

Accelerator short option (S19)

Examiners' report

Trinity 2009

	Q1	Q2	Q3
Papers	11	8	5
Highest mark	25	23	19
Lowest mark	10	11	17
Average	19.4	16.9	18.2
RMS	4.5	3.8	1.1

1 Problem 1

- a) The first part of the question about electrons was answered well. The second part, dealing with the production of protons was not so well understood. Some student misunderstood the concept of spallation which uses protons to produce neutrons (and not the other way round).
- b) Answers to this question were generally satisfactory.
- c) Most students did not link this question with the previous one and did not realise that the emission of synchrotron radiation occurs mostly in the horizontal plane, leading to a much smaller vertical beam size.
- d) The first part of this question was done with ease whereas the second part which used the same formula was not so well understood.

2 Problem 2

- a) This part was generally well answered.
- b) Students has no difficulties with this part.
- c) Surprisingly, most students found this question difficult despite the relevant formula being given at the top of the exam. The last part of the question was much better answered.
- d) Many good answers to this question.
- e) The definition of emittance is well understood but the devices needed to measure it are not so well understood.

- f) The distance required to reach 920 GeV was usually found correctly but not the total power needed (despite being a simple formula plugging exercise)!

3 Problem 3

- a) nobody stated that bending magnets are dipoles, few understood effect of sextupole
- b) The question was asked in mm mrad not mm rad! Otherwise the question was well answered
- c) Setup of matrix multiplication usually correct. Very few correct numerical solutions however.
- d) Well answered question
- e) Many answers did not include the absence of vertical effects. Otherwise well answered question

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