2019 ASTA exam feedback eve: Dec 4, 2019

L1SCI:

90940 (mechanics)

- Q1a: Points easy to see. Similar to past years. Less able students feel comfortable, familiar. So a good Q to start. / Can get part of the answer from b,
- Q1b: OK. This is part of the answer to Q1a.
- Q1c: Good cues.
- Q1d: A under graph. Good for Students. Physics teachers used to this sort of Q, so good training for L2, L3 Px. / However, they do not have to show much for an E Q.
- Q2a: Best Students will try to answer in a real sense, confusing. What will mark schedule give?
- Q2b Conversion for cm^2 to m^2 done for students, Surely for E grade students should be doing that conversion. Too easy for E
- Q2c: OK
- Q2d: Interesting Q, must discriminate better Students
- Q2e:Last 2 Q good to sort out better Students
- Q3a: Copyright photos are problematic & not needed. Why not use a copyright free image? / Graph line does not need to be colour – expensive, adds nothing, not worth the cost. / Calculation ok
- Q3b: Calculation ok
- Q3c: Nice scaffolding here. / Students explain vertical motion wrt friction, forward motion friction is ignored, as is appropriate.

90944 (acids/bases)

- Q1a: Although this is a copyright free image, colour is not needed, could do in B & W. / Substance states not needed at L1. / Both equations (Q 1 & 3)were carbonate rxns, nothing else tested.
- Q1b: OK
- Q1c: Strictly speaking can't answer because SA not controlled. Needed to say same size or shape to show SA not a variable.
- Q2a: Don't normally draw it out, makes it too easy. Year 10 kid could answer this, so not at L6 of curriculum
- Q2bi: Both ions have same electron arrangement, so why ask for both? However, is better for less able S.
- Q2c: very easy
- Q3a: Nice. "If any"? – doesn't change is still an obs. / Not all salts are neutral, are we expecting students to know NaCl is neutral?
- Q3b: "In an inv" is unnecessary and could confuse students.

90948 (genetics)

- Q1a: Colour not needed / Nice easy Q to start. / Only 4 lines for defn, helps students not write too much.
- Q2b: Hard Q, students know nothing about this. / Biology not correct, it's not no digestion, is partial or poor. / Would have been better to link DNA & milk digestion by mentioning a protein/enzyme. Or Give phenotypes. More detail needed to make this clearer.
- Q2a: Pedigree shows shading for affected individuals this year. Good
- Q2b: Better if Qb came before Qa. Punnet square also leads better to Qc
- Q2c: Not enough space to write ratio, many teach students to give phenotype with numbers, numbers alone are meaningless.
- Q3a: Trees starve to death is anthropomorphic & so poor science, die is enough. Also harder for ESL Students. / Not specific enough, not sure what was required – some die, some don't?
- Q3b: Not a lot to the Q, pretty straightforward so markers able to get enough info to discriminate.
- Also: Depth required not clearly shown in 3a, 3b, 1c, 1b, although 4 lines for definition does help. This can lead markers to discriminate between students by using things Students have written that were not asked for.

NZ sci teacher facebook page comments:

- Genetics: generally positive… some thought it was "too easy"! but 1 mentioned it was "quite heavy on mutations… thus hard to to well"...
- Acid/Base: again, generally positive… again, some thought it was "too easy"...some wondered if "electronic arrangement" was a typo - instead of "electron arrangement"
- Mechanics: pretty positive… but some were surprised by the use of "show the answers is…" - but it's common in physics exams - and hinges on kids showing their working. Also, Q2a seems a bit "odd"... what would markers expect from restating given information about pressure?

L1PHY:

90937 (electromag)

- Q1 good - covered what it needed to for static… familiar context.
- Q2 - good - plenty of space.
- Q3: 3d it could have had more space for answer BUT good scaffolding

90938 (waves)

PLEASE do not have copywrite photos - use cartoon or other "free" picture

- Q1bi: this is a longitudinal AND transverse wave if the wave is on the surface… - could alter text to "state the name of the type of wave shown in the diagram above"
- Q1d: looks like L2 idea (change in wavelength - thus refraction - thus NOT a L1 context)... Should have had some scaffolding like "make changes on the diagram"...
- Q2 - good job on breaking up bits of question
- Q3d - good bullet points

90939 (heat) No one was at a school with kids doing heat external

L2PHY:

91170 (waves)

- Q1a looks like Yr9 science… not L2 physics…
  it's good to start with "easy question"... but really?
- Q1cii - needs more than 4 lines for "good answer"
- Q1 - good choices to have different ray diagrams
- Q2 - good context… clear diagrams BUT it would be better if 36 degrees LOOKED like 36 degrees - as in "to scale somewhat" at least
- Q2c - needs more space for "good & detailed" answer including all relevant ideas
- Q2d - good hints to get kids started
- Q3a - MHz… ok… but nanoseconds?...
- Page 7. good
- Good to have spare diagrams at end

91171 (mechanics)

Yet again - copyright photo? really?

