EMTA Awards Limited

Founded 1858

British Horological Institute

Examiner's Report, May 2010

Certificate in Clock and Watch Servicing

Unit 1 : Technician Grade : The Theory of Clock and Watch Servicing

Twenty six candidates submitted scripts for assessment. They were required to answer four long questions, one from each of Sections A, B, C, D, and the twenty 'short answer' questions in Section E. General standards of knowledge were quite high, with several candidates achieving maximum scores for some questions. A number of candidates clearly had difficulty making accurate sketches. Candidates should note the importance of reading instructions carefully – in a small number of instances the answer given did not relate to the question.

Section A: Clocks and Clock Servicing

Q1. Train Count, Pendulum, Barrel Assembly. Candidates should give full attention to the number of decimal places actually requested in the question and units of measurement, marks are awarded for these. Several candidates named barrel assembly components correctly but then forgot to include a description.

Q2. Pivots, Bushing. Some candidates had difficulty in differentiating the three sub-sections of this question. Many sketches were poorly executed, suggesting a lack of practice. Some candidates appear to have relied on bushing tools with little practice in using hand broaches.

Section B: Watches and Watch Servicing

Q3. Quartz Watch Movement. Several candidates were unable to describe quartz watch components. Few candidates showed a good understanding of the battery end of life function and a small number of candidates were not familiar with the procedure for cleaning a stepping rotor.

Q4. Motion Work, Keyless Work. Whilst most candidates showed a good understanding of motion work, supporting sketches were poorly executed, and in several cases, the relationship between the various components was incorrect – the mechanism as drawn would not possibly have worked. A number of alternative names for keyless components were used, mostly correct.

Section C: Escapements

Q5. Jewelled Lever Escapement. Many of the sketches were poorly executed, lacked clarity and accuracy; this again showed a lack of practice. The function of the regulator on the balance cock was not well explained. The safety action was well understood but supporting sketches were poor.

Q6. Recoil Anchor Escapement. Some candidates had difficulty differentiating between sections b) and c) relating to 'drop'. Diagrams again were poorly executed.

Section D: Workshop Processes.

Q7. Tools. Nearly all candidates attempted this question. It is important to understand the difference between a 'centre punch', and a 'dot' punch; few candidates understood the difference in use between a hacksaw and a piercing saw. Several candidates also spent time describing the appearance and construction, contrary to requirements. There was generally a poor understanding of broaches.

Q8. Watchmakers Lathe. Very few candidates attempted this question, which suggests a lack of experience or practice at lathe work.

Section E: Short Answers.

Most candidates attempted nearly all of the questions with variable results. Few candidates knew the correct voltage of a silver oxide watch battery, or what 'circular error' is. It was clear also that very few candidates had experience of silver soldering.

Summary

The key feature of this paper was the generally poor standard of sketches and drawings, clear diagrams contribute to a complete answer. The relationship between components was inaccurate, relative size and proportions were poor, and overall clarity was lacking. With very few exceptions, the standard of written answers, and corresponding level of understanding by the candidates was good. Although many candidates attempted the 'tools' question, knowledge about their practical use was limited.

Unit 2 : Technician Grade : Basic Practical Workshop Processes

Candidates were required to make a Post, Collet & Rack Tail Assembly, as would be found in a longcase clock. A range of skills is necessary to complete the piece, including turning brass and steel, bluing steel, cutting a screw thread, flush riveting, filing a square and polishing flat and turned surfaces. The assessment is based on three categories - Dimensional Accuracy, Quality of Workmanship and Quality of Finish.

Twenty-Four candidates submitted pieces for assessment. Whilst it is clear that candidates had worked hard to produce pieces that are generally of a higher standard than in previous years, a great deal of the time available had been spent on accuracy, to the detriment of workmanship and finish.

ACCURACY:

Highest marks were scored on this section, but some candidates clearly experienced difficulty with the post length and collet height due to making errors or lacking confidence when determining the riveting allowance. The thickness of the square did not appear to cause many problems but marks were lost in some cases because the sides of the square were not parallel, or uniform. There were several instances where the tail pin was distorted.

