

**Roll Number**

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*Candidates must write the Set No. on the title page of the answer book.*

**DAV PUBLICSCHOOLS, ODISHA ZONE  
PERIODIC ASSESSMENT - II (2023 -24)**

- Please check that this question paper contains **10** printed pages.
- Set number given on the right hand side of the question paper should be written on the title page of the answer book by the candidate.
- Check that this question paper contains 39 questions.
- Write down the Serial Number of the question in the left side of the margin before attempting it.
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed 15 minutes prior to the commencement of the examination. The students will read the question paper only and will not write any answer on the answer script during this period.

**CLASS – X**

**SUBJECT – SCIENCE (086)**

**Max. Marks: 80**

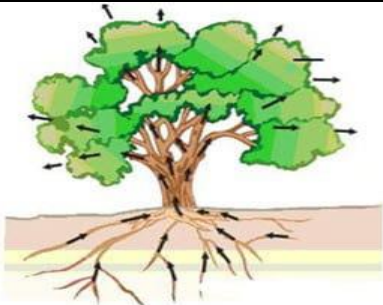
**Time Allowed: 3Hours**

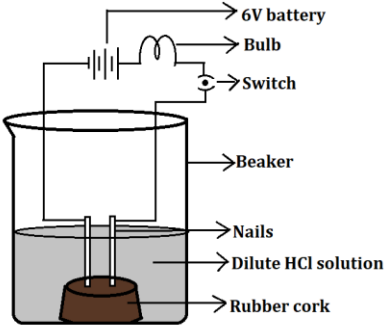
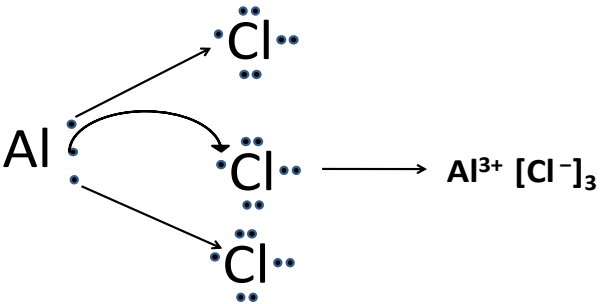
**General Instructions:**

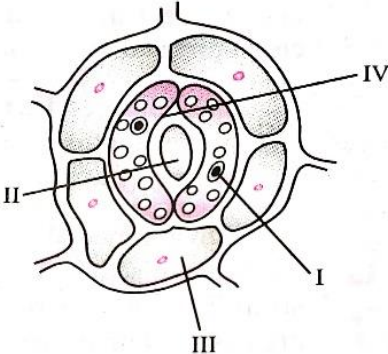
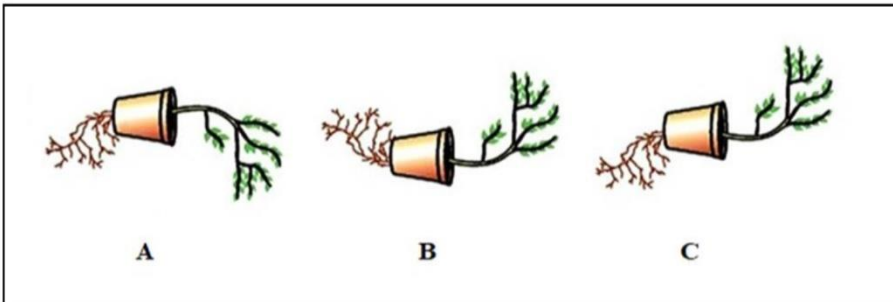
- This question paper consists of 39 questions in 5 sections.*
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*
- Section A consists of 20 objective type questions carrying 1 mark each.*
- Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.*
- Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.*
- Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.*
- Section E consists of 3 Source-Based/ Case-Based units of assessment of 04 marks each with sub-parts.*

### SECTION:-A

Select and write the most appropriate option out of the four options given for each of the questions 1 – 20. There is no negative mark for incorrect response.

