Moderator's Report
Principal Moderator Feedback

Summer 2017

Pearson Edexcel GCE
In Engineering (6933)
Paper 01: Principles of Design, Planning
And Prototyping

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. 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

Summer 2017
Publications Code 6933_01_1706_ER

General comments

For this unit: Principles of design, planning and prototyping, candidates are required to produce a single design and make task using titles from those published by Edexcel, or by generating their own. They must produce evidence of a solution to their selected problem in a design folder of engineering, drawings,technical specification writing, designing and developing a solution to the selected task, planning for production, manufacturing and giving an oral presentation to peers. A design folder must be submitted for moderation, which must include photographic evidence of what has been manufactured.

All work submitted by candidates was potentially appropriate to the requirements of this course offering access to the full range of marks available, but standards ranged from excellent to those that were only just worthy of AS levels of response.

Some interesting work was undertaken, with barbecues and drill holders being popular choices. There was limited use of electronic circuitry, and where this was in evidence, circuits were simplistic and taken from technical sources without modification. PIC programming was used, but there was little evidence of a true understanding of the PIC circuitry being programmed.

Where design work included the use of mechanisms, candidates missed opportunities to explored alternative ways of producing output motions from different inputs, which would have enhanced design sections.
A continuing problem is that when designing, candidates fail to explore a range of ideas in any detail, probably because they have already decided on a design proposal and any other designs are treated as superficial images to target marks.

Designs were rarely developed through further design input, which usually consisted of construction details and working drawings of an initial idea. Most candidates modelled designs, but most also failed to justify what aspects of designs were being tested. There should always be a reason for modelling beyond cosmetically looking at how the final outcome might appear.

Assessment criterion (a)

Marks in this section were awarded leniently in most cases, where candidates presented automatically generated engineering drawings from 3D CAD sketches. A few candidates produces hand drawn engineering drawings, but in general these lacked precision and the use of drawing conventions was limited.
The point of this section is to teach candidates how to produce and understand engineering drawings. It is expected that candidates will demonstrate formal drawing skills using hand techniques, or through the use of a 2D CAD drawing package, where drawing tools are used to produce technical drawings laid out appropriately. Generating orthographic views

from a 3D CAD sketch develops no understanding of layout or drawing conventions and standards.

Assessment criterion (b)

The majority of candidates produced high quality production plans, which included appropriate sequences of manufacturing tasks, including projected times and deadlines. Many candidates presented copious amounts of planning pages, which was unnecessary as they would have gained their marks for less work, as long as it demonstrated an ability to plan for manufacturing appropriately. A minority of candidates recorded units of time in days, weeks or lessons without qualifying how long these units of time were.

The best work seen in this section detailed tasks and sub-tasks and gave projected timings in hours and/or minutes. It is not expected that candidates should be able to predict accurately how long a task will take, but they should be aware that some processes and tasks will take longer than others to carry out.

The quality of specification writing varied considerably. Better examples of specifications contained statements that were technical, measurable and justified; statements that could be used to check the viability of designs in progress and to evaluate the final practical outcome. Some specification statements were superficial, vague and non-specific and lacked quantitative information that could be used to guide designing.

Assessment criterion (c)

As has always been the case, this assessment section was problematic once again for many candidates. Some high quality, detailed work was seen, but this was in the minority. Although candidates generated ideas, these were often limited in details of design sub-systems. It is not enough to annotate a sketch to point out that a component part moves, rotates or adjusts; candidates need to demonstrate graphically how such design features would operate. This is particularly apposite to this course, where mechanical details are important.

Alternative design solutions were often simplistic and were sometimes no more than shapes presented to meet an assessment requirement. On some occasions it appeared that candidates had already decided what they were going to make and were producing alternative designs because it was an assessment requirement. Candidates hardly ever referred to specification points to check the viability of ongoing designs, which was disappointing as the point of producing a specification is to guide designing.

Development of designs was generally weak and few candidates were able to show how initial designs had been refined and developed into a final design proposal. There was often little or no evaluation of the final proposed design to check its viability or fitness for purpose.

Where electronic design ideas were presented it was rare to see alternative circuit designs being considered. Many candidates used ‘found’ circuits without making any attempt at development or modification. It is not expected that candidates should design circuits from first principles, but it is expected that electronic design solutions should be built using established

electronic building blocks in creative ways to explore alternative ways of producing the desired performance for their intended product.

Assessment criterion (d)

Most practical work was complete and functioning and some very high quality outcomes were presented, demonstrating a range of challenging processes and high level skills. However a few candidates were over-rewarding for poor quality work that was of low demand. A small minority of products, despite being well made, scored low marks because they were simplistic and did not meet the expected levels of response for this course. Where CAM was in evidence, it was usually not over-used, allowing candidates to demonstrate other engineering skills and processes, giving access to the high mark band.
Most marks awarded by centre assessors were agreed, but in a small minority of instances high marks were awarded where there was an over-reliance on CAM. In order to achieve high marks candidates must demonstrate high-level manufacturing skills, attention to detail and precision in their work, which cannot be done if their skills input is limited to the simple assembly of component parts that have been manufactured by computer controlled machinery.
Despite submitting photographic images of practical work, this sometimes consisted of vague or small images which made it difficult to see the detail necessary to show the complexity of task and the higher-order skills necessary to gain high marks. A few candidates failed to include any images of the fully assembled, completed product, which made it difficult to agree high marks, as a product must be fully functioning and finished to access the high marks band

Assessment criterion (e)

In this section marks were noaccepted based on teacher witness statements and the provision of some form of evidence of candidate presentations, such as photographs or hard copies of presentation slides.

Administration

Administration tasks were generally well carried out and accurate. A few teacher assessors failed to include annotation or page numbers to guide the moderator to assessment evidence, and a minimal number of addition errors were discovered.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom