

# Mark Scheme (Results)

Summer 2015

Principal Learning  
Engineering (EG301/01)

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## 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
<b>1</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>2</b>	A	<b>(1)</b>

Question Number	Answer	Mark
<b>3</b>	D	<b>(1)</b>

Question Number	Answer	Mark
<b>4</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>5</b>	A	<b>(1)</b>

Question Number	Answer	Mark
<b>6</b>	D	<b>(1)</b>

Question Number	Answer	Mark
<b>7</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>8</b>	D	<b>(1)</b>

Question Number	Answer	Mark
<b>9</b>	C	<b>(1)</b>

Question Number	Answer	Mark
<b>10</b>	D	<b>(1)</b>

Question Number	Answer	Mark
<b>11</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>12</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>13</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>14</b>	C	<b>(1)</b>

Question Number	Answer	Mark
<b>15</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>16</b>	C	<b>(1)</b>

Question Number	Answer	Mark
<b>17</b>	D	<b>(1)</b>

Question Number	Answer	Mark
<b>18</b>	B	<b>(1)</b>

Question Number	Answer	Mark
<b>19</b>	C	<b>(1)</b>

Question Number	Answer	Mark
<b>20</b>	A	<b>(1)</b>

## SECTION B

Question Number	Answer	Mark
<b>21a (i)</b>	<ul style="list-style-type: none"> <li>• Monies which directly contribute (1) towards the net income (1)</li> <li>• The amount remaining once variable costs (1) are deducted from revenue (1)</li> <li>• the amount of money gained or lost (1) from selling an additional unit of a product (1)</li> </ul>	<b>(2)</b>

Question Number	Answer	Mark
<b>21a (ii)</b>	<ul style="list-style-type: none"> <li>• costs which cannot be attributed to a single product (1), which could be fixed or variable (1)</li> <li>• costs which do not occur directly from the manufacture of the product (1) such as advertising/energy/rent (1)</li> </ul>	<b>(2)</b>

Question Number	Answer	Mark
<b>21b</b>	<p>One mark for each feature and a further mark for each expansion/comparison. Maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• Job costing is used for unique products (1), and process costing is used for standardized products (1).</li> <li>• Job costing is used for very small production runs/<b>one-offs</b> (1), and process costing is used for large production runs (1).</li> <li>• Much more record keeping is required for job costing (1), since time and materials must be charged to specific jobs (1)</li> <li>• Process costing aggregates costs (1) and so requires less record keeping (1).</li> <li>• Job costing is more likely to be used for billings to customers (1), since it details the exact costs for work commissioned by customers (1)</li> <li>• Process costing extends over a longer time (1), allowing cost estimating to be more effective (1).</li> </ul>	<b>(4)</b>

Question Number	Answer	Mark
<b>22(a)</b>	<p>1 mark for each valid item</p> <ul style="list-style-type: none"> <li>• Components required/quantity (1)</li> <li>• <b>Material requirements (1)</b></li> <li>• Tools/equipment required (1)</li> <li>• Timings (1)</li> <li>• Sequence of activities (1)</li> <li>• PPE requirements (1)</li> <li>• Staffing requirements (1)</li> <li>• Quality control checks/critical control points (1)</li> <li>• Risk assessment/health and safety issues/regulations (1)</li> <li>• Manufacturing processes/techniques (1)</li> </ul> <p><i>Accept any other reasonable response.</i></p>	<b>(2)</b>
Question Number	Answer	Mark
<b>22(b)</b>	<p>1 mark for each valid point</p> <ul style="list-style-type: none"> <li>• Allows all activities to be standardised (1)</li> <li>• States the correct sequence of activities (1)</li> <li>• Prevents mistakes (1)</li> <li>• Ensures work meets the specification/standard/<b>quality</b> required (1)</li> <li>• Procedures are established and effective (1)</li> <li>• Reduces risks of injury/accident (1)</li> <li>• Ensures nothing is forgotten (1)</li> <li>• Makes the outcomes consistent across different workers (1)</li> <li>• Can improve company reputation (1)</li> </ul> <p>Model answer It is important that employees follow standard procedures as this makes sure that the work is carried out in the correct order (1) and is done safely (1). It makes sure that the correct standard of work is achieved (1) and that nothing is forgotten (1)</p>	<b>(4)</b>

Question Number	Answer	Mark
<b>23</b>	<p>1 mark for each valid point. Maximum 2 marks.</p> <ul style="list-style-type: none"> <li>• Pull market may lead to increased demand (1)</li> <li>• Increased demand will require more staff/equipment/capacity (1)</li> <li>• Investment may be required (1)</li> <li>• Consumers may desire higher quality products (1)</li> <li>• Expectations from consumers will be reflected in selling price (1)</li> <li>• Increased expectations may make an existing product less desirable (1)</li> <li>• Demand for new products could result in obsolete stock (1)</li> <li>• Environmental expectations may require redevelopment of products (1)</li> <li>• <b>Not meeting expectations may result in a lack of sales (1)</b></li> </ul> <p><i>Accept any other reasonable response.</i></p>	<b>(2)</b>