1	Which of the following pair is incorrect? (a) Gibberellin - Elongation of stem (b) Auxin - Wilting of leaves (c) Cytokinin- Cell division (d) Absciscic acid- Closing of stomata	1
2	What happens, when a solution of an acid is mixed with a solution of a base in a test tube? (i) Temperature of the solution decreases (ii) Temperature of the solution increases (iii) Temperature of the solution remains the same (iv) Salt formation takes place  (a) (i) and (iv) (b) (i) and (iii) (c) (ii) only (d) (ii) and (iv)	1
3	What does the picture depict?   i. Absorption of water from soil ii. Transport of water and mineral from the soil iii. Loss of water from leaf surface by transpiration iv. Preparation of food by photosynthesis  (a) (i) and (ii) (b) (ii) and (iii) (c) (i), (ii) and (iii) (d) (ii), (iii) and (iv)	1
4	Which is the correct sequence of the components of a reflex arc? (a) Receptors→ muscles→ sensory neuron→ motor neuron →spinal cord (b) Receptors→ motor neuron→ spinal cord →sensory neuron→ muscles (c) Receptors→ spinal cord→ sensory neuron→ motor neuron→ muscles (d) Receptors →sensory neuron→ spinal cord →motor neuron→ muscles	1

5	<p>Except dilute HCl, in presence of which of the following substance bulb will glow</p> <p>(a) Sugar (b) Alcohol (c) Glucose (d) Caustic soda</p>		1
6	<p>Generally metals react with acids to give salt and hydrogen gas. Name the acid that does not give hydrogen gas on reacting with metals except Mn and Mg.</p> <p>(a) dil.H<sub>2</sub>SO<sub>4</sub> (b) dil.H<sub>3</sub>PO<sub>4</sub> (c) dil.HCl (d) dil.HNO<sub>3</sub></p>		1
7	<p>A substance 'X' is used in white-washing and is obtained by heating limestone in the absence of air. Identify 'X'.</p> <p>(a) CaOCl<sub>2</sub> (b) CaH<sub>2</sub> (c) CaO (d) CaCO<sub>3</sub></p>		1
8	<p>The compound formed AlCl<sub>3</sub>, is expected to have</p> <p>(a) High melting point (b) Low melting point (c) Melt at room temperature (d) None of the above</p>		1
9	<p>From the following salts, which has no water of crystallization?</p> <p>(a) Blue vitriol (b) Washing soda (c) Baking soda (d) Gypsum</p>		1
10	<p>Calcium oxide reacts vigorously with water to produce slaked lime.</p> $\text{CaO}_{(s)} + \text{H}_2\text{O}_{(l)} \rightarrow \text{Ca}(\text{OH})_{2(aq)}$ <p>This reaction can be classified as</p> <p>(i) Combination reaction (ii) Exothermic reaction (iii) Endothermic reaction (iv) Oxidation reaction</p>		1

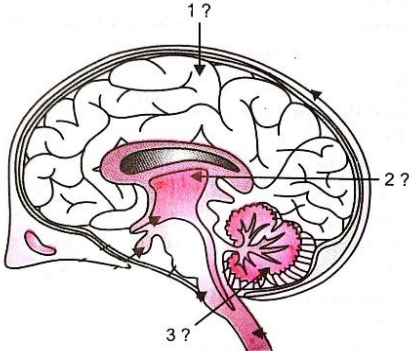
	<p>Which of the following is not a correct option?</p> <p>(a) (i)  (b) (ii)  (c) (i) and (ii)  (d) (iii) and (iv)</p>	
11	<p>A student, after examining temporary mount of epidermal leaf peel has drawn the following diagram and labelled I to IV parts. Choose the correct option.</p>  <p>(a) I-Nucleus, II-Guard cell, III-Stomatal pore, IV- Epidermal cell  (b) I-Guard cell, II- Stomatal pore, III-Chloroplast, IV-Epidermal cell  (c) I-Nucleus, II-Stomatal pore, III-Epidermal cell, IV-Guard cell  (d) I-Epidermal cell, II-Stomatal pore, III- Guard cell, IV- Chloroplast</p>	1
12	<p>Observe the three figures given below. Which of the following depicts tropic movements appropriately?</p>  <p>(a) B and C  (b) A and C  (c) B only  (d) C only</p>	1
13	<p>What happens to the image distance from the eye lens in a normal eye, when we increase the distance of an object?</p> <p>(a) Increases  (b) Decreases  (c) Remain unchanged  (d) Depend on the size of the eye ball.</p>	1
14	<p>What is the correct direction of flow of electrical impulses?</p>	1

