

Name..... Set..... Don.....



## Winchester College

### 5<sup>th</sup> year Easter Revision Papers 2010

#### Paper 1: Multiple Choice

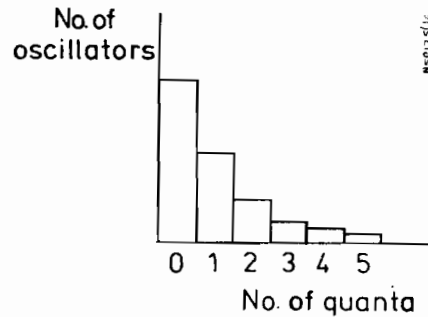
There are 40 multiple choice questions. You should answer ALL of them. Select ONE correct answer for each question from the options A, B, C, D or E, and mark it in pencil on the answer grid provided.

Marks will not be deducted for wrong answers.

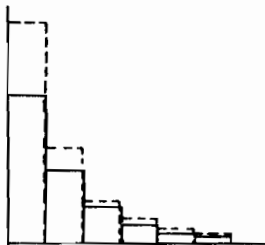
Time allowed: 1 hour 15 minutes.

You may use a calculator.

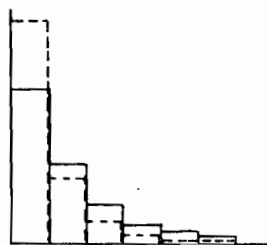
1 A crystalline solid is at equilibrium at a certain temperature. The numbers of oscillators with 0, 1, 2, etc., quanta of energy are as shown.



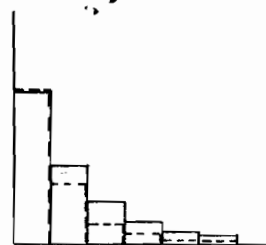
The solid is now made *hotter*. In which diagram A to E does the distribution shown by dotted lines correctly show the new equilibrium distribution by comparison with the old one?



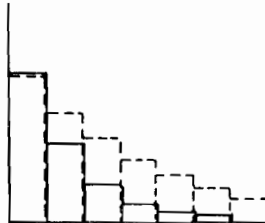
A



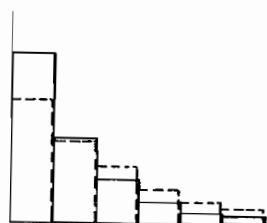
B



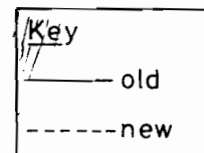
C



D



E



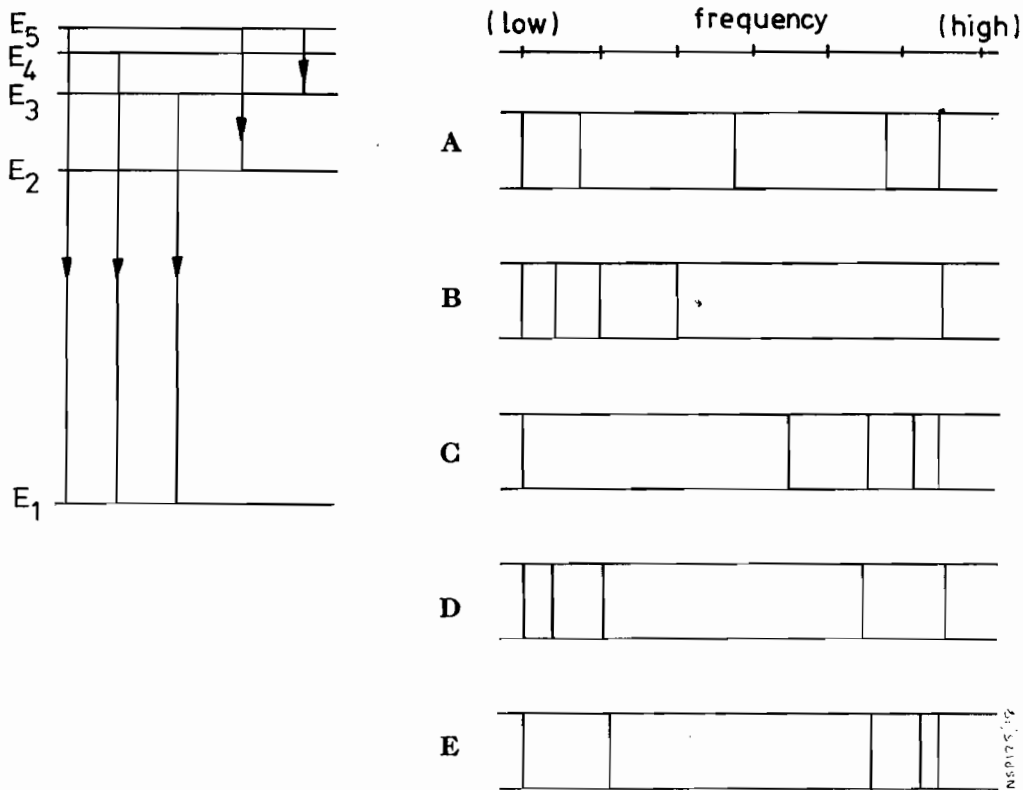
2 A calculation of the kinetic energy of an electron trapped in a 'box' is made as part of a rough quantum theory of an atom such as hydrogen, at low energies. Which one of the following quantities is **not** involved in the calculation?

- A the Planck constant  $h$
- B the momentum of the electron
- C the wavelength associated with the electron
- D the size of the 'box' in which the electron is trapped
- E the speed of electromagnetic waves

3

3 The diagram below on the left shows five energy levels of an atom, one being much lower than the other four. Five transitions between the levels are indicated, each of which will produce a photon of definite energy and frequency.

On the right are shown five spectra A to E. Which one best corresponds to the transitions between levels which are indicated?



Section C

4 If you take a paper clip and bend it, it stays bent; it doesn't spring back and it doesn't break. If you try to bend a glass rod it will simply break.

The difference could lie either in the particular atoms of which metals and glass are made up, or in the way they are put together—probably both.

N. F. Mott, 'The Solid State' Scientific American book 'Materials' page 21.

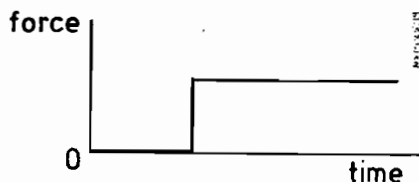
Which of the following three kinds of statement is/are made in this quotation?

1. statements proposing fundamental laws.
2. statements reporting experimental facts.
3. statements about hypotheses to explain experimental facts.

A 1 only.      B 2 only.      C 1 and 3 only.      D 2 and 3 only.      E 1, 2 and 3.

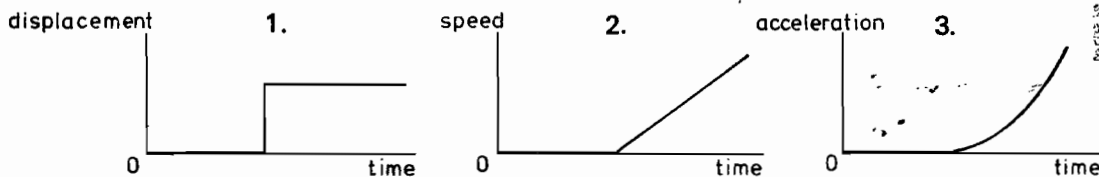
4

5 A car driver presses the accelerator sharply when the traffic lights go green. The force on the car varies with time as shown.



The graphs 1 to 3 below attempt to show the variation with time of

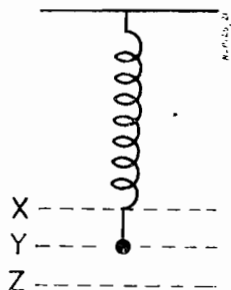
1. the car's displacement.
2. the car's speed.
3. the car's acceleration.



Which of these graphs is/are correct?

- A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

6 A mass hanging on a spring oscillates vertically between X and Z. Its equilibrium position is at Y. The spring has negligible mass.



Which of the following is/are true?

1. The biggest net *downward* force acts on the mass when it is at X.
2. The total potential energy of mass and spring has a minimum value at Y.
3. The biggest *upward* acceleration of the mass occurs when it is at Z.

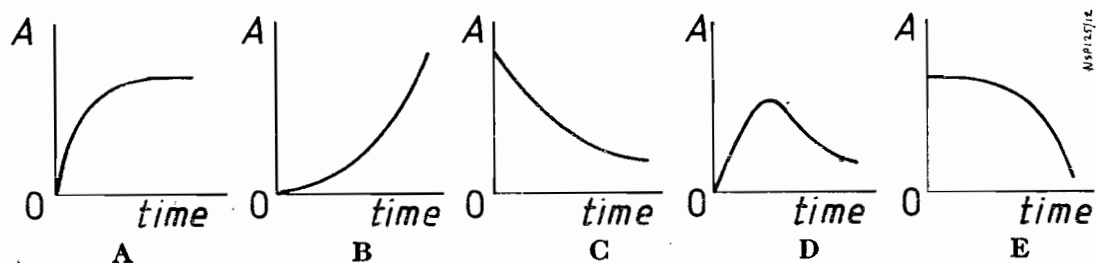
- A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