QUALITY OF WORKMANSHIP:

Overall the standard of workmanship was generally good, but marks were lost because of a lack of attention to detail. Key points were the quality of the thread, not cutting the thread all the way to the shoulder with the square and poor matching of the square on the collet to the hole cut in the tail. There were also several cases where the orientation of the rack tail itself, or the tail pin, did not match the drawing, which suggests some candidates had difficulty reading the drawing correctly.

QUALITY OF FINISH:

This is the section where most candidates were weakest. Many candidates lost marks because edges and corners were rounded and many left file marks on the post square. Few candidates attempted to remove blemishes or reduce file marks prior to polishing. Bluing the post also seems to have caused some difficulty. Simple techniques, such as the use of filing buttons and stoning filed surfaces prior to polishing, would have made a significant improvement. Further training on the interpretation of technical drawings would also have been beneficial.

Unit 3 : Technician Grade : Technical Drawing

The thirteen candidates produced a drawing of a "Centre Arbor Assembly", including centre wheel and pinion, minute wheel and pipe, minute spring, minute hand and hand collet. Three views were required; front and side elevations and a sectional view from above. Ten dimensions were required in total, together with a title block. Eight drawings were drawn manually and five using CAD. All the CAD drawings were of an acceptable standard and achieved either a pass or pass-with-merit; five of the manual drawings did not reach the standard required for a pass.

Most candidates were familiar with either first of third angle projection and the views were correctly placed and suitably spaced. In a few cases the views were not well centred on the paper and some candidates did not draw all three views.

The standard of lettering was generally poor on the manual drawings and candidates are reminded that it is acceptable to use a lettering stencil to improve quality. Border, title, scale, units and projection symbol were correctly included in nearly all cases.

In most drawings, the quality and nature of lines was not of a high standard. There was often no, or insufficient, difference in weight between thick and thin lines in both manual and CAD drawings and centre and hidden detail lines were often missing or incorrectly proportioned.

When components are drawn assembled, screw threads will naturally be hidden and need to be drawn as hidden detail; only two candidates were able to do so correctly.

The correct conventions for labelling the sectional view and cutting plane were not well known and only three candidates did this correctly. Most knew not to section the arbor, but candidates should be aware that the other components fitted to the arbor; i.e. centre wheel and collet, minute wheel and pipe, minute spring, hand and hand collet should all be sectioned. When hatching small areas, the recommended 4mm spacing should be reduced to suit.

Only a small number of candidates were familiar with conventions for drawing gears; often pitch circles and pitch lines were not drawn as "chain lines" and / or did not extend beyond the thickness of the gear. Gears were often not hatched in the sectional view.

Most included ten dimensions, as requested but three had no dimensions at all. The correct conventions were known and applied. Arrowheads were often not the recommended size and shape, but were filled as convention dictates.

The pictorial view which was provided was correctly interpreted in most cases with no major misunderstandings. Features shown that were commonly omitted or drawn wrongly were the chamfer on the rear of the arbor and the rounded end of the back pivot; both a straight and a curved line are required to show the rounded end correctly.

Unit 4 : Technician Grade : Practical Clock / Watch Servicing

Nine Records of Repairs were assessed. Six were fully satisfactory with documented evidence of the correct number of movements and repair processes and fully signed by both candidates and assessors. Three had to be returned for completion because:

1. Two processes had been carried out as additional exercises but no documentation for these was included.
2. Some processes were not carried out the required number of times.
3. The candidate handed in forms that had not been signed by the assessor.

Each Record of Repairs is checked thoroughly by the Examiners; delays could be prevented if the candidate ensured the documentation was correct before submitting the Record of Repairs.

The Examiners exercise considerable care to ensure that there can be no error in the final mark awarded. If, however, you believe that a mistake has occurred then you may request that your paper be assessed again. The charge for remarking is £40.00 per unit, which must accompany the request. This should be received on or before 31st August 2010. The fee will be returned if it is found that as a result of the appeal process the outcome of the examination (i.e. Pass / Fail or Pass / Pass with Merit) is changed.