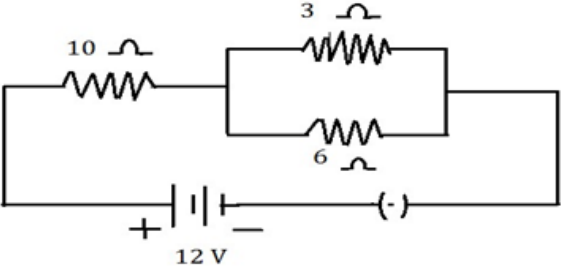
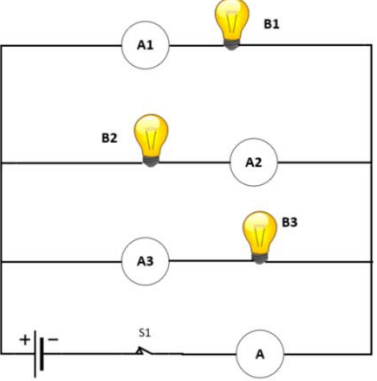
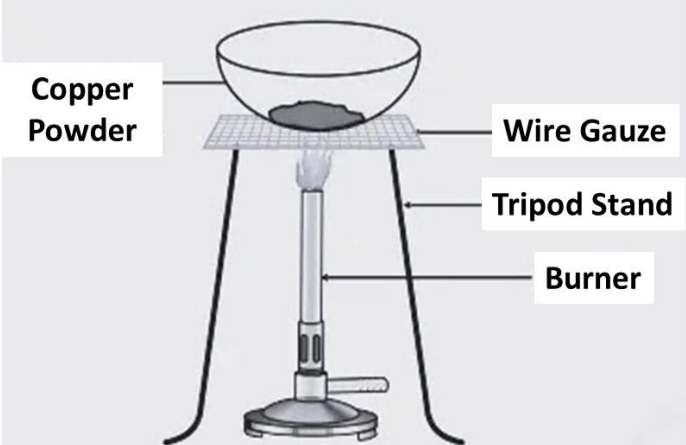
15	<p>A student plots V-I graphs for three nichrome wires with resistances <math>R_1</math>, <math>R_2</math> and <math>R_3</math>. Choose the correct options that holds true for this following graph.</p> <p>(a) <math>R_1 = R_2 = R_3</math>            (b) <math>R_1 &gt; R_2 &gt; R_3</math>            (c) <math>R_3 &gt; R_2 &gt; R_1</math>            (d) <math>R_2 &gt; R_1 &gt; R_3</math></p>	1
16	<p>Which one of the following statements is correct regarding the cells, transporting water and minerals &amp; food?</p> <p>(a) Sieve tubes transport water and minerals &amp; companion cells transport food            (b) Tracheids transport water and minerals &amp; sieve tubes transport food            (c) Companion cells transport water and minerals &amp; vessels transport food            (d) Vessels transport water and minerals &amp; tracheids transport food</p>	1
<p>Question No. 17-20 consist of two statements- Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>a. Both Assertion (A) and Reason(R) are true and the Reason is the correct explanation of the Assertion.            b. Both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion.            c. Assertion is true but the Reason is false.            d. Assertion is false but the Reason is true.</p>		
17	<p><b>Assertion (A):</b>When a wire is stretched to three times of its original length, its resistance becomes 3 times.  <b>Reason (R) :</b>Resistance is directly proportional to length of wire.</p>	1
18	<p><b>Assertion (A) :</b>Many dramatic changes are observed in appearance of boys and girls at the age of 10 to 12.  <b>Reason (R) :</b>Estrogen in boys and testosterone in girls are responsible for the changes associated with puberty.</p>	1
19	<p><b>Assertion (A):</b>Aluminum easily displace copper on reacting with a solution of Coppersulphate.  <b>Reason (R):</b>Copper is more reactive metal as compared to aluminum</p>	1
20	<p><b>Assertion (A) :</b>During photosynthesis, light energy is converted into chemical energy.  <b>Reason(R):</b>There is reduction of carbon dioxide to form carbohydrates.</p>	1