7 The actinium series of radioactive decays starts with an isotope of uranium, mass number 235, atomic number 92.

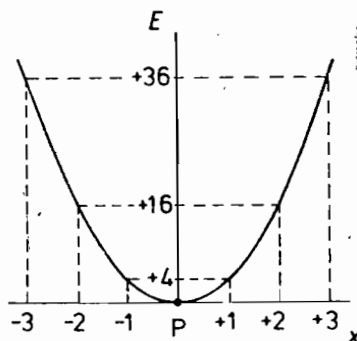
What is the mass number and atomic number of the isotope reached after the first few decays in the chain of decays, during which a total of 5 alpha particles and 2 electrons is emitted?

	mass number	atomic number
A	213	82
B	215	80
C	215	84
D	227	87
E	227	93

8 A newly prepared sample of a radioactive material  $X$  starts to decay into a daughter product  $Y$  which is itself radioactive. Which graph shows correctly the variation with time of the activity of the daughter product  $Y$  (if the half-lives of  $X$  and  $Y$  are much the same)?



9 The graph shows the variation of the potential energy  $E$  of a body, with its displacement  $x$  from a fixed point  $P$ . The magnitude of the force on the body is proportional to  $x$ .



Which of the following is/are correct inferences from this information?

1. The graph will have the form  $E = kx^2$ , where  $k$  is a constant.
2. The direction of the force will be *towards*  $P$ .
3. If the body has 16 units of kinetic energy at  $P$ , it will be at rest at  $x = 2$  and  $x = -2$ .

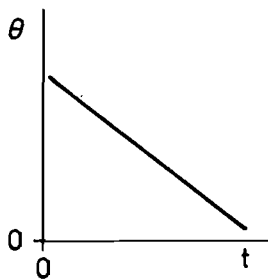
A 1 only.      B 2 only.      C 1 and 3 only.      D 2 and 3 only.      E 1, 2 and 3.

6

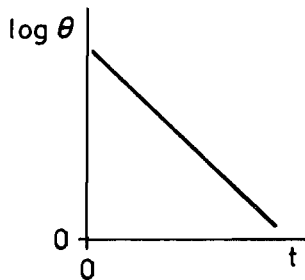
10 If an object is hotter than its surroundings, it cools down if not supplied with energy.

Assume that the rate of fall of the temperature difference  $\theta$  between the object and its surroundings is proportional to the temperature difference.

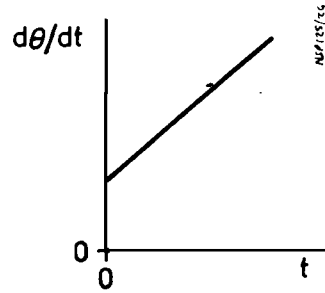
If so, which of the following three graphs correctly give(s) relationships between temperature difference  $\theta$  and time  $t$ ?



1



2



3

- A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

11 The Boltzmann factor  $e^{(-E/kT)}$  helps in explaining a large number of phenomena.

Which of the three facts below does it help to explain?

1. Many slow chemical reactions can be speeded up a great deal by raising the temperature a little.
2. The bonds in crystalline NaCl, KCl, NaBr, etc. are ionic bonds of great strength.
3. Only when a gas is made very hot are more than a very few of its atoms or molecules ionised.

- A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

12 An electron gun sends a beam of electrons through powdered graphite, which diffracts the electrons, producing two concentric diffraction rings on a fluorescent screen.

Which of the following statements about this effect is/are true?

1. The two rings are due to different sets of layers of atoms, the larger ring being due to the set of layers with the smaller spacing.
2. *Increasing* the speed of the electrons *decreases* the brightness of the diffraction rings by reducing the time the electrons spend in the graphite.
3. *Increasing* the anode voltage *decreases* the diameters of both rings, by reducing the wavelength associated with the electrons.

- A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

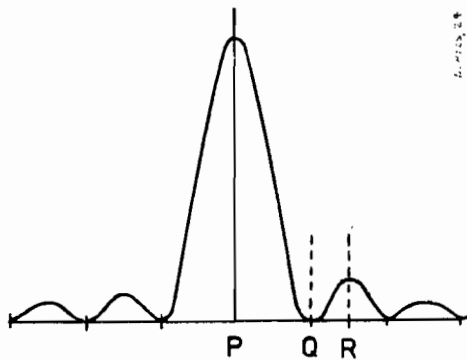
13 If X-rays are used in a Bragg diffraction experiment, so that sharp peaks of intensity are detected at angles given by  $\lambda = 2d \sin \theta$ , which of the following correctly predict(s) what could (at least in principle) be observed, if the crystalline material under examination were made hot (but did not melt)?

