage/hearing protection should be provided (1) • Hand signals should be developed in very loud environments (1) • Employers should assess the risks to employees from noise at work (1) • Employers should take action/supply PPE to reduce noise exposure that produces risks (1) • Employers make sure the legal limits on noise exposure/duration are not exceeded (1) • Employees should be provide with information, instruction and training (1) • Health surveillane should be carried out where there is a risk to health/prevent damage to hearing (1) <p>Model answer (up to a maximum 4 marks) Noise levels (1) and duration (1) need to be monitored (1) to prevent damage to hearing (1) and develop other strategies (1) to use in a noisy environment (1).</p>	(4)

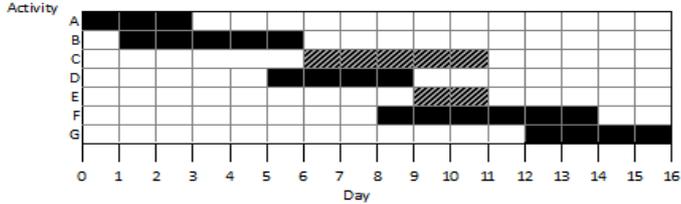
Question Number	Answer	Mark
23	<p>1 mark for each of the following (up to a max. 3 marks)</p> <ul style="list-style-type: none"> • Increased rates of employment for local population (1) • Locals have more money to spend in local shops (1) • Investment can encourage other business to locate there (1) • Investment can improve the local environment (1) • Can strengthen the local economy (1) • Provides business for other local traders (1) • Could promote investment from local authority / government (1) • Improved transport links (1) • Improved leisure facilities (1) • Factory could lower house prices (1) • Fewer/more expensive houses for locals as outsiders move in (1) • Take business from established companies (1) 	(3)

Question Number	Answer	Mark
24	<p>For full marks a method of control needs to be stated for 1 mark with a description of the control method for a second mark (x 2)</p> <ul style="list-style-type: none"> • Signage (1) to indicate what hazards are present (1) • Monitoring (1) to make sure noise/pollution levels are within allowed limits (1) • Restrict access (1) make site/area secure (1) • Fencing (1) prevents unauthorised access (1) • Safe gangways/paths (1) prevent members of the public from slipping/tripping (1) • Supply PPE (1) to reduce visitor injuries (1) • Use guides (1) to restrict visitor to safe areas (1) • Provide instructions (1) before going into workshop (1) • Carry out risk assessment before visit (1) to assess the increased risk of people unfamiliar with area (1) 	(4)

Question Number	Answer	Mark
25(a)	<p>1 mark for identification, 1 mark for expansion</p> <ul style="list-style-type: none"> • Making a strategic choice between producing an item internally (1) or buying it externally (1) • Choosing between manufacturing a product in-house (1) or purchasing it from an external supplier (1) • Deciding to purchase a product (1) rather than producing it (1) • Is it cheaper to buy/more profitable (1) than make a product (1) • Is it more advantageous to make a particular item in-house (1) or to buy it from a supplier (1) • Costing technique (1) to show most economic strategy/approach (1) 	(2)

Question Number	Answer	Mark
25(b)	<p>An answer that makes reference to any four of the following:</p> <ul style="list-style-type: none"> • A Standing Plan is used for continuing or recurring activities (1) • It can be a step-by-step guide for carrying out activities or tasks (1) • Standing Plans are used over and over again because they focus on processes that occur repeatedly (1) • These plans are not limited in time (1) • Can be adapted over time depending on changes to situations (1) • Ensures consistency in processes (1) • All staff follow the same guidance for an operation (1) • Can be adapted for similar activities (1) • Use for activities/projects not influenced by outside factors (1) <p>Max. 3 marks if does not specifically relate to an engineering project.</p> <p>Model answer (max. 4 marks) A step-by-step guide (1) used when there is recurring activities (1). It should ensure consistency in processes (1) which all staff can follow (1) which means it can be adopted for similar activities (1).</p>	(4)

SECTION C

Question Number	Answer	Mark
26(a)	 <p>1 mark for activity C (1) - <i>activity C can start any day from day 6 onwards, but must show 5 days identified</i></p> <p>1 mark for activity E. Only 1 acceptable answer (1)</p>	(2)