- Q1b - assuming no friction… AND needs more space for detailed answer
- Q1d - 1 method the answer does come out negative (thus below the ground)..would be better if given values lead to a large difference
- Q2 terminology of "plan view"... what is that?
- Kids were not given circumference equation this year - usually it's included…
- Q2b: "determine the horizontal forces"... implies tension explanation ... needs more space
- Q2c - level 3 conical pendulum context!?!?
- Q2d - more space for this calculation…
- Q3 - good context… good use of forces during collision - no rote learned answer
- Q3b - more space needed
- Q3c - more lines for answer

91173 (electromag)

- Show the answer is = good
- Page 3 - easy to compare the 2 given circuits AND good amount space for written answer
- Q2a - since answer is needed later - woud be better for "show the answer is"...
- Q2b - MORE space for in-depth answer
- Q3b - more space for in-depth answer
- page 7 - good but a bit more lines for answers

L3PHY

91523 (waves)

No cartoons of musical instruments? Really! The online document is insane without the actual photos.

- Q1a - why 4th harmonic?
- Q1d - needs much more space to fully describe ideas involved
- Q2b - good question…
- Q2b - would be better with “fundamental” specified so answer is just about THAT frequency in each
- Q3 - GOOD use of a colour diagram
- Q3b - good breakdown of “show that” before calculate wavelength
- Q3d - challenging - but good.

91524 (mechanics)

- Q1a - is technically L2 idea (conservation of momentum…) but is an easy starter
- Q1b - it’s good that a right angle is included - makes things EASIER
- Q1c - this assumes simple mass on a string instead of a very complex context of a bendable human doing this motion
- Would be better with BLANK page for P5 so that Q2 is all on 2 facing pages
- Q3b - GIVE SPACE for ref-circle or even DRAW a circle like usual

91526 (electromag)

- Cool context
- Q1b - takes quite a bit of time to solve… why not just the usual “write the equation”...
- Q2b: is this about a single loop or all 3 loops in total?
- No phasors? Q2 seemed a bit
- Q3b - would be better with MORE squares so an “easy” scale could fit the given graph…
- Q3d - good

L3BIO:

91606 Human evolution:

Q1:

- Good pictures in colour
- Nothing tricky (bread & butter)
- Lots of options for answers

Q2:

- All good – A is straight forward
- A picture would have been nice
- Nice to get more clarification NZQA past the 4 basic tool cultures – which was asked in this exam.

What could be included/ what are the parameters re current information (past the fundamentals). There is so much research being done on new finds it is hard to know where to stop when you are teaching this topic. It would be really helpful if the exam specs were much clearer e.g. teachers will need to teach … or multiregional vs out of Africa is now largely resolved by scientific consensus so students' answers will need to reflect this. It is difficult if the examining teacher is not up to date on the most recent finds/theories.

Q3:

- Endocranial feature – some students found this hard as endocranial features were not mentioned or even alluded to in the resource material, so gave them no lead in
- Amount of info that isn't relevant
- Use of both diminutive and small – superfluous, stick with small.

91605 Speciation:

Q1:

- Too much info that isn't relevant – there is a lot of reading in L3 Bio, making it a long exam. It is important that the resource material is as succinct as possible and only contains relevant info. It is questions like this that push us to suggest students attempt only 2 of the 3 standards

Q2:

- Good question – nice to have convergence in the question
- Plenty of opportunities to achieve and discriminate the better students

Q3:

- A lot of graph interpretation – why colour the numbers and not the key
- Flip the gecko so that snout-vent label makes sense, snout name is below snout end and vent is at vent end. But is this terminology necessary, could the examiner not have just used body length?
- Students only get 20minutes per question if they do all 3 papers. This question took far too long to analyse the information

91603 P&A

Q1:

- Repeat from 2017 paper
- Some students struggled to find 3 methods to navigate

Q2:

- Resource material talked about impact of rye grass on canola but the questions talked about impact of canola on rye grass. This confused some students.
- Bullet 3 should have clarified which plant as some students get freaked by the graphs so may not look closely at these.
- Again, for 20mins there is a lot of source material to analyse – assessing their time-management skills rather than knowledge.

Q3: Clearly spelt out criteria of what they were after. Good straightforward question.

L2BIO

91159 Gene Expression: Overall the paper was very neat – clear expectations

Q1:

- Basic question to get started
- Good bullets for b

Q2: Good metabolic pathway question

Q3: Chemical structure not really necessary you would want students to ignore the picture. Another example of time-waster. Although, it did serve to remind students of uracil in RNA

91157 Genetic Variation

Q1:

- Linked / unlinked genes – there's a difference in what is taught at school to what is taught at university (text)
- If they didn't put the black and brown body in it would have been more straight forward
- Felt like a very difficult question although the bullets helped.