1. The energy  $E = hf$  of the X-ray photons would become equal to the energy of oscillation of the atoms.
2. If the crystal expands when made hot, the peaks would shift to slightly smaller angles.
3. The peaks would become slightly less sharp, because the atoms would be oscillating more so that the distance between layers of atoms would be less definite.

- A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

7

14 The graph indicates the variation of intensity with position on a distant screen, of parallel monochromatic light diffracted by a single slit.

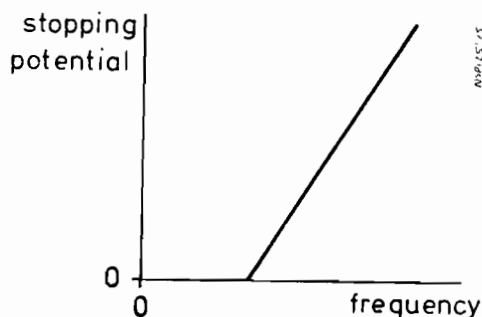


Which of the following statements about the places P, Q and R on the screen is/are correct?

1. At P there is the greatest probability of arrival of a photon.
2. At Q, the probability of arrival of a photon will *increase* if the slit is made just a little narrower.
3. At R, the probability of arrival of a photon will *decrease* if the slit is made just a little narrower.

A 1 only.      B 2 only.      C 1 and 3 only.      D 2 and 3 only.      E 1, 2 and 3.

15 Monochromatic light was shone on the surface of a metal having a particular work function. The graph shows how the potential difference required to stop the most energetic electrons emitted varied with the frequency of the light.



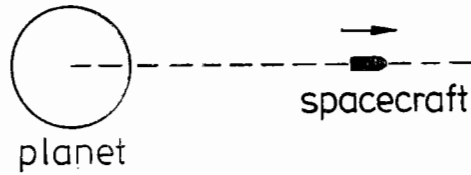
Which of the following correctly describe(s) aspects of this and similar experiments?

1. The gradient of the graph would be the same if other metals were used.
2. The intercept on the frequency axis would be the same if other metals were used.
3. A typical range of values of the stopping potential, using visible light, would be around 100 to 200 V.

A 1 only.      B 2 only.      C 1 and 3 only.      D 2 and 3 only.      E 1, 2 and 3.

16, 17

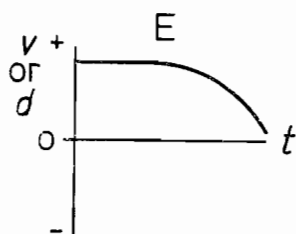
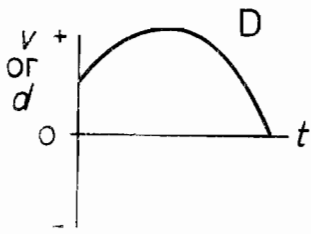
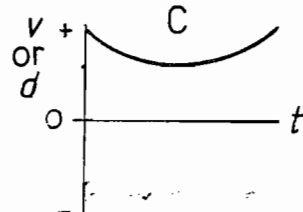
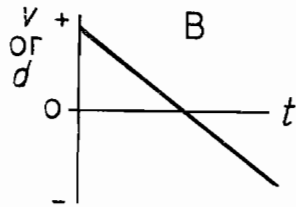
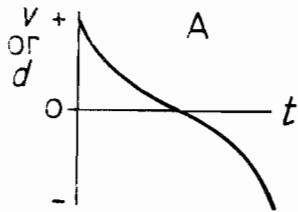
8



NSP138/3

A spacecraft is travelling directly away from a planet, as shown, when its motor fails. The craft now moves only under the influence of the planet's gravitational field.

The graphs below show possible variations with time  $t$  of the velocity  $v$  of the spacecraft, or of its distance  $d$  from the planet, in each case from the moment the motor stops.

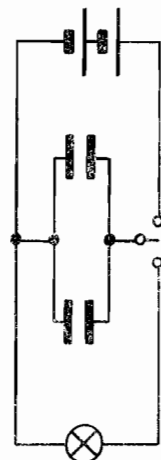
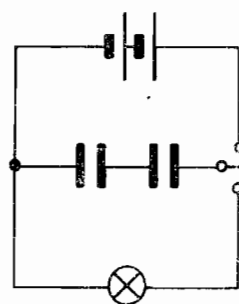
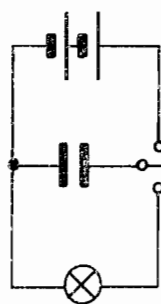
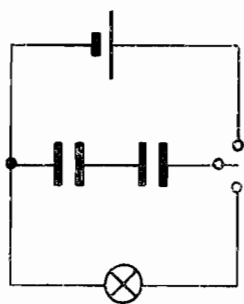
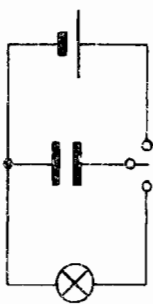