Question Number	Answer	Mark
26(b)	<p>1 mark for identification, up to 2 marks for expansion</p> <ul style="list-style-type: none"> • Charts can be updated (1) so that progress can be monitored (1) and changes made (1) • Charts are easy to understand (1) making it easy for staff to interpret (1) with no errors (1) • Charts can be drawn by hand (1) enabling planning to be done quickly (1) to react to changes (1) • Charts show which activities can run at the same time (1) allowing resources to be managed effectively (1) to meet deadlines (1) • Charts show the progression of the project (1) showing which activities depend on each other (1) to prioritise actions (1) • The float for an activity can be identified (1) which enables some flexibility (1) and replanning opportunities (1) • Shows the duration of activities (1) and whether they are on schedule (1) compared to estimated times (1) 	(3)

Question Number	Answer	Mark
27	<p>An answer that makes reference to any five of the following (1) and/or their relevant negative (1):</p> <ul style="list-style-type: none"> • Good service can make an occasional customer into a regular customer (1) • It is easier to keep an existing customer than gain new ones (1) • An existing client for one product may buy other products (1) • A good relationship can provide helpful feedback to the business (1) • Goods/services/payments will be received on time (1) • Good service could make clients encourage others to use the business (1) • A positive relationship can be beneficial for all parties (1) • Products can be made customised for clients (1) • A regular customer can provide a steady source of income (1) <p>Model answer (to a max. 5 marks) It is important for an engineering business to maintain good relationships with clients as it is easier to keep existing customers than gain new ones (1) as they require other products from the business (1) and recommend the business to others (1). This is done by delivering goods on time (1) and paying on time (1) which is beneficial for all parties (1).</p>	(5)

Question Number	Answer	Mark
28(a)	<p>An answer that makes reference to any four of the following:</p> <ul style="list-style-type: none"> • Ensure that all substances have the correct labelling (eg Toxic/hazardous/corrosive) (1) • Use substances in their safest form (eg pellet rather than powder) (1) • Reduce exposure to substances (1) • Make sure substances are kept safely/securely (1) • Restricted access to substances (1) • Make sure that there is adequate ventilation/extraction (1) • Reduce the chance of any spillage/leakage (1) • Make sure staff are trained to work safely with substances (1) • Provide PPE as appropriate (1) • Make sure substances are disposed of correctly (1) • Filing manufacturing data sheets (1) <p>Model answer (to a max. 4 marks) Ensure the supplier has provided appropriate data sheets (1) which can then be used to assess risks (1) and storage requirements (1). The company should also ensure it has the appropriate restrictions on access to substances (1) and the staff are trained in its safe use (1) and disposal (1).</p>	(4)

Question Number	Indicative Content	
28(b)	<p>Environmental:</p> <ul style="list-style-type: none"> • Nuclear energy has a lower carbon footprint than fossil fuels • Highly radioactive waste needs to be stored for hundreds of years • Radiation could leak into the environment • Mining/extraction/transportation/processing use fossil fuels • Nuclear power plants emit less radiation to the surrounding areas than coal-fired power plants • Small amounts of airborne radioactive gasses, are released into the environment from coal-fired power plants • Mining can contaminate local land and water resources • Lots of electricity is used for the uranium enrichment process • Nuclear plants need more water for cooling than fossil fuel plants • Failure of a nuclear power plant's cooling systems can create a nuclear meltdown • The heat from the uncontrolled reaction can melt everything it comes into contact with • Catastrophic accidents could injure or kill thousands of people <p>Economic:</p> <ul style="list-style-type: none"> • It takes at least ten years to build a nuclear power station • Takes a long time to decommission • It also costs billions to build/decommission • Nuclear power is competitive with other forms of electricity generation • Fuel costs for nuclear plants are a small proportion of total generating costs • Cost more to construct than for fossil fuel plants • Locals may move away • Reduces reliance on imported fossil fuels • Excess production can be sold abroad 	
Level	Mark	Descriptor
	0	No rewardable material
1	1-2	Simple statements which include some indication of concepts relating to one of the aspects being considered.
2	3-4	Either a detailed consideration of one of the aspects, including some key concepts or a superficial consideration of both aspects (environment and economy)
3	5-6	A detailed consideration of the major factors relating to both environment and economy. Will likely consider positive and negative aspects and include reasoned argument.

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email publication.orders@edexcel.com

Order Code DP034401 January 2013

For more information on Edexcel qualifications, please visit our website
www.edexcel.com

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual
.....



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

