

PEPERIKSAAN PERCUBAAN SPM
NEGERI PAHANG
TAHUN 2009

**PERATURAN PERMARKAHAN
SAINS SPM 2009**

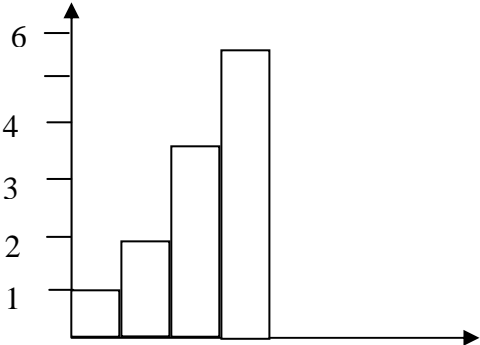
KERTAS 2

Section A
Bahagian A

| Question Number | Answer | Mark | Σ Mark | | | | | | | | | | | | | | | | |
|--|--|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|---|---|---|---|---|---|---|---|--|
| 1a | <p>Able to complete the table correctly (pengelasan)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <tr> <td style="padding: 5px;">Length of leaves(cm) <i>Panjang daun (cm)</i></td> <td style="text-align: center; padding: 5px;">4- 6</td> <td style="text-align: center; padding: 5px;">7- 9</td> <td style="text-align: center; padding: 5px;">10- 12</td> <td style="text-align: center; padding: 5px;">13- 15</td> <td style="text-align: center; padding: 5px;">16- 18</td> <td style="text-align: center; padding: 5px;">19- 21</td> <td style="text-align: center; padding: 5px;">22- 24</td> </tr> <tr> <td style="padding: 5px;">Bilangan daun <i>Number of leaves</i></td> <td style="text-align: center; padding: 5px;">3</td> <td style="text-align: center; padding: 5px;">4</td> <td style="text-align: center; padding: 5px;">6</td> <td style="text-align: center; padding: 5px;">7</td> <td style="text-align: center; padding: 5px;">3</td> <td style="text-align: center; padding: 5px;">5</td> <td style="text-align: center; padding: 5px;">2</td> </tr> </table> <p style="text-align: right; margin-right: 50px;">6-7 correct - 2m 4-5 correct - 1m</p> | Length of leaves(cm) <i>Panjang daun (cm)</i> | 4- 6 | 7- 9 | 10- 12 | 13- 15 | 16- 18 | 19- 21 | 22- 24 | Bilangan daun <i>Number of leaves</i> | 3 | 4 | 6 | 7 | 3 | 5 | 2 | 2 | |
| Length of leaves(cm) <i>Panjang daun (cm)</i> | 4- 6 | 7- 9 | 10- 12 | 13- 15 | 16- 18 | 19- 21 | 22- 24 | | | | | | | | | | | | |
| Bilangan daun <i>Number of leaves</i> | 3 | 4 | 6 | 7 | 3 | 5 | 2 | | | | | | | | | | | | |
| 1b | <p>Able to plot a graph correctly (berkomunikasi) All point are transferred correctly – 1m Correct shape – 1m</p> <div style="text-align: center; margin: 10px 0;"> </div> | 2 | | | | | | | | | | | | | | | | | |
| 1c | <p>Able to write the conclusion correctly (Mentafsir data) <u>Sample answer</u> Continuous variation</p> | 1 | | | | | | | | | | | | | | | | | |
| JUMLAH | | | 5 | | | | | | | | | | | | | | | | |