NSP138/4

16 Which graph best shows the variation of the velocity  $v$ ?

17 Which graph best shows the variation of the distance  $d$  from the planet?

18, 19 The circuits A to E are made up from identical cells, capacitors and lamps. In each circuit the capacitor system is first fully charged from the battery and then discharged through the lamp.



NSP138/5

A

B

C

D

E

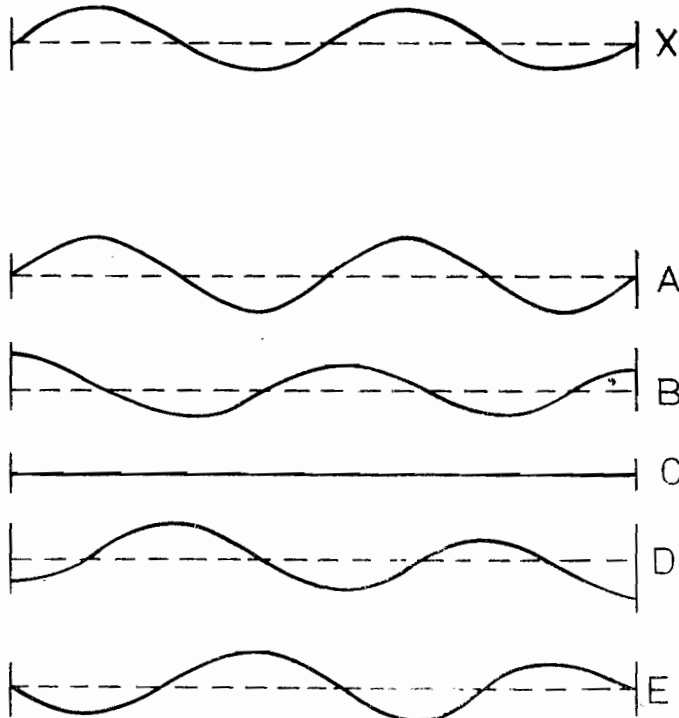
18 In which circuit is *most* energy delivered to the lamp?

19 In which circuit is *least* energy delivered to the lamp?



9

20, 21 In the diagram below, X shows the displacement of part of a rope on which there is a wave. A to E show displacements of the same part of the rope at later times.

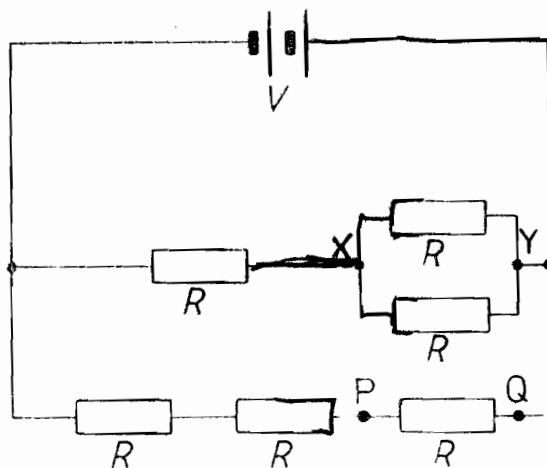


Which diagram correctly shows the displacement of the rope exactly one period of oscillation after the instant shown in X, if the wave on the rope:

20 is a travelling wave?

21 is a standing wave?

22, 23, 24



A battery of e.m.f.  $V$  and negligible internal resistance is connected to the arrangement of resistors shown. All the resistors have the same resistance  $R$ .

Here are five possible values for potential differences across parts of the circuit.

- A zero      B  $V/2$       C  $V/3$       D  $2V/3$       E  $V$

Which of A to E above is the potential difference

22 between points X and Y?

23 between points P and Q?

24 between points X and P?

25 In which of the following types of field can a charged, massive, moving particle be made to travel in such a way that there is no force on it due to the field (the field not being zero)?

1. a uniform magnetic field.
2. a uniform electric field.
3. a uniform gravitational field.

A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

26 Which of the following arguments about electromagnetic waves is/are correct?

1. Because theory predicts that electromagnetic waves are transverse waves, it would be reasonable to expect to be able to polarize them.
2. Because gamma rays and radio waves both carry energy, it is reasonable to infer that both are electromagnetic.
3. Because electromagnetic waves travel at  $3 \times 10^8 \text{ m s}^{-1}$ , it would be reasonable to expect to observe diffraction of waves of frequency  $10^8 \text{ Hz}$  by an object 3 m in diameter.

