PHYSICS

Paper 1524/22
Multiple Choice (Extended) 22

Question Number	Key	Question Number	Key	Question Number	Key	Question Number	Key
1	B	11	D	21	D	31	B
2	C	12	C	22	A	32	A
3	D	13	A	23	D	33	C
4	A	14	C	24	B	34	D
5	B	15	B	25	C	35	C
6	D	16	A	26	C	36	D
7	D	17	D	27	D	37	D
8	D	18	A	28	B	38	D
9	C	19	C	29	D	39	C
10	C	20	B	30	D	40	B

General comments

The majority of candidates had few difficulties. **Questions 3**, **4**, **5**, **6**, **12**, **15**, **22**, **26**, **31** and **33** were answered well by most candidates. **Questions 8**, **14**, **18**, **23**, **28** and **29** were more challenging for some candidates.

Comments on specific questions

Question 8

Most candidates recognised that the moment produced about the pivot by the crate is reduced when it is moved from position X to position Y. However, some incorrectly thought that the counterweight would need to be moved away from the pivot towards point P.

Question 13

Although many candidates correctly identified the quantities needed to calculate the power produced by the man, some thought that the weight of the crate was required rather than the horizontal force. Candidates needed to recognise that the movement of the point of application must be in the direction of the line of action of the force.

Question 14

Significantly more candidates thought that the length of section P was a measure of atmospheric pressure than the length of the mercury column.

Question 18

The solid line shows the position of the bridge at the coldest part of the night, so as the temperature rose the bridge would expand. At no point would it contract and therefore it could not go through positions **B** or **C** to be at position **D**, leaving position **A** as the only alternative.

Question 23

Stronger candidates managed the two steps in the calculation. First, they used the speed of light in a vacuum and the speed in the plastic prism to calculate the refractive index (n) of the material of the prism. They then used $n = 1 / \sin c$ to find c, the critical angle.

Question 28

Only stronger candidates recognised that an uncharged object is attracted to both positively and negatively charged objects.

Question 29

Only stronger candidates recognised that the resistance of a length of wire is inversely proportional to its cross-sectional area and therefore inversely proportional to it diameter squared. Thus, doubling the diameter reduces the resistance by a factor of four.

Question 36

Many candidates recognised the three-dimensional nature of the interaction between a current and a magnetic field, but some did not apply the left-hand rule correctly.