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|------------------------------------|---|-----------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|------------------------------------|----|----|----|----|----|----|----|---|---|----------------------------------|---|----|----|----|----|----|----|----|----|----------|--|
| <p>2a</p> | <p>Able to complete the table correctly (Meramal)</p> <table border="1"> <tr> <td>Times (minutes)</td> <td>0</td> <td>0.5</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>4.0</td> </tr> <tr> <td>Burette reading (cm³)</td> <td>50</td> <td>40</td> <td>35</td> <td>28</td> <td>20</td> <td>16</td> <td>12</td> <td>9</td> <td>7</td> </tr> <tr> <td>Volume of gas (cm³)</td> <td>0</td> <td>10</td> <td>15</td> <td>22</td> <td>30</td> <td>34</td> <td>38</td> <td>41</td> <td>43</td> </tr> </table> | Times (minutes) | 0 | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | Burette reading (cm ³) | 50 | 40 | 35 | 28 | 20 | 16 | 12 | 9 | 7 | Volume of gas (cm ³) | 0 | 10 | 15 | 22 | 30 | 34 | 38 | 41 | 43 | <p>2</p> | |
| Times (minutes) | 0 | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Burette reading (cm ³) | 50 | 40 | 35 | 28 | 20 | 16 | 12 | 9 | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| Volume of gas (cm ³) | 0 | 10 | 15 | 22 | 30 | 34 | 38 | 41 | 43 | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2b</p> | <p>Able to state relationship between the volume of gas and time correctly (Hubungan ruang dan masa) <u>Sample answer</u></p> <p>1. The volume of gas increase as the time increase 2. Time increases the volume of gas also increases</p> | <p>1</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2c(i)</p> | <p>Able to state the constant variable correctly (variable) <u>Sample answer</u></p> <p>1. Concentration of dilute sulphuric acid 2. Amount of zinc</p> | <p>1</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2c(ii)</p> | <p>Able to state the responding variable correctly <u>Sample answer</u></p> <p>The volume of gas collected</p> | <p>1</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JUMLAH | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>3a</p> <p>Able to state the hypothesis of the experiment correctly <u>Sample answer</u></p> <p>1. The plant need nitrogen to grow healthy 2. Without nitrogen the seedling cannot grow healthy 3. Knops culture solution provided the seedling for healthy growth</p> <p>3b</p> <p>Able to state the manipulated variable for the experiment correctly <u>Sample answer</u></p> <p>Type of culture solution</p> <p>3c</p> <p>Able to state one observations on the plant in th test tubes P and Q correctly <u>Sample answer</u></p> <p>1. Plant P have more leaf compare to plant Q 2. Plant Q have less leaf compare to plant P</p> <p>3d</p> <p>Able to state one inference that can be made based on the observation correctly <u>Sample answer</u></p> <p>1. Plant P have more leaf because of the complete nutrient in the culture solution 2. Plant Q have less leaf because of lack nitrogen in the culture solution</p> <p>Able to define operationally the term “plant growth” correctly <u>Sample answer</u></p> <p>1. Plant growth is the increase number of leaves of the seedling P 2. Plant growth is more number of leaves of seedling P.</p> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> | | |
| | JUMLAH | | 5 |
| | | | |

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|---------------------|--|---------------------|-----------------|---|---|---|------------|--|--|--|--|----------|--|
| <p>4a</p> | <p>Able to measure the length of all section of the ticker tape correctly</p> <table border="1"> <tr> <td>Ticker tape section</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Length /cm</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Note: <i>Measurement must be made according to the real distance on the question paper. Answer cannot be given due to different size of paper used to print the question paper.</i></p> <p>3 – 4 measurement correct 2 marks 1 – 2 measurement correct 1 mark</p> | Ticker tape section | 1 | 2 | 3 | 4 | Length /cm | | | | | <p>2</p> | |
| Ticker tape section | 1 | 2 | 3 | 4 | | | | | | | | | |
| Length /cm | | | | | | | | | | | | | |
| <p>4b</p> | <p>Able to plot a graph correctly All point are transferred correctly – 1m Correct shape – 1m</p>  | <p>2</p> | | | | | | | | | | | |
| <p>4c</p> | <p>Able to state the type of movement correctly <u>Sample answer</u> Velocity increase</p> | <p>1</p> | | | | | | | | | | | |
| | <p>JUMLAH</p> | | <p>5</p> | | | | | | | | | | |

Section B
Bahagian B

| | | | |
|--------------|---|---|-----------|
| 5 (a) | <p>able to state gland J and M accurately <u>Answer</u></p> <p>J : Pituitary Gland / Kelenjar pituitari</p> <p>M : Adrenal gland / Kelenjar adrenal</p> | 1 | |
| | | 1 | |
| (b) | <p>Able to state how hormones traveled to the target organ correctly <u>Sample answer</u></p> <p>By the blood circulatory system <i>Melalui sistem pengaliran darah</i></p> | 1 | |
| (c) | <p>Able to state the function of hormone secreted by gland N correctly <u>Sample answer</u></p> <p>1. To control the development of secondary male sex characteristics 2. To control the production of sperm</p> | 1 | |
| (d) | <p>Able to state what will happened to the man if gland K secrete less hormone, correctly <u>Sample answer</u></p> <p>1. Low metabolic rate 2. Cretinism (children) 3. Goiter</p> | 1 | |
| (e) | <p>Able to state the effect if gland L is remove, correctly <u>Sample answer</u></p> <p>1. The glucose level in blood will increase 2. The man will have diabetes</p> | 1 | |
| | JUMLAH | | 6M |