A 1 only.    B 2 only.    C 1 and 3 only.    D 2 and 3 only.    E 1, 2 and 3.

27, 28 Here are some facts about the Inter-City 125 train.

At its top speed of  $50 \text{ m s}^{-1}$  the engine exerts a power of about 2 MW. The mass of train and engine is about 400 tonnes (400 000 kg).

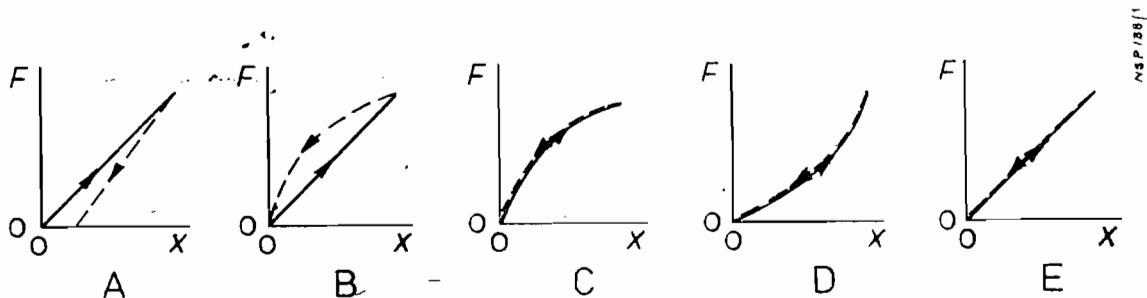
A 20    B 40    C 100    D 500    E 4000

Which of A to E above is

27 the best estimate of the kinetic energy of train and engine at top speed, measured in MJ?

28 the best estimate of the tractive force of the engine needed to overcome drag at top speed, measured in kN?

29, 30 Graphs A to E show how the compressive force  $F$  in five springs varies with the compression  $x$ . The solid lines show the variation of the force while the spring is being compressed. The broken lines show the variation of the force when the spring is relaxed again.



29 If a mass moving at a certain speed hit each spring and rebounded, from which spring would it rebound with a lower speed?

30 Which one of the springs must somehow be supplying a net amount of energy when compressed and then released?

31 A light car with very soft springs bounces up and down on its springs after hitting a bump, with a period of roughly  $\sqrt{2} \text{ s}$ . The mass of car and driver is 300 kg.

If the driver now packs in several friends, so that the mass of car and occupants is 600 kg, which one of the following is the best estimate of the new period of oscillation of the car on its springs?

A  $2\sqrt{2} \text{ s}$     B 2 s    C  $\sqrt{2} \text{ s}$     D 1 s    E  $1/\sqrt{2} \text{ s}$

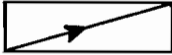

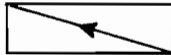


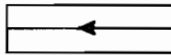
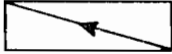

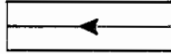

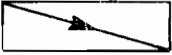
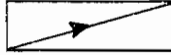



32 Here are some values of the potential difference  $V$  across a device, and the resulting current  $I$  through the device.

$V$ in volts	0	50	100	150	200	250
$I$ in amps	0	0.18	0.25	0.31	0.36	0.40

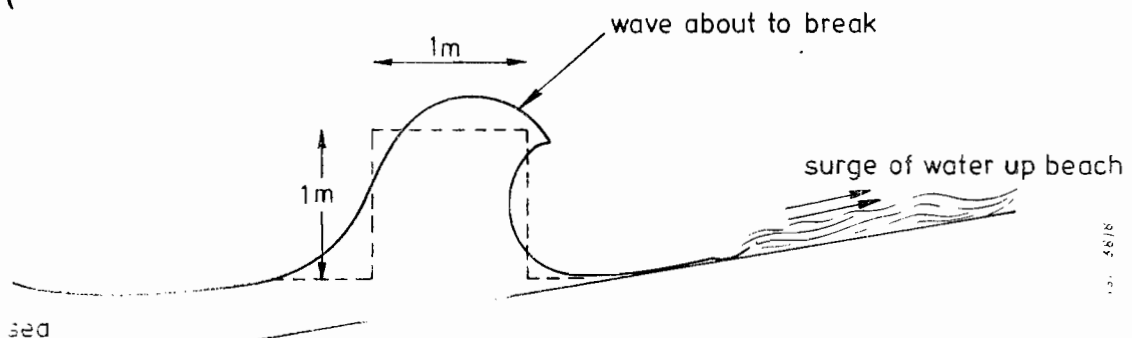
Which one of the relationships A to E agrees best with these results?

