

Mark Scheme (Results)

Summer 2013

Principal Learning
Engineering (EG301/01)

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SECTION A

Question Number	Answer	Mark
1	A	(1)

Question Number	Answer	Mark
2	D	(1)

Question Number	Answer	Mark
3	B	(1)

Question Number	Answer	Mark
4	D	(1)

Question Number	Answer	Mark
5	C	(1)

Question Number	Answer	Mark
6	B	(1)

Question Number	Answer	Mark
7	D	(1)

Question Number	Answer	Mark
8	A	(1)

Question Number	Answer	Mark
9	C	(1)

Question Number	Answer	Mark
10	A	(1)

Question Number	Answer	Mark
11	B	(1)

Question Number	Answer	Mark
12	D	(1)

Question Number	Answer	Mark
13	C	(1)

Question Number	Answer	Mark
14	B	(1)

Question Number	Answer	Mark
15	A	(1)

Question Number	Answer	Mark
16	B	(1)

Question Number	Answer	Mark
17	D	(1)

Question Number	Answer	Mark
18	D	(1)

Question Number	Answer	Mark
19	C	(1)

Question Number	Answer	Mark
20	B	(1)

SECTION B

Question Number	Answer	Mark
21 (a)	<p>1 mark each for any two of the following:</p> <ul style="list-style-type: none"> • PPE only protects people wearing it (1) • PPE can be easily damaged (1) • Damaged PPE will not function correctly (1) • Mobility/vision/hearing can be impaired by PPE (1) • PPE is often the wrong size for the user (1) • PPE is often worn incorrectly (1) • Often forgotten to wear (1) • PPE can be uncomfortable to wear (1) • People may think it is optional (1) • Will not prevent the risk/hazard (1) • Insecure PPE can become a hazard in its own right (1) 	(2)

Question Number	Answer	Mark
21 (b)	<p>For both marks both a hazard and risk need to be considered. Examples are valid for the award of marks</p> <p>Hazards:</p> <ul style="list-style-type: none"> • Something which could cause harm (1) • A machine/substance/activity which is dangerous (1) • An activity which has an unavoidable danger (1) • Examples could include using a lathe / soldering / climbing ladders etc (1) <p>Risks:</p> <ul style="list-style-type: none"> • How likely a hazard is to cause harm (1) • Who / what is likely to be harmed by a hazard (1) • How much harm (severity) could be caused by a hazard (1) • Examples could include entanglement / cuts / broken limbs / illness etc (1) 	(2)

Question Number	Answer	Mark
22(a)	<p>1 mark for identification, 1 mark for expansion</p> <ul style="list-style-type: none"> • A material which can be replaced (1) with minimum effect to the environment (1) • It takes the same/less time to replenish (1) as supplies are continually available 	(2)

	<p>(1)</p> <ul style="list-style-type: none"> • Will never run out (1) can always be replaced (1) • Does not need non-renewable sources to be produced (1) therefore not wasting resources (1) <p>Do not accept renew, unless qualified</p> <p>Do not award marks for specific examples, unless qualified</p>	
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Question Number	Answer	Mark
22(b)	<p>Any two:</p> <ul style="list-style-type: none"> • Geothermal (1) • Solar (1) • Wind (1) • Tidal / hydro-electric energy / wave (1) • Biodiesel / ethanol (1) • Biomass (1) • Vegetable oil / linseed oil etc (1) • Oxygen / methane / biogas / hydrogen (1) • Timber / bamboo etc (1) 	(2)

Question Number	Answer	Mark
23(a)	<p>1 mark for identification, 1 mark for expansion</p> <ul style="list-style-type: none"> • A method for allocating manufacturing cost to products (1) usually applied in continuous production (1) • Total costs are divided between the number of products made (1) to calculate an average cost per unit (1) 	(2)

Question Number	Answer	Mark
23(b)	<p>1 mark for identification, 1 mark for expansion</p> <ul style="list-style-type: none"> • Payments made (1) for a service or goods (1) • Cost generated (1) when carrying out an activity (1) • Money spent (1) when producing goods (1) • Money spent (1) on marketing or advertising etc (1) 	(2)

Question Number	Answer	Mark
24	<p>An answer that makes reference to any four of the following:</p> <ul style="list-style-type: none"> • Make sure they have experience of the type of work being done (1) • Ensure they have their own health and safety policies e.g. lone working/common working hours etc (1) • Make sure they provide method statements (1) • Make sure their recent health and safety performance/statistics are adequate/ does the subcontractor have a good reputation for safe working (1) • Make sure they have the skills and qualifications needed (1) • Make sure they will provide health and safety training/supervision (1) • What equipment should or should not be worked on/used (1) • What PPE is to be used and who will provide it (1) • How many people will be needed for the job (1) • Follow appropriate isolation procedures e.g. signage/barriers (1) <p>Model answer (to a max. 4 marks) The company would need to consider if the contractor has done that type of work before (1), what their recent safety record is (1), if they are members of a professional/trade body (1), and what their health and safety policy is (1).</p>	(4)

