External Assessment Report 2009

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 that it tested a wide range of Learning Outcomes from the Arrangements for Standard Grade Physics at both general and credit levels.
There was no evidence of lack of time.
All questions were accessible to well prepared candidates. The performance of most candidates in all of the units of the course was balanced.

Most candidates were well prepared for the examination and were able to attempt answers to all questions. However, there were some notable areas where some candidates did not seem to be well prepared in their knowledge and understanding of some of the Learning Outcomes described in the Arrangements. This lack of preparation was also reflected in the problem solving performance of some candidates at both general and credit levels.

Markers and examiners noted a maintained improvement in the selection of the appropriate relationship for numerical questions since the introduction of the Physics Data Booklet. However, where candidates were able to select and use the correct relationship to answer a question, some were unable to complete the answer because they gave the wrong unit or even omitted the unit in the final answer (at both levels), or, at credit level, because they gave an inappropriate number of significant figures in the final answer.

Centres and candidates are reminded that *all* of the Learning Outcomes in the Arrangements can be routinely tested in the external examination.

Conversion into appropriate units was a problem for some candidates e.g. GHz→Hz, km→m, mW→W, kΩ→Ω.

Areas in which candidates performed well

General Level:

Most candidates were successful in questions which involved selecting the appropriate relationship and calculating the final answer.
Examples include:

Q10(a), (b) calculation of resistance and voltage
Q12(a)(ii) calculation of wavelength
Q15(b)(ii) calculation of acceleration

Most questions requiring the interpretation or completion of graphical information were well attempted.
Examples include:

Q13(b)(i),(ii) select digital signal, draw amplified signal
Q15(b)(i) complete a speed-time graph

Credit Level:

The performance of most candidates in questions testing their knowledge and understanding was good.
As was the case at general level, candidates were mostly successful in the correct selection of relationship required to complete an answer requiring a calculation.

Examples include:

Q1(a)(ii) wavelength of signal
Q1(b) time for signal to travel
Q2(c) calculate depth of sea bed – although some candidates failed to divide answer by two
Q3(c) calculation of output power
Q8(c)(ii) calculation of resistance
Q10(b)(i) calculation of weight
Q11(a) calculation of acceleration
Q11((b) calculation of gravitational potential energy
Q12(b)(i) calculation of total distance travelled
Q12(b)(ii) calculation of average speed
Q14(b) calculation of heat energy
Q14(c)(ii) calculation of time to supply heat energy

Areas which candidates found demanding

General Level:

A significant number of candidates failed to demonstrate knowledge of the basic facts required to complete some answers.
Examples include:

Q5 selection of digital device.
Q9(c)(i),(ii) knowledge about mains supply – several d.c. instead of a.c and 60 Hz instead of 50 Hz
Q10(d)(i)A&B location of energy transformation
Q16(a) minimum required upward force

Some questions which required descriptive or explanatory responses were poorly attempted by some candidates. Responses were loose or imprecise, indicating a lack of preparation for these types of questions.
Examples include:

Q7(c)(ii) purpose of a tuner.
Q10(c)(i) describe how to show that continuity tester is working
Q11(b) some loose descriptions-'to see broken bones'
Q11(c)(i) explain use of gamma radiation
Q14(c)(ii) explain the need for a series resistor

A few candidates were careless in their answers to graphical questions.
Examples include:

Q8(b) some candidates failed to show frequency being *doubled* clearly

Credit Level:

Some candidates found some problem solving marks quite difficult to attain, particularly in extended questions worth three marks. This was usually caused by a failure to do a preliminary calculation before applying a relationship, or by failing to seek necessary data from the Data Sheet.
Examples include:

Q10(b(ii) calculation of acceleration –some candidates failed to calculate the unbalanced force first
Q13(c) calculation of power loss – some candidates failed to calculate the total resistance of the cable
Q14(c)(i) calculation of latent heat energy – some candidates failed to obtain the value for l_f from the Data Sheet

As previously stated, there were areas where some candidates did not seem to be well prepared in their knowledge and understanding of some of the Learning Outcomes described in the Arrangements. Examples include:

Q4(b)(i)   purpose of commutator
Q4(c)(ii)   how to reverse direction of rotation.
Q6(b)   what is meant by refraction of light
Q8(b)   reduce time for LED to switch on – ambiguous answers used (smaller resistor/capacitor instead of smaller values of resistance/capacitance)
Q11(b)(ii)   some candidates failed to apply conservation of energy
Q15(c)   explanation of circular path/orbit

Advice to centres for preparation of future candidates

Centres and candidates are reminded that any of the Learning Outcomes in the Standard Grade Arrangements in Physics document may be tested in the examination.
Candidates should be encouraged to consolidate their knowledge and skills for the entire course, e.g. by practising questions from past papers.

Candidates' preparation for the examination could include repeated use of the Physics Data Booklet and the Data Sheet from the credit examination paper, when solving problems.

To help to reduce common mistakes, placing a particular emphasis on rehearsing the traditional areas which candidates find demanding would help improve their understanding and familiarity with the examination content.
For example:

- Use of the Data Booklet in the routine selection of relationships required to solve problems.
- Use of a variety of questions requiring conversion of units,
- The use of the Data Sheet to extract information required to obtain answers to extended questions.
- The use of 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 2008	15296

Number of resulted entries in 2009	14780

Statistical Information: Performance of candidates

Distribution of overall awards

Grade 1	29.8%
Grade 2	26.0%
Grade 3	24.6%
Grade 4	8.5%
Grade 5	5.7%
Grade 6	4.1%
Grade 7	0.3%
No award	1.0%

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**	34	25	**40**	24	18	**40**	15	n/a
PS	**50**	32	22	**40**	24	20	**40**	17	n/a