- A  $V = kI$     B  $V = kI^2$     C  $V = kI^3$     D  $V = k/I$     E  $V = k/I^2$

33 Which one of the five attempts A to E below to add or subtract two vectors (such as velocities or forces) is correct?

- A  minus  gives 
- B  minus  gives 
- C  plus  gives 
- D  plus  gives 
- E  minus  gives 

34 This question is about guessing the power delivered to a beach by breaking waves in a storm.



To simplify the guess, suppose that a wave about to break is treated as a 'wall' of water 1 m high and 1 m from front to back. Suppose such waves break once every 5 seconds, and that the water from a wave rushes up the beach at  $10 \text{ m s}^{-1}$ . Which one of the following is then the best estimate of the power delivered by waves breaking on the beach along one kilometre of beach?

(density of water  $1000 \text{ kg m}^{-3}$ )

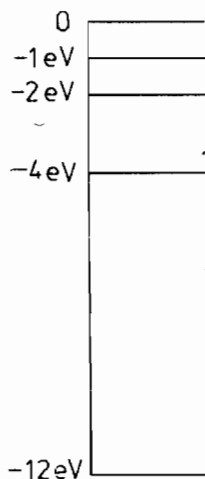
- A 1 MW    B 10 MW    C 100 MW    D 1000 MW    E 10 000 MW

35 Which one of the following electromagnetic effects *also* involves resonance?

- A diffraction at a single slit
- B diffraction by a grating
- C absorption of infra-red radiation by solid sodium chloride
- D propagation of radio waves through a vacuum
- E quantisation of energy in photons,  $E = hf$

36 An (imaginary) atom has just the five energy levels shown. It can change from any one level to any other.

Which one of the following statements about this imaginary atom would be correct?



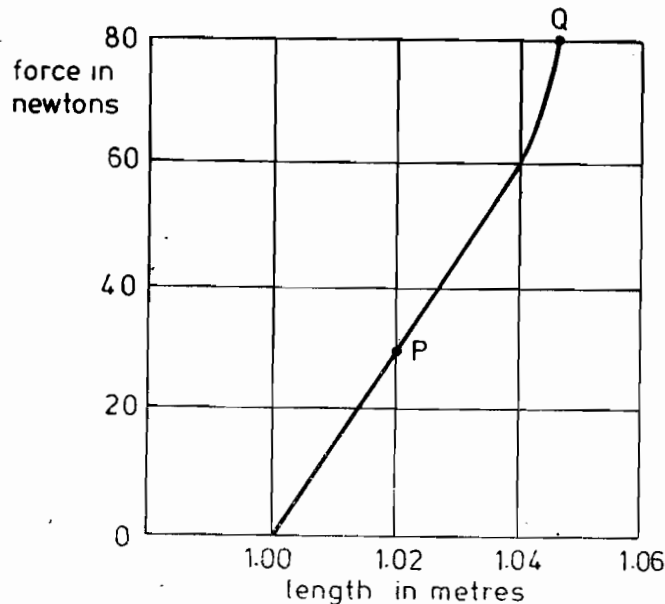
- A The most stable state of the atom is the level with zero energy.
- B If the atom is in the level  $-4$  eV it can emit a photon and arrive in the level  $-2$  eV.
- C If the atom is in the level  $-12$  eV, an electron with energy  $8$  eV colliding with the atom can lose all its energy to the atom, leaving it in the level  $-4$  eV.
- D If the atom is in the level  $-1$  eV, it can emit an electron of energy  $1$  eV and arrive in the level with zero energy.
- E If the atom is in the level  $-4$  eV, it can emit photons of energy  $2$  eV,  $3$  eV and  $4$  eV, changing levels as it does so.

37 If a photon (of green light) having energy  $40 \times 10^{-20}$  J ejects an electron from a metal having an electronic work function of  $32 \times 10^{-20}$  J, what is the best estimate of the maximum speed with which the electron can leave the metal? (mass of electron  $\approx 10^{-30}$  kg)

- A  $1 \times 10^5$  m s $^{-1}$
- B  $4 \times 10^5$  m s $^{-1}$
- C  $16 \times 10^5$  m s $^{-1}$
- D  $3 \times 10^8$  m s $^{-1}$
- E  $8 \times 10^8$  m s $^{-1}$

