If it is not listed here it is not on the syllabus.

B Paper 2010

Q1. On Syllabus. End of part d is tricky and was not really covered, but could be deduced by a perceptive student.

Q2. On Syllabus. The [7] point part is tricky

Q3. On Syllabus.

Q4. On Syllabus

Q5. On syllabus.

Q6. The first two parts are mostly on syllabus, although we covered them only very briefly. The final part about constructing a laser is certainly not. The students should be able to deduce the density of states of a 2d electron gas. Figuring out how the multiple states in a quantum well change this density of states would require some thinking and was not covered (but clever students might get it).

Q7,8 Not on syllabus

B Paper 2009.

Q1. On syllabus. This question is solved in great detail in my lecture notes (note also there is an error in the height of data point e of the plot. Discussed in my lecture notes page 136)

Q2. On syllabus.

Q3. On syllabus.

Q4. On syllabus. We did not explicitly discuss part (c) but a clever student should be able to figure it out.

Q5. Not on syllabus

Q6. As with Q6 of 2010, this is mostly on syllabus except the last part discussing lasers. The students should be able to derive the density of states in 1d. Again, figuring out how the multiple states in a quantum well change this density of states would require some thinking and was not covered (but clever students might get it).

Q7,8 Not on syllabus

B Paper 2008

Q1. On syllabus.

Q2. On syllabus.

Q3. On syllabus

Q4. On syllabus (this was assigned as a homework problem)

Q5. On syllabus – Except the piece about superconductors.

Q6,7 Not on syllabus

Q8. As with Q6 of 2010, 2009, this is mostly on syllabus except the last part discussing lasers. The students should be able to derive the density of states in 2d. Again, figuring out how the multiple states in a quantum well change this density of states would require some thinking and was not covered (but clever students might get it).

B Paper 2007

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus

Q4. On syllabus – I did not use the word "exchange interaction" in this particular sense in lecture (in fact it was used in a somewhat different sense in lecture). So this might confuse the students. However, the use of "Exchange" in this sense is discussed in the lecture notes.

Q5, 6 Not on syllabus

Q7. See above comment on Q6 2010, Q6 2009, and Q8 2008. Clever students should be able to deduce the results for the first two parts. The last part about lasers is not on syllabus.

B Paper 2006

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus (this problem was assigned for homework)

Q4. On syllabus

Q5,6 Not on syllabus

Q7. Only the first part is really on syllabus. (Although there was a homework problem discussing the second part, I don't expect any but the best students would get that. The third part even fewer would get)

Q8 Not on Syllabus

B Paper 2005

Q1. Part (a) is off syllabus. Part b is on syllabus. Part d and e are on syllabus. Part c –very good students might get this, but we restricted our attention to cubic structures when discussing diffraction.

Q2. On syllabus. We discussed the last part in lecture (which according to the examiner report was not successfully answered by any student).

Q3. On syllabus.

Q4. On syllabus. The first half was assigned as a homework problem. Note there is a typo in the formula given in brackets at the end.

Q5. On syllabus. Note that the problem is incorrectly phrased. $<\sigma>$ should be replaced by $<|\sigma|>$ in the formula (since it is +1 on half the sites and -1 on the other half, $<\sigma>$ is always zero).

Q6-8 Not on syllabus

B Paper 2004

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus

Q4. On syllabus. See above comment on Q4, 2007 regarding the use of the word “exchange interaction”.

Q5-8 Not on syllabus

THE OLDER SYLLABUS

A4 2003

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus. Last part about electron-electron is not entirely on syllabus (but might be able to say something about it)

Q4. On syllabus

Q5. On syllabus

Q6. Quenching is not likely to be examined. Hund’s rule is certainly not examinable (that is the last part). The rest about paramagnetism is on syllabus, last part was only touched very very briefly in lecture.

Q7. Not on syllabus

Q8. On syllabus except (e)

A4. 2002

Q1. On syllabus except last part about superconductivity.

Q2. On syllabus except in the first part we did not discuss what m should be (Use 12)

Q3. On syllabus

Q4. On syllabus

Q5. On syllabus

Q6. On syllabus

Q7. Only first part is on syllabus.

Q8. Mostly not on syllabus

A4. 2001

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus

Q4. On syllabus

Q5. On syllabus

Q6. On syllabus, except last part. Quenching not likely to be examined.

Q7,8 not on syllabus

A4. 2000

Q1. On syllabus

Q2. On syllabus

Q3. Only first two parts are on syllabus (last part is superconductivity)

Q4. On syllabus.

Q5. On syllabus

Q6. Parts (b) and (e) are not on the syllabus

Q7,8 Not on syllabus

A4. 1999

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus

Q4. On syllabus

Q5. On syllabus

Q6. Part c is not on the syllabus

Q7,8 not on syllabus

A4. 1998

Q1. Parts c and d are not on the syllabus. In part a we mainly focused on powder diffraction (although the others methods were mentioned too).

Q2. On syllabus

Q3. On syllabus

Q4. On syllabus

Q5. On syllabus

Q6. On syllabus

Q7,8 not on syllabus

A4. 1997

Q1. On syllabus

Q2. On syllabus

Q3. Mostly not on the syllabus

Q4. On syllabus

Q5. Only first two parts on syllabus

Q6. On syllabus

Q7. Parts a and b on syllabus. Part c is more or less on syllabus but not emphasized.

Q8. Not on syllabus

A4. 1996

Q1. On syllabus

Q2. On syllabus

Q3. On syllabus

Q4. Last part not on syllabus

Q5. On syllabus

Q6. On syllabus

Q7. Only part d on syllabus