Q2:

- Genetic drift came out of nowhere – would have been fine without
- Data table good – involved colour, temp etc

Q3:

- Photo doesn't really look like a mixture of the two – remove
- Punnet fine but the Excellence tacked on Question goes beyond the standard by asking for advantages of multiple alleles. EN 4 of the std says "monohybrid inheritance to show the effect of co-dominance, incomplete dominance, lethal alleles, and multiple alleles". Asking for the advantage of multiple alleles would be ok at scholarship not at L2.

91156 Cells
Q1:

- (a) far too easy for L2
- (b) worded poorly for some.
- Both a & b are at L5 of curriculum – inappropriate.
- (c) good

Q2:

- Title on graph (performance) – misleading/ nonsense
- Why start graph at 2; better & clearer drawn axes needed; brackets around the units needed
- Questions are fine

Q3:

- Diagram box on p6 useless – why not ask students to annotate the given diagram?
- (b) context unusual/confusing – could have picked something easier
- DNA replication not covered specifically

Scholarship BIO: could this not be on the same day as the Physics school (or any other Science). Doing this reduces the number of students who will attempt Schol Bio.

Q1: Good question – straight forward with familiar context
Q2:

- Grossed the students out but all the parts of a very good question – good context
- Too many graphs – too high level – not relevant – too many variables to compare
- Assessing too much data analysis rather than biological knowledge

Q3:

- Good question with 2 straightforward aspects asked
- Clearly identify Sumatra on the map – use colour perhaps?
- Not obscure

Perhaps too much of a jump between L2 and L3 & a smaller jump to scholarship. Suggests L3 set too high.

L1CHEM

90934 Demonstrate understanding of aspects of chemical reactions
Q2b: Iron chloride and sodium should have specified their states.
Q3: Use of the term “Well of spotting tile” may confuse students

90932 Demonstrate understanding of aspects of carbon chemistry:
Good paper

90933 Demonstrate understanding of aspects of selected elements:
No comments

L2CHEM

General comments around resource sheet that if we are giving some formula why not give all the formulae that may be used.
Command statements in questions were not ideal

91164 Demonstrate understanding of bonding, structure, properties and energy changes
Very long paper
Q1c

- Perhaps conductivity could have been assessed in part c then this use of solubility question could have been used after 2b the polarity question

Q2

- Why explain 3 molecules
- Good that correct font used for Cl so it didn't look like iodine
- Use of structure for organic compound applauded but do we need structure of other molecules

Q3

- Why so many different sig figs in (bi)
- Very little chemistry in c just maths

91164 Demonstrate understanding of the properties of selected organic compounds
Q2

- Layout of boxes B C D E with major and minor products caused confusion
- The compare aspect of (c) was challenging beyond the same number of C's

Q3

- Putting the three functional groups on one molecule then asking to test for the specific functional groups was a confusing approach. Why not 3 different substances

91164 Demonstrate understanding of chemical reactivity

- Good that rate and equilibrium were split between questions
- The use of phrase write the equation is sometimes confusing across papers with students considering a mathematical equation as a response. Could we write "the chemical equation" if that is what we want?

Q2

- Cii good challenging question

L3CHEM

91390 Demonstrate understanding of thermochemical principles and the properties of particles and substances

Q1

- (ii) good question students could compare readily as well as contrast
- (d) good use of font Cl

Q2

- (a) Issues with style of fonts for states, liquid and gas are different
- C The answer being only 10% of given value while practically it might be correct the difference would have made students question answer. The reason for difference will be incomplete combustion of hexane (an alcohol would be approx 30% difference). Looking forward to knowing what student responses are expected.

Q3

- More lines required for comprehensive response for both system and surroundings
- Assume Gibbs free energy explanation acceptable for part

91390 Demonstrate understanding of the properties of organic compounds

Good paper overall

Q1

- (b) is one test thus a negative outcome for one sample what is expected or does each sample in the pair have to be positively identified?
- C “steamy fumes” a new and confusing phrase

Q2

- (aii) What depth required, chemical properties not asked for hope its not expected in answer.
- Ciii more “steamy fumes”

Q3

- Box within a box not clearly visible worried that students missed part c
- C challenging question difficult to begin for less academic students

91390 Demonstrate understanding of equilibrium principles in aqueous systems

Good not combining solubility and acid base in the same questions

Q1: Could part c have been put before part b

Q2

- Well drawn curve
- (b) good to tell students exactly what is required

Q3: Again unusual command statement are we meaning compare and contrast?

SCOLCHEM

Very good that all the questions were accessible to candidates.