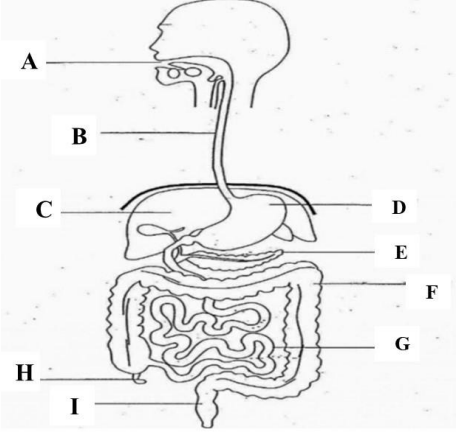
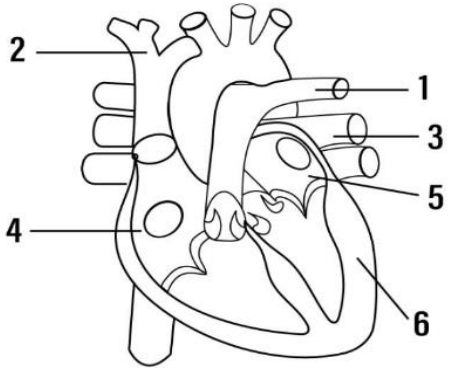
**SECTION: -B****Question No. 21 to 26 are very short answer questions.**

21	A concave mirror produces three times magnified real image of an object placed at 10cm in front of it. Find where the image is formed?  OR A convex lens has focal length of 20 cm. At what distance from the lens should the object be placed so that the image is formed at 40 cm on the other side of the lens? Also state the nature of the image formed.	2
22	Name the plant hormone that promotes the growth of a tendril around a support. Explain the mechanism.  OR Name the mechanism that controls the timing and amount of hormone released. Explain it with the help of a suitable example.	2
23	Name the hormone that enables our body to deal with emergency situation. How does our body respond when it is secreted into the blood?	2
24	400 J of heat is produced in 4s in a $4\ \Omega$ resistor. Find potential difference across the resistor.	2
25	2g of ferrous sulphate crystals are heated strongly in a dry boiling tube. State any two observations for the reaction and also write the balanced chemical equation for it.	2
26	Give reason for the following (a) Rate of breathing in aquatic organisms is much faster than that in terrestrial organisms. (b) Haemoglobin transports oxygen but carbon dioxide is transported in dissolved form in our blood.	2

**SECTION: -C****Question No. 27 to 33 are short answer questions.**

27	(a) Study the given diagram of brain and label the part 1 and 3. (b) Write two points of differences between 1 and 3.	1 2
		
28	(a) Write two causes of hypermetropia. (b) Draw the diagram for each (i) hypermetropic eye (ii) its correction using suitable optical device.	3
29	(a) Sometimes pyruvate is broken down in lack or absence of oxygen to release energy. Explain two such ways of releasing energy. (b) Where does this process take place? Why is less amount of energy released during these processes?	3