Question Number	Answer	Mark
25	<p>An answer that makes reference to any four of the following: (Maximum of 3 marks if only benefits OR limitations considered)</p> <p>Benefits</p> <ul style="list-style-type: none"> • Owner-manager maintains full control of their business (1) which allows them to work how they please without the interference from others (1) • Owner-managers retain all the profits of their business (1) and do not have to publish accounts like a limited company 	(4)

	<p>does (1)</p> <ul style="list-style-type: none"> • Information about the business is kept private (1) and can provide an individual service for potential customers due to close relationships (1) • Can offer a more personal service with local roots and ties (1) and are able to make decisions quickly and act on them swiftly (1) <p>Limitations</p> <ul style="list-style-type: none"> • Owner-managers are subject to unlimited liability (1) which means that if the business gets into debt, the business owner is liable (1) • An owner-manager risks their home/personal savings / assets (1) and can find it difficult to raise finance to fund their business (1) • May struggle with expansion in the future (1) due to lack of sufficient capital funds (1) • Will be unable to take advantage of economies of scale / cannot buy in bulk (1) which means they may have to charge higher prices for their services in order to cover the costs (1) • All decisions must be made by one person (1) therefore the success or failure of the business rests on one person (1) <p>Model answer (to a max. 4 marks)</p> <p>An owner manager would maintain full control of their business (1), but the business could get into debt if the decision making is poor (1). The service they provide can be tailored to the customer need (1), however they could find it difficult to finance that need (1).</p>	
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SECTION C

Question Number	Indicative Content	
26(a)	<p>Advantages</p> <ul style="list-style-type: none"> • Raises the value of sterling against other currency • May attract foreign investment • May increase demand for finished goods abroad • May give scope to invest in the financial markets • If prolonged, may increase the value of the company • Reduced price of imported raw materials • Increase the value of investments in banks <p>Disadvantages</p> <ul style="list-style-type: none"> • Reduce the value of assets • Increase the cost of repayments on loans • Customers may have less money to spend • More expensive to re-finance for projects • Employees may demand higher wage increases • Production costs increase • Lower demand from overseas customers <p>Model answer: When the Bank of England raises interest rates there is usually a rise in the value of Sterling against other currencies (1) which means that materials can be imported for lower prices (1). A disadvantage however is that interest payments on loans will increase (1) and it will be harder to get more loans for other projects (1). The public tend to have less money to spend (1) although the company could make money if they have assets which they can invest (1).</p>	
Level	Mark	Descriptor
	0	No rewardable material
1	1-2	Simple response, with little or no use of technical terms and phrases. Answer will be generic.
2	3-4	Some use of specific terms, considering both sides of the discussion.
3	5-6	Comprehensive response including good use of technical language and discussion.

Question Number	Answer	Mark
26(b)(i)	<p>Marks awarded for:</p> <ul style="list-style-type: none"> • Appropriate axes labels and values (1) • Correct plotting the intersection of the break even point (1) <p>NB: Fixed and variable cost lines do not need to be drawn to gain full marks for part (i)</p>	(2)

Question Number	Answer	Mark
26(b)(ii)	<p>Marks awarded for:</p> <ul style="list-style-type: none"> • Correct identification of fixed costs (1) • Correct identification of variable costs (1) 	(2)

Question Number	Answer	Mark
26(b)(iii)	<p>2 marks for description</p> <ul style="list-style-type: none"> • The level of sales (1) needed to cover costs (1) • The level at which a company (or business unit or product) does not make either a profit (1) or a loss (1) • Break even point is where costs (1) and revenue are equal (1) • It is the point on a break even chart 	(2)

	where total costs (1) and total revenue cross (1)	
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Question Number	Answer	Mark
27	<p>Award 1 mark for each valid point</p> <ul style="list-style-type: none"> • Preparing materials / components (1) • Setting tools / jigs (1) • Machining components / parts (1) • Converting raw materials into final products (1) • Assembly / fabrication (1) • Carrying out risk assessment (1) • Checking / testing / Quality Assurance (QA) / Quality Control (QC) (1) <p>Accept named processes Do not accept 'making things'</p>	(2)

Question Number	Indicative Content
28	<p><i>For full marks, must refer to booklets/leaflets/downloads as well as the uses/applications of these. Maximum of 4 marks if only booklets/leaflets/downloads or use/applications are discussed.</i></p> <ul style="list-style-type: none"> • Templates and frameworks • Best practice • Case studies • Benchmarking • Evidence that they've considered it • Ideas for dissemination • Training materials • Easy access from website (downloaded free of charge) • Build up a library of safety documents • Train health and safety reps • User friendly <p>Model answer: The HSE provides a wide range of information which a business can either get as booklets or download them from the HSE website (1). They are able to use case studies from accidents or incidents to find out if activities which they carry out are dangerous (1) and can use the guidance to develop routines inline with the best practice described (1) to prevent accidents. The HSE provides guidance notes and frameworks for carrying out risk assessments (1) which are user friendly and easy to follow (1). This allows the company to build up its own library of safety documents (1) for future use.</p>

Level	Mark	Descriptor
	0	No rewardable material
1	1-2	Simple statements only considering the more obvious points, little or no discussion.
2	3-4	Some use of technical language. Candidate may make some reference to examples used in industry.
3	5-6	A detailed consideration of the major factors regarding working procedures. Candidate is likely to consider both theory and practice and relate these to industrial situations.

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