

**Multiple Choice Answers**

Q17: B

Q18: C

**Multiple Choice Answers**

Q17: C

Q18: A

**Multiple Choice Answers**

Q17: B

Q19: B

**Multiple Choice Answers**

Q17: D

**Multiple Choice Answers**

Q18: C

**Multiple Choice Answers**

Q18: D

Q19: C

|      |                                                                                                            |
|------|------------------------------------------------------------------------------------------------------------|
| 3(a) | $E_{(K)} = \frac{1}{2}mv^2$ $110 = \frac{1}{2} \times 5.5 \times v^2$                                      |
|      | $v = 6.3 \text{ m s}^{-1}$                                                                                 |
| 3(b) | $(\Delta)E_{(P)} / 20 = mg(\Delta)h \text{ OR } (\Delta)E_{(P)} / 20 = mgx_0$                              |
|      | $(x_0 =) 20 / 5.5 \times 9.81 = 0.37 \text{ (m)}$ <p>Allow <math>(\Delta)h</math> for <math>x_0</math></p> |
| 3(c) | $[\max (E_{(P)})] = 110 + 20 = 130 \text{ J}$                                                              |

|          |                                                                              |
|----------|------------------------------------------------------------------------------|
| 3(d)     | $(\max) E_{(P)} / 130 = \frac{1}{2} F_{(0)} x_{(0)}$                         |
|          | $(F_0 =) 2 \times 130 / 0.37 = 700 \text{ (N)}$                              |
|          | <b>or</b> $(\max) E_{(P)} / 130 = 1 / 2 k x_{(0)}^2$<br>$(F_0 =) k x_{(0)}$  |
|          | $(F_0 =) 2 \times 130 \times 0.37 / (0.37)^2 = 700 \text{ (N)}$              |
| 3(e)(i)  | (weight) = $5.5 \times 9.81$                                                 |
|          | resultant force = $700 - (5.5 \times 9.81)$<br>= 650 N                       |
| 3(e)(ii) | $F = ma$                                                                     |
|          | $a = 650 / 5.5$ <b>or</b> $(700 / 5.5) - 9.81$<br>$a = 120 \text{ m s}^{-2}$ |

**Multiple Choice Answers**

Q15: B