30	<p>You have given three lenses <math>L_1</math>, <math>L_2</math> and <math>L_3</math> of power + 10 D, +5 D and – 10 D respectively. State the nature and focal length of each lens. Explain which lens will form a virtual and magnified image of an object when placed at 15 cm from the lens.</p>	3
31	<p>For the circuit shown in this diagram, calculate</p> <p>(a) the total resistance of the circuit  (b) the total current flowing through the circuit  (c) the potential difference across 10 <math>\Omega</math> resistor .</p> <div style="text-align: center;">  </div> <p style="text-align: center;">OR</p> <p><math>B_1</math>, <math>B_2</math> and <math>B_3</math> are three identical bulbs connected as shown in figure given. When all the three bulbs glow, a current of 6 A is recorded by the ammeter A at a potential difference 12 volt.</p> <p>(a) What happens to the glow of the other two bulbs when the bulb <math>B_1</math> gets fused? Give justification for your answer.  (b) Write the reading of <math>A_2</math>, <math>A_3</math> and A when the bulb <math>B_1</math> gets fused.  (c) Calculate the power dissipated in the circuit when  (i) all the three bulbs glow together and  (ii) when the bulb <math>B_1</math> gets fused.</p> <div style="text-align: right;">  </div>	3
32	<p>(a) Why sodium is kept immersed in kerosene oil?  (b) Give reason why platinum, gold and silver are used to make jewellery?  (c) Name a metal and non-metal which exist in liquid form.</p>	3
33	<div style="text-align: center;">  </div> <p>(a) Name the type of reaction taking place in above diagram.  (b) Write chemical equation involved in the above reaction.  (c) How can you get back brown copper powder after formation of the product?</p>	3

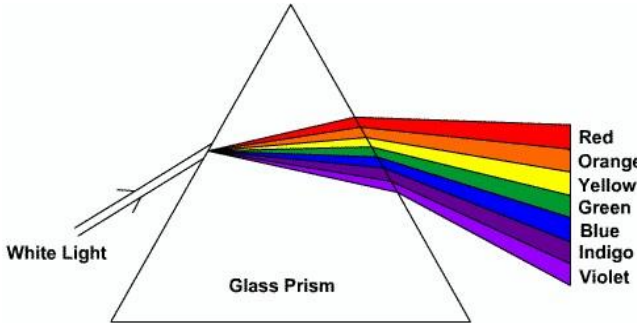
	<p>OR</p> <p>Write the chemical equation of the reaction in which the following changes have taken place with an example of each:</p> <p>(a) Change in colour  (b) Change in temperature  (c) Formation of precipitate.</p>	
<p><b>SECTION: -D</b></p> <p><b>Question No. 34 to 36 are Long Answer Questions.</b></p>		
34	<p>(a) Draw the circuit diagram consisting of battery of four cells of 2V each, a plug key, an ammeter and a set of resistors having resistances <math>2\ \Omega</math>, <math>4\ \Omega</math> and <math>6\ \Omega</math>, which are connected in series. Also connect a voltmeter across <math>6\ \Omega</math> resistor.</p> <p>(b) Find the current flowing in the circuit.</p> <p>(c) Find the potential difference across <math>6\ \Omega</math> resistor.</p> <p style="text-align: center;">OR</p> <p>A house hold circuit uses the following electric appliances</p> <p>(a) A Refrigerator of rating 400 W for ten hours per day.  (b) Two electric fans of rating 80W each for 12 hours per day.  (c) Six electric tube lights of rating 18 W each for 6 hours per day.</p> <p>Calculate the electricity bill of the household circuit for the month of June, if the cost per unit of electric energy is Rs. 3.00.</p>	<p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p>
35	<p>Observe the diagram given below &amp; answer the following questions.</p> <p>(a) Identify the parts of digestive system that secrete the following enzymes &amp; name the substrate on which they act.</p> <p>(i) Lipase  (ii) Salivary amylase.</p> <p>(b) Although the juice secreted by 'C' has no digestive enzymes, it is still considered to be very important in digestion of food. Name the juice &amp; write its function in digestion.</p> <p>(c) How does protein digestion take place in stomach and small intestine?</p> <p style="text-align: center;">OR</p> <p>(a) Identify &amp; name the blood vessels that carry deoxygenated blood.</p> <p>(b) Ventricles have thicker elastic wall than atria. Give reason.</p> <p>(c) Name two groups of organisms in which oxygenated &amp; deoxygenated blood are separated. Mention the significance of such separation.</p>	<div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <p style="text-align: center; vertical-align: top;"> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p> <p>2</p> </p>