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| <p>6(a)</p> | <p>Able to name the particle X accurately <u>Answer</u> Neutron / Neutron</p> | <p>1</p> | |
| <p>(b)</p> | <p>Able to state the proton and nucleon number accurately <u>Answer</u> (i) proton number = 4 (ii) nucleon number = 8</p> | <p>2</p> | |
| <p>(c)(i)</p> | <p>Able to state the correct pairs of isotopes accurately <u>Answer</u> P and Q</p> | <p>1</p> | |
| <p>(c)(ii)</p> | <p>Able to state the reason correctly <u>Sample answer</u> Atom P and Q have the same number of proton but different nucleon number</p> | <p>1</p> | |
| <p>(d)</p> | <p>Able to state the number of neutron in the atom accurately <u>Answer</u> 8</p> | <p>1</p> | |
| <p style="text-align: right;">JUMLAH</p> | | | <p>6M</p> |

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|---------------|---|---|-----------|
| 7 (a)(i) | <p>Able to name the substance X which can thinning the ozone layer correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. CFC 2. Chlorofluorocarbon | 1 | |
| (a)(ii) | <p>Able to name the appliance that use substance X correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Refrigerator 2. Air conditioner 3. Aerosol | 1 | |
| (b)(i) | <p>Able to name the radiation Y absorbed by ozone layer correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Ultraviolet 2. UV | 1 | |
| (b)(ii) | <p>Able to state two effect of radiation Y on human correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Cataract (eye disease) 2. Skin cancer 3. Damaging the human immune system | 2 | |
| (c) | <p>Able to state one step to prevent the thinning of ozone layer correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Find other alternatives to replace CFC. 2. Reduce the usage of CFC | 1 | |
| JUMLAH | | | 6M |

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| <p>8(a)</p> | <p>Able to write at least 3 information correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Food ingredients 2. Name of the food 3. Expired date 4. Weight or volume 5. Name and address of the factory | <p>3</p> | |
| <p>(b)(i)</p> | <p>Able to state the most important information correctly <u>Sample answer</u></p> <p>Expired date</p> | <p>1</p> | |
| <p>(b)(ii)</p> | <p>Able to state the related reason correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. To prevent from food poisoning 2. To avoid buying unhealthy food | <p>1</p> | |
| <p>(c)</p> | <p>Able to state one effect correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Obesity 2. Diabetes | <p>1</p> | |
| JUMLAH | | | 6M |
| <p>9(a)</p> | <p>Able to state the name of device accurately <u>Answer</u></p> <p>Microphone</p> | <p>1</p> | |
| <p>(b)(i)</p> | <p>Able to state the name of component X accurately <u>Answer</u></p> <p>Oscillator</p> | <p>1</p> | |
| <p>(b)(ii)</p> | <p>Able to name the wave correctly <u>Sample answer</u></p> <p>Radio waves</p> | <p>1</p> | |

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| <p>(c)</p> | <p>Able to state the type of modulated wave correctly <u>Sample answer</u></p> <p>1. AM 2. Amplitude modulation</p> | <p>1</p> | |
| <p>(d)(i)</p> | <p>Able to name the electronic component accurately <u>Answer</u></p> <p>Transistor</p> | <p>1</p> | |
| <p>(d)(ii)</p> | <p>Able to state the function of the named electronic component correctly <u>Sample answer</u></p> <p>1. Amplify a current 2. Switching 3. Voltage stabilization 4. Signal modulation</p> | <p>1</p> | |
| JUMLAH | | | 6M |
| SECTION C | | | |
| <p>10 (a)</p> | <p>Able to show the relationship between manipulated variable and the responding variable correctly. <u>Sample answer</u></p> <p>1. Optimum temperature will promote optimum growth of microorganism. 2. Most suitable temperature for the growth of bacteria is about 37 °C 3. Low temperature will not promote optimum growth</p> | <p>1</p> | <p>1</p> |
| <p>(b) (i)</p> | <p>Able to write the aim of the experiment correctly <u>Sample answer</u></p> <p>1. to study the effect of temperature on bacterial growth 2. to investigate the effect of temperature on bacterial growth</p> | <p>1</p> | <p>1</p> |

