PHYSICS

SUBJECT 9188

PAPER 3

GENERAL COMMENTS

Performance by candidates in this component was generally good. The overall quality of the candidates was better than the previous year 2008. By any standard the component 9188/03 was a standard paper, for it did not produce extremes in performance. Statistics on performance produced a normal distribution curve, a curve without positive or negative skew.

SPECIFIC COMMENTS

Popular questions with candidates were Question 1, Question 2 and Question 4. Question 3 was unpopular.

QUESTION 1

Question 1(a) (i) was generally well done. However it was surprising to note that some candidates confused work and moment of force. Expected definition was: “Product of force and displacement” or “product of force and distance in the direction of the force”.

Question 1(a) (ii) was not well done. Only the strong and the average candidates succeeded in deriving change in potential near the earth’s surface. Weaker candidates derived using gravitational law. 0.5% of the candidature got question 1a (iii) right. The rest scored badly on this part question. The problem was on calculating change in the vertical height of the centre of mass after tilting the block through 30^0, so that the block rested with one of its corners.
Numerical answer: 1b (iii) 4, 03 J.

On question 1(b) (i), the majority of the candidates got confused with “direction of wave motion” and “direction of wave propagation”. From the responses by candidates, direction of wave propagation implied direction of particle vibration which was judged wrong. Nearly all candidates could not explain with the aid of a diagram why progressive transverse wave crests and troughs move away from the source of disturbance. The marking scheme looked for particle vibrations transferring energy to neighbouring particles as they vibrated and the particles not being in phase with each other.

Question 1(c) (i) came to the rescue of the weak candidates from scoring 0 marks in Question 1. However in Question 1(c) (ii), even some of the strongest candidates could not express the volt in its base units.

QUESTION 2

Question 2 was like a compulsory question for the candidates, as most of the candidates attempted it. This question was well done, with the majority scoring credible marks. However Question 2 (a) (i) and (ii) were not well done. The majority of the candidates could not define properly the separating distance r between point masses / particles / centres of the masses. Separating distance r is not between bodies or masses but between their centres or point masses. Candidates need to be informed that sometimes book definitions are not examination specific.

Calculations in this question were well tackled.
Numerical Answers 2(b). 3. 13 x 10^8J

QUESTION 3

This was an unpopular question with candidates. It was observed in Question 3(a) (i) and (ii) that most of the candidates could not explain the terms:- angular frequency and phase difference. Candidates, as a result, could not analyse and interpret graph in Question 3 (b) to determine the leading oscillation. Strong candidates who could state the leading oscillation could not give the correct reason. They had hard times with the calculations in Question 3 (b) (ii). Question 3 (c) was not well done. Candidates sketched sine curves for velocity – displacement graph for one of the oscillations. The velocity – displacement graphs for sinusoidal motions are always elliptical, they are eploids.

Numerical Answers: 3(b) (ii). 2.5 rad.

QUESTION 4

Like Question 2, Question 4 was very popular with candidates. Question 4(a) was excellently done by all candidates who attempted this part question. Question 4(b) was moderately done. Application of Newton's third Law of Motion to derive the principle of momentum proved difficult to most candidates. They did not realize that bodies in contact during collision are in contact for the same time duration, so impulse for each body is the same because they exert on each other equal and opposite forces.

Calculations in Question 4(c) were well carried out by most candidates.
Numerical Answers: 4(c). 7.36x10^5J