Review of Leaving Cert Higher Level

Applied Maths Papers since 2016

Ratings
1 = Easy
2 = Reasonably easy
3 = Regular
4 = Tricky
5 = Very difficult

Q1: Uniform Acceleration

2016: (a) Time velocity graph: not too challenging
(b) Two particles accelerating under gravity. **Rating 3**
2017: (a) Nice but needs care
(b) Conservation of energy needed. **Rating 3**
2018: (a) Problem involving friction. Nice.
(b) Not too challenging question about overtaking. **Rating 2**
2019: (a) Involves forces, but straightforward enough.
(b) They will meet when $s_1 + s_2 = d$ **Rating 3**

Q2: Relative Velocity

2016: (a) Long and challenging for a part (a), Use the '*t*-method.
(b) The second part is really tricky. **Rating 5**
2017: (a) Regular apparent velocity of wind problem.
(b) Last part is tricky. **Rating 4**
2018: (a) Aircraft travelling in the wind. Good.
(b) Crossing a river. Second part may be done using calculus or by showing that the angle between the relative velocity and the actual velocity must be 90° **Rating 3**
2019: (a) Apparent velocity of wind question : regular
(b) Best to use the t-method here. **Rating 3**

Q3: Projectiles

2016: (a) Time velocity graph: not too challenging.
(b) Maximum range problem. Needs care. **Rating 3**
2017: (a) Unnecessarily long part (a), There is an error (the particle hits the ground, not P).
(b) OK. Strikes plane at right angles. **Rating 4**
2018: (a) The heights of the two particles will be the same at all times.
(b) Can be done using calculus or trigonometric formulae. **Rating 3**
2019: (a) Best to let A be the origin.
(b) Very tricky to get started. Take origin to be point on plane directly under P. Then Tan $15^\circ = S_y/S_x$ **Rating 4**

Q4: Connected Particles

2016: (a) The accelerations are a and $2a$. Long!
(b) Very tricky last part. **Rating 4**

2017: (a) Very good pulleys question
(b) Classic wedge problem. **Rating 3**

2018: (a) Nice question involving friction & tension forces.
(b) The accelerations are a, $\frac{a+b}{2}$, and b. **Rating 2**

2019: (a) Very straightforward pulley question
(b) Regular wedge question **Rating 2**

Q5: Collisions

2016: (a) Use Conservation of Energy for (i) and (iii).
(b) Regular oblique collision **Rating 3**

2017: (a) Tricky direct collision (with a nasty quadratic in it!).
(b) Oblique collision. Not bad. **Rating 4**

2018: (a) Long but manageable.
(b) Reasonable oblique collisions question. **Rating 3**

2019: (a) Needs clear thinking, but doable
(b) Very straightforward oblique collision question **Rating 3**

Q6: Circular & SHM

2016: (a) Motion in a vertical circle. Tricky.
(b) Vertical elastic band. Not simple! **Rating 4**

2017: (a) Quite tricky SHM problem.
(b) Long, tortuous problem on vertical circular motion. **Rating 5**

2018: (a) SHM question involving horizontal elastic strings. OK.
(b) Vertical circular motion. **Rating 3**

2019: (a) Regular circular motion question
(b) Regular SHM with vertical elastic string **Rating 3**

Q7: Statics

2016: (a) There is an error in this question. The table has to be rough. 20 free marks!
(b) Tricky jointed rod question. **Rating 4**

2017: (a) Not at all easy! Three connected rods. Yuk!
(b) Not easy either. **Rating 4**

2018: (a) Regular ladder question.
(b) Jointed ladder. Care needed with moments equation (about A) **Rating 3**

2019: (a) Reasonable for part (a)
(b) Jointed wedge. Probably best to so the equations on FG and on FE. **Rating 3**

Q8: Moments of Inertia

2016: (a) Proof of rod.
(b) Needs care. Conservation of energy. **Rating 4**
2017: (a) Proof of rod.
(b) Extremely long and convoluted. **Rating 5**
2018: (a) Proof of disc.
(b) The masses are proportional to the area. **Rating 3**
2019: (a) Proof of rod
(b) Easy compound pendulum question **Rating 2**

Q9: Hydrostatics

2016: (a) Very challenging for a part (a)
(b) Yuk! Horrible stuff. **Rating 5**
2017: (a) Very tricky part (a)
(b) Long and tricky. **Rating 5**
2018: (a) Tricky floating problem.
(b) Rod leaning in water. OK. **Rating 3**
2019: (a) Tricky: need to be clear in your thinking
(b) Reasonable **Rating 4**

Q10: Differential Equations

2016: (a) Nice part (a)
(b) This is about deriving the SHM formulae. **Rating 3**
2017: (a) Reasonable part (a) with hint given.
(b) You need to be careful about distances and directions. **Rating 3**
2018: (a) Straightforward question on integration.
(b) Nice: they give the differential equation! **Rating 3**
2019: (a) Mixture of differentiation and integration
(b) Quite straightforward **Rating 3**

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Change Number:	2
Last Saved On:	24/06/2019 13:55:00
Last Saved By:	Oliver Murphy
Total Editing Time:	0 Minutes
Last Printed On:	02/07/2019 02:26:00
As of Last Complete Printing	
Number of Pages:	3
Number of Words:	680 (approx.)
Number of Characters:	3,876 (approx.)