| <p>(b) (ii)</p> | <p>Able to identify the variables correctly <u>Sample answer</u></p> <p><i>Manipulated variable</i> 1. temperature</p> <p><i>Constant variable</i> 1. the volume of nutrient broth 2. the quantity of bacteria used</p> <p><i>Responding variable</i> 1. bacterial growth / condition of nutrient broth</p> <p style="text-align: right;">(any 2 variable)</p> | 2 | | | | | | | | | | | | | |
|------------------|--|-----------------------|-------------|--------------------|---|----------------------|--|---|-------------------|--|---|--------------|--|---|---|
| <p>(b) (iii)</p> | <p>Able to list the functional apparatus and materials to be used in the experiment correctly <u>Sample answer</u></p> <p>Three sterile test tubes, nutrient broth, bacteria culture solution, syringe, incubator, refrigerator and sterile cotton wool.</p> | 1 | 1 | | | | | | | | | | | | |
| <p>(b)(iv)</p> | <p>Able to write the procedure for the experiment correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. 3 cm³ of nutrient broth are poured into test tubes A, B and C. 2. Using syringe add 1 cm³ of bacteria culture into all three test tubes and cover the mouth of test tubes with sterile cotton wool. 3. Put test tube A in a refrigerator (10 °C), test tube B in an incubator (37 °C) and test tube C in an oven (50 °C) 4. After 2 days observe the condition of nutrient broth. | 4 1 1 1 1 | 4 | | | | | | | | | | | | |
| <p>(b)(v)</p> | <p>Able to draw the table correctly <u>Sample answer</u></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Test tube</th> <th>Temperature</th> <th>Condition of broth</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Refrigerator (10 °C)</td> <td></td> </tr> <tr> <td>B</td> <td>Incubator (37 °C)</td> <td></td> </tr> <tr> <td>C</td> <td>Oven (50 °C)</td> <td></td> </tr> </tbody> </table> <p style="text-align: right;">JUMLAH</p> | Test tube | Temperature | Condition of broth | A | Refrigerator (10 °C) | | B | Incubator (37 °C) | | C | Oven (50 °C) | | 1 | 1 |
| Test tube | Temperature | Condition of broth | | | | | | | | | | | | | |
| A | Refrigerator (10 °C) | | | | | | | | | | | | | | |
| B | Incubator (37 °C) | | | | | | | | | | | | | | |
| C | Oven (50 °C) | | | | | | | | | | | | | | |
| | | | 10 | | | | | | | | | | | | |

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| <p>11(a)</p> | <p>Able to choose two examples of alloy and state the main element in it and its uses correctly. <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Steel The main element is iron Uses: as material in making structure of building // Making vehicle / bridges / machine 2. Pewter The main element is Tin Uses: Ornaments // Mugs 3. Brass The main element is Copper Uses: Musical instruments // Ornaments // Bells 4. Bronze The main element is Copper Uses: Medals // Swords // Statues 5. Duralumin The main element is Aluminum Uses: Aircraft bodies // Bullet trains <p style="text-align: right;">(any two alloys)</p> | <p>1 1 1 1 1 1</p> | <p>4</p> |
| <p>11(b)</p> | <p>Able to state the aim of choice correctly <u>Sample answer</u></p> <p>To choose the best nail (<i>for making furniture using hard wood</i>)</p> <p>Able to explain the hardness of each type of nail based on its atomic structure correctly</p> <ol style="list-style-type: none"> 1. Iron nail is made up of pure iron. Its atoms were arranged in layers. When forces were applied to the iron the layers of atom will slide. 2. Copper nail is made up of pure copper. Its atoms were arranged in layers. When forces were applied to the copper the layers of atom will slide. 3. Steel nail is made up of iron and carbon. The iron atom cannot slide when force is applied to it because carbon atom stop iron atom from sliding. | <p>1 3</p> | <p></p> |