13

38



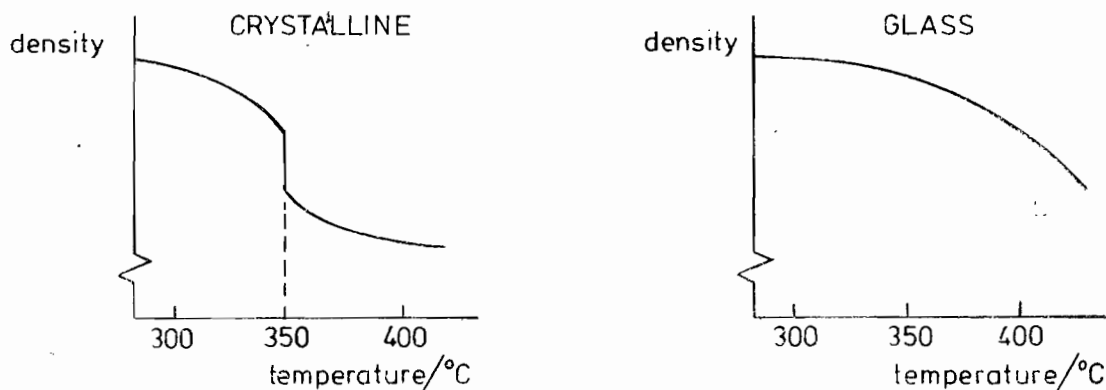
The graph shows how the length of an acrylic material varies with the tension in the specimen. The specimen breaks at Q, at which point its cross-section is  $4 \text{ mm}^2$ .

Which of the following can correctly be deduced from this information?

- 1 The strain at P is 2%.
- 2 The breaking stress is  $20 \times 10^6 \text{ N m}^{-2}$ .
- 3 Hooke's Law is obeyed up to a force of 60 N.

A 1 only      B 2 only      C 1 and 3 only      D 2 and 3 only      E 1, 2, and 3

39. The graphs below show the (small) changes in density with temperature of a material which is crystalline when solid, and of a glass. Both are solid at  $300^\circ\text{C}$ ; both are liquid at  $400^\circ\text{C}$ . The crystalline solid melts at  $350^\circ\text{C}$ ; the glass softens over a range of temperatures around  $350^\circ\text{C}$ .



Which of the following statements may be deduced from the shapes of the graphs?

- 1 The crystalline material contracts abruptly when it melts.
- 2 The glass expands more per degree temperature rise when molten than when solid.
- 3 The crystalline material, when liquid, expands less and less per degree temperature rise, as the temperature goes up.

A 1 only      B 2 only      C 1 and 3 only      D 2 and 3 only      E 1, 2 and 3

40. Pocket calculators contain oscillators which have a frequency which may be as high as 250 kHz. A student wants to estimate if he could detect the oscillating magnetic field near his calculator using a search coil and an oscilloscope.

His oscilloscope will just detect variations of 0.1 V. His search coil has 1000 turns. He measures its area as  $10^{-4} \text{ m}^2$  and writes (correctly) the equation for the induced voltage:

$$V = 1000 \times 10^{-4} \times dB/dt.$$

He argues that at 250 kHz the field changes from maximum to zero in  $\frac{1}{4}$  cycle, that is  $10^{-6} \text{ s}$ , and he proposes to use this to estimate  $B$  from  $dB/dt$ .

Following this argument, what should his estimate of the  $B$ -field he can just detect be?

A  $10^{-7}$  tesla      B  $10^{-6}$  tesla      C  $10^{-5}$  tesla      D  $10^{-4}$  tesla      E  $10^{-3}$  tesla







Examination period SH	
Year 2009	
Examination type Test	Centre name WINCHESTER COLLEGE
Physics don	Candidate name

Instructions to Candidates

1. Fill in your name and physics don in the space provided
2. Use an HB pencil. Do not use ink or ball point pen.
3. Mark with a single stroke the letter of the answer that you think is correct, thus: A
4. If you wish to cancel an answer, fill in the box below your mark thus:  Then mark another letter.

1 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	21 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	41 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	61 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
2 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	22 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	42 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	62 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
3 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	23 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	43 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	63 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
4 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	24 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	44 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	64 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
5 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	25 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	45 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	65 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
6 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	26 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	46 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	66 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
7 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	27 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	47 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	67 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
8 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	28 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	48 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	68 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
9 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	29 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	49 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	69 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
10 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	30 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	50 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	70 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
11 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	31 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	51 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	71 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
12 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	32 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	52 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	72 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
13 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	33 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	53 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	73 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
14 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	34 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	54 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	74 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
15 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	35 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	55 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	75 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
16 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	36 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	56 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	76 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
17 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	37 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	57 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	77 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
18 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	38 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	58 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	78 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
19 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	39 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	59 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	79 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E
20 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	40 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	60 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	80 <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E