Question Number	Answer	Mark
<b>24</b>	<p>1 mark for each point and a further mark for each expansion. Maximum 4 marks.</p> <ul style="list-style-type: none"> <li>• Allows the business to identify which parts of a plan are effective (1) and therefore need no further changes (1)</li> <li>• Monitoring can identify areas where there could be improvements (1) due to lack of efficiencies (1)</li> <li>• Ensures accurate records are kept of activities (1) which checks that all activities are being carried out (1)</li> <li>• Allows changes to be made if the plan is not running correctly (1) with results used to justify changes (1)</li> </ul> <p>Model answer</p> <p>By using monitoring, a business can identify which parts of a plan are working well (1), and those which are not (1). Changes can be made to the plan (1) and implemented to improve efficiencies (1).</p>	<b>(4)</b>



	Maximum 2 marks for low level responses.	
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### SECTION C

Question Number	Answer	Mark
<b>25</b>	<p>One mark for each feature and a further mark for each expansion/comparison. Maximum 4 marks. Must consider both pollutants and waste in order to get full marks.</p> <ul style="list-style-type: none"> <li>• Waste is generally harmless (1) but pollutants are a hazard to the environment (1)</li> <li>• Waste is the offcuts/excess materials from production/<b>unsold inventory</b> (1) whereas pollutants are harmful byproducts (1)</li> <li>• Waste can often be recycled into further products (1) but pollutants cannot easily be recycled (1)</li> <li>• Some waste is hazardous such as medical/chemical/radioactive (1) which if not processed correctly can be a pollutant (1)</li> </ul> <p><i>Accept any other reasonable response.</i></p>	<b>(4)</b>

Question Number	Answer	Mark
<b>26(a)</b>	<p>A description that makes reference to 5 valid points. 1 mark for each valid point of a lifting assessment.</p> <ul style="list-style-type: none"> <li>• Checking the weight of the load (1)</li> <li>• Check the shape/size of the load/how easy it is to hold (1)</li> <li>• Establishing the repetition rate of the lifting operation (1).</li> <li>• Determine the angle at which the upper arms are positioned relative to the body (1)</li> <li>• Identify where the load starts/ends (1)</li> <li>• See if the worker's body twists in relation to their hips/thighs (1)</li> <li>• Establish whether they lean to one side as the load is lifted(1)</li> <li>• Determine whether the work location restricts movement (1)</li> <li>• Evaluate how easy/difficult is it to hold the load (1)</li> <li>• Check the condition of the flooring (1)</li> <li>• Monitor if the work is in extremes of temperatures/lighting conditions (1)</li> </ul> <p>Model answer The lifting assessment begins with checking the weight of the load (1). Then identify where the load starts and ends (1) and whether it is easy to hold onto (1). Consideration should be given to the floor conditions (1) and the work location (1).</p>	<b>(5)</b>

Question Number	Answer	Mark
<b>26(b)</b>	<p>1 mark for each valid point up to a maximum of 5 marks.</p> <ul style="list-style-type: none"> <li>• Ensures access only to authorised persons (1)</li> <li>• Use of hazardous materials is recorded (1)</li> <li>• Authorized persons are trained in safe use of the materials (1)</li> <li>• Hazardous materials are kept securely to prevent unauthorized use (1)</li> <li>• Reduces exposure to hazards for all staff (1)</li> <li>• Secure storage prevents accidental contamination of work areas (1)</li> <li>• Reduces the likelihood of workplace injuries/illnesses/<b>accidents</b> (1)</li> </ul> <p>Model answer:  <i>Substance control reduces the exposure to harmful materials for employees (1) because only those staff who are trained to use the materials safely (1) can have access to these materials (1). When not in use, they should be locked in a cupboard (1) to try to prevent any accidents (1) or unauthorised use.</i></p>	<b>(5)</b>

Question Number		Indicative Content
<b>27</b>		<ul style="list-style-type: none"> <li>• Skilled staff are already employed in the area</li> <li>• Competition for staff may increase wages</li> <li>• Reduces need to train staff</li> <li>• Too many competing companies may lead to a shortage of staff</li> <li>• Local suppliers will be aware of the expected standard of resources</li> <li>• It may be possible to jointly invest with existing companies</li> <li>• There may be grants/tax breaks available to locate in other areas</li> <li>• Can the local infrastructure sustain further similar companies</li> <li>• Is there the potential for the company to expand</li> <li>• Reputation of existing companies may influence the market</li> <li>• Ability to sub-contract work to existing companies</li> </ul>
Level	Mark	Descriptor
	<b>0</b>	No rewardable material
<b>1</b>	<b>1-2</b>	Learner identifies limited considerations with no development OR identifies and develops one consideration. Shows limited understanding of the factors which may influence decisions.
<b>2</b>	<b>3-4</b>	Learner identifies some considerations with associated developments showing some understanding of the reasons. The learner uses some technological terms and shows some focus and structure, beginning to form a balanced view.
<b>3</b>	<b>5-6</b>	Learner identifies a range of considerations with associated developments showing a detailed understanding of the issues, including those associated with the conflict between benefits and disadvantages. The learner uses a range of appropriate technological terms and shows good focus and structure.