| 12(a) | <p>Able to list the nail according to its hardness correctly <u>Sample answer</u></p> <p>1. Steel nail, iron nail, copper nail 2. Steel nail, copper nail, iron nail</p> | 1 | 6 10M | | | | | | | | | | |
|--|--|--|--------------|--|--|--|---|---|--|---|--|--|---|
| | <p>Able to state the reason for the choice correctly <u>Sample answer</u></p> <p>1. Steel nail is the hardest and it will penetrate into the hard wood easily. 2. Steel nail can be use to nail into hard wood.</p> | 1 | | | | | | | | | | | |
| | JUMLAH | 1 | | | | | | | | | | | |
| | <p>Able to state two differences between saturated fat and unsaturated fats correctly. <u>Sample answer</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Saturated fats <i>Lemak tepu</i></th> <th style="text-align: center;">Unsaturated fats <i>Lemak tak tepu</i></th> </tr> </thead> <tbody> <tr> <td>Originated from animal <i>Berasal daripada haiwan</i></td> <td>Originated from plants <i>Berasal daripada tumbuhan</i></td> </tr> <tr> <td>Solid at room temperature <i>Pepejal pada suhu bilik</i></td> <td>Liquid at room temperature <i>Cecair pada suhu bilik</i></td> </tr> <tr> <td>Cannot add hydrogen atoms <i>Tidak boleh tambah atom hidrogen</i></td> <td>May add hydrogen atoms <i>Boleh tambah atom hidrogen</i></td> </tr> <tr> <td>Contain more cholesterol <i>Mengandungi banyak kolesterol</i></td> <td>Contain less cholesterol <i>Mengandungi kurang kolesterol</i></td> </tr> <tr> <td>Higher melting point <i>Takat lebur lebih tinggi</i></td> <td>Lower melting point <i>Takat lebur lebih rendah</i></td> </tr> </tbody> </table> <p style="text-align: center;">(Any two differences)</p> | Saturated fats <i>Lemak tepu</i> | | Unsaturated fats <i>Lemak tak tepu</i> | Originated from animal <i>Berasal daripada haiwan</i> | Originated from plants <i>Berasal daripada tumbuhan</i> | Solid at room temperature <i>Pepejal pada suhu bilik</i> | Liquid at room temperature <i>Cecair pada suhu bilik</i> | Cannot add hydrogen atoms <i>Tidak boleh tambah atom hidrogen</i> | May add hydrogen atoms <i>Boleh tambah atom hidrogen</i> | Contain more cholesterol <i>Mengandungi banyak kolesterol</i> | Contain less cholesterol <i>Mengandungi kurang kolesterol</i> | Higher melting point <i>Takat lebur lebih tinggi</i> |
| Saturated fats <i>Lemak tepu</i> | Unsaturated fats <i>Lemak tak tepu</i> | | | | | | | | | | | | |
| Originated from animal <i>Berasal daripada haiwan</i> | Originated from plants <i>Berasal daripada tumbuhan</i> | | | | | | | | | | | | |
| Solid at room temperature <i>Pepejal pada suhu bilik</i> | Liquid at room temperature <i>Cecair pada suhu bilik</i> | | | | | | | | | | | | |
| Cannot add hydrogen atoms <i>Tidak boleh tambah atom hidrogen</i> | May add hydrogen atoms <i>Boleh tambah atom hidrogen</i> | | | | | | | | | | | | |
| Contain more cholesterol <i>Mengandungi banyak kolesterol</i> | Contain less cholesterol <i>Mengandungi kurang kolesterol</i> | | | | | | | | | | | | |
| Higher melting point <i>Takat lebur lebih tinggi</i> | Lower melting point <i>Takat lebur lebih rendah</i> | | | | | | | | | | | | |
| | | | 1 | | | | | | | | | | |

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| 12(b) | <p>Able to state one example of saturated fat and unsaturated fat correctly. <u>Sample answer for saturated fats</u></p> <ol style="list-style-type: none"> 1. Fats from animal 2. Butter <p><u>Sample answer for unsaturated fats</u></p> <ol style="list-style-type: none"> 1. Oil from plant 2. Palm oil 3. Corn oil 4. Sunflower oil 5. Palmolive oil | 2 | 1 |
| | <p>Able to state two common characteristics correctly <u>Sample answer</u></p> <ol style="list-style-type: none"> 1. Contain carbon – hydrogen bond <i>Mengandung ikatan karbon - hidrogen</i> 2. Originated from living things <i>Berasal daripada benda hidup</i> 3. Contain carbon atoms <i>Mengandung atom karbon</i> | 2 | 1 |
| | <p>Able to relate two common characteristics to construct the initial concept correctly <u>Sample answer</u></p> <p>The chemical compound that contains carbon atoms, with carbon – hydrogen bond and originated from living things is organic compound.</p> <p><i>Sebatian kimia yang mengandungi atom karbon dengan ikatan karbon – hydrogen dan berasal daripada benda hidup ialah sebatian organik</i></p> | 1 | 4 |
| | <p>Able to state one example of organic compound and one inorganic compound correctly <u>Sample answer for organic compound</u></p> <ol style="list-style-type: none"> 1. Protein 2. Fats 3. Carbohydrates 4. Vitamin 5. Wood <p>(Other suitable example are acceptable)</p> <p style="text-align: right;">(any one answer)</p> | 2 | 1 |

