External Assessment Report 2010

Subject	**Physics**
Level	**Standard Grade**

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the Examination.

Comments on candidate performance

General comments

Most Markers and Examiners thought that the examination was fair and balanced, and tested an extensive range of Outcomes from the Arrangements for Standard Grade Physics at both General and Credit levels.

Comment was also favourable regarding the spread of Outcomes testing the different units of coursework, in both General and Credit examinations.

The General and Credit level examinations included the customary variety of types of questions designed to assess the achievement of the Course Objectives.

These included multiple-choice questions (at General level), numerical direct-answer and short-answer questions and extended-answer questions at both General and Credit levels.

Many Markers commented that all questions were accessible to well prepared candidates. Also, the performance and responses of most candidates to questions from all of the Units of the Course seemed to be balanced.

At both General and Credit level, candidates appeared to have had sufficient time to complete the examination, with no evidence of rushing to finish.

Again, several Markers commented on the maintained improvement, by most candidates, in the selection of the appropriate relationship for numerical questions since the introduction of the Physics Data Booklet. However, although most candidates did seem to be well prepared for the examination, there was some evidence of some candidates not having applied sufficient effort to retain knowledge and facts, and not to have sufficiently practised their problem solving skills.

As in previous years, there were common, careless mistakes or omissions in responses which have been consistently highlighted in these reports (eg missing or wrong unit in the final answer to numerical problems).

For questions requiring explanations or descriptions, most candidates were able to express their answers clearly and precisely. Their correct use of appropriate terms and ‘physics language’ were of the required standard to gain full or partial credit for the question.

Some candidates, however, were unable to give explanations which were clear and unambiguous, or the explanations were too loose, or gave additional contradictory information, which led to marks for the answer being withheld.

Areas in which candidates performed well

General level:

Q7 (a) Analysis of the $d = vt$ relationship

Q7 (b) Apply knowledge to correctly select and position data

Q7 (c) Complete diagram to show the path of transmitted signals

Q8 (a) (i) Current in *series* circuits

Q8 (b) (ii), (iii) Calculation of power, identification of useful energy transfer

Q11 (a) Handling data about digital X-ray imaging

Q12 (b) (ii) Calculation of current in circuit

Q14 (c) Calculation of average speed

Q15 (b) Calculation of work done

Q15 (c) (ii) Justification of weight limit

Q18 (c) Ordering of astronomical distances

Credit level:

Q1 (a), (b), (c) Data retrieval from Data Sheet, calculations and analysis of ultrasound waves

Q5 (b) (i) Identification of eye defect

Q6 (a) (ii) Identification of ionising radiation

Q8 (a) (i) Identification of output device

Q8 (c) (i) Identification of truth table

Q10 (a) (i) Extraction of data from graph

Q13 (b) (i) Calculation of gravitational field strength

Q14 (b) Completion of table by inserting colours/wavelength of light

Q14 (c) (i) Analysis of table to provide value for period of Jupiter

Areas which candidates found demanding

General:

Q8 (b) (i) Identifying voltage across and current through lamps connected in parallel

Q9 (a) (ii) Explanation of direct current

Q10 (c) (ii) Example of use of ultrasound in medicine

Q12 (a) (ii) Drawing of transistor symbol

Q14 (a) Identification of balanced forces

Q19 (a) (i) Description of reaction force

Q19 (c) (i) Description of force on orbiting spacecraft

Credit level:

Q2 (a) Comparison of wavelength of tv/radio waves and their relative diffraction

Q3 (e) (i), (ii) Analysis of removal of lamp in parallel circuit and the effect on total current

Q4 (a) (i) Purpose of fuse

Q4 (b) (i), (ii) Reasons for use of field coils and multi-section commutator in a commercial motor

Q6 (a) (i) State the meaning of term ionisation

Q6 (c) (ii) State two factors concerning biological effect of radiation on living material

Q7 (a) Calculation of voltage using voltage divider relationship

Q8 (b) Explanation, using forces, of the reason for use of seat belts in cars

Q8 (c) (ii) Drawing of OR gate symbol

Q10 (a) (ii) Calculation of distance travelled from speed/time graph

Q12 (a) (ii) Data retrieval from Data Sheet, calculation of mass using $E_h = cm\Delta T$

Q12 (a) (iii) Explanation/reasons for actual mass being less than calculated mass

Q12 (b) (ii) Data retrieval from Data Sheet, calculation of mass using $E_h = ml$

Q13 (a) Meaning of gravitational field strength

Q13 (c) (i) Calculation of vertical speed of hammer

Advice to centres for preparation of future candidates

Centres and candidates are reminded that all of the Outcomes in the Standard Grade Arrangements in Physics document may be tested in the examination, and that candidates should be encouraged to consolidate their knowledge and problem solving skills for the entire Course.

To encourage familiarity with the required relationships, candidates' preparation for the examinations should include repeated, routine use of the Physics Data Booklet and the Data Sheet from the Credit level examination paper when solving problems.

When practising questions which require explanations or descriptions to be given, candidates should be encouraged to use language at an appropriate level to illustrate their understanding of the question.

Allowing candidates to refer to the Outcomes, the External Assessment Report and the Marking Instructions for past papers would assist with the identification of appropriate terminology.

Candidates should have the opportunity to practise questions such as numerical direct-answer and short-answer questions and extended-answer questions at both General and Credit levels.

This would help to reduce common mistakes.

Emphasis on questions relating to coursework which candidates traditionally find demanding would help to improve their understanding and familiarity with the examination content.

For example:

- Regular use of the Physics Data Booklet in the routine selection of relationships required to solve problems.
- Practice of a variety of questions requiring conversion of units.
- Practice of questions requiring symbols to be drawn.
- The use of the Data Sheet to identify and extract information required to obtain answers to extended questions.
- The use of extended questions from, eg past papers, to develop candidates' ability to supply the range of answers required; and to indicate the pace required during an examination.

Statistical information: update on Courses

Number of resulted entries in 2009	14780
Number of resulted entries in 2010	14571

Statistical information: performance of candidates

Distribution of overall awards

Grade 1	33.6%
Grade 2	25.0%
Grade 3	21.2%
Grade 4	7.6%
Grade 5	5.6%
Grade 6	5.8%
Grade 7	0.4%
No award	0.9%

Grade boundaries for each assessable element in the subject included in the report

Assessable Element	**Credit Max Mark**	**Grade Boundaries**		**General Max Mark**	**Grade Boundaries**		**Foundation Max Mark**	**Grade Boundaries**	
		1	**2**		**3**	**4**		**5**	**6**
KU	50	35	25	40	25	19	40	16	n/a
PS	50	36	25	40	22	18	40	15	n/a