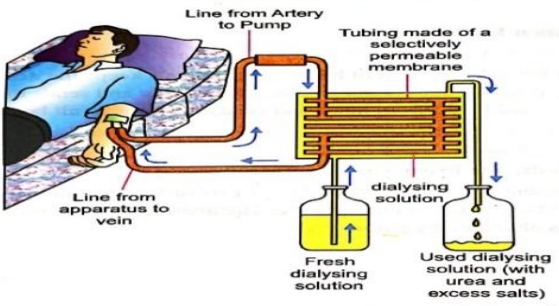


36	<p>(a) Dry pellets of a base 'X' when kept in open absorbs moisture and turns sticky. The compound is also formed by chlor-alkali process. Write chemical name and formula of X. Describe chlor-alkali process with balanced chemical equation. Name the type of reaction occurs when X is treated with dilute hydrochloric acid. Write the chemical equation.</p> <p>(b) While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?</p>	4 1
OR		
<p>A metal compound 'X' reacts with dil. <math>H_2SO_4</math> to produce effervescence. The gas evolved extinguishes a burning candle. If one of the compound formed is magnesium sulphate, then</p>		
(a) What is 'X' and the gas evolved? Also, write a balanced chemical equation for the reaction which occurred.		3
(b) (i) Name one antacid. How does it help to relieve indigestion in stomach?		2
(ii) A farmer treats the soil with quicklime or calcium carbonate. What is the nature of soil? Why does the farmer treat the soil with quicklime?		

**SECTION: -E**

**Question number 37 to 39 are case study-based/data based questions with 2 to 3 short sub parts. Internal choice is provided in one of these sub parts.**

37	<p>Refraction of light is the phenomenon of change in the direction of light, when it travels from one transparent medium to another medium. This change in direction is due to change in velocity of light in different media. In case of refraction of light through rectangular glass slab, we must observe that the incident ray is parallel to the emergent ray. There are various natural phenomenon associated with light, for example we can see the pencil immersed in water appears to be bent at the water air interface only because of refraction of light. Again second phenomenon is dispersion of light in which white light is passed through the prism and it splits into seven colour spectrum as shown in the figure. The seven colours are VIBGYOR. We can see here the angle of deviation is different for different colors because of different wavelength for different colours. The phenomenon of formation of rainbow is also because of the dispersion of light. In this case tiny water droplets acts as prism but it is important that the refraction of light occurs only because of change in refractive index of medium.</p>	
		
(a) For which colour, the angle of deviation is maximum in case of dispersion?		1
(b) Why white light splits into seven colours when it passes through a glass prism?		1
(c) Why atmospheric refraction occurs? Give an example.		2
OR		
Name the following, when a ray of light passes through a glass slab.		
(i) Angle between incident ray and normal.		
(ii) Perpendicular distance between incident ray and emergent ray.		

38	<p><b>Plaster of Paris</b>, quick-setting gypsum plaster consisting of a fine white powder, which hardens when moistened and allowed to dry. Known since ancient times, Plaster of Paris is so called because of its preparation from the abundant gypsum found near Paris. Plaster of Paris does not generally shrink or crack when dry, making it an excellent medium for casting molds. It is commonly used to precast and hold parts of ornamental plasterwork placed on ceilings and cornices. It is also used in medicine to make plaster casts to immobilize broken bones while they heal, though many modern orthopedic casts are made of fiber-glass or thermoplastics.</p> <p>(a) Write the chemical name and formula of Plaster of Paris.  (b) How can Plaster of Paris have half molecule of water of crystallization?  (c) Write the equation to prepare Plaster of Paris from gypsum. Mention the difference of water molecules in gypsum and Plaster of Paris.</p> <p style="text-align: center;">OR</p> <p>What is the colour of Plaster of Paris? Mention the property of Plaster of Paris for which it is used to support fractured bone.</p>	1 1 2
39	<p>The figure shown below represents Hemodialysis. This procedure helps the patients with kidney failure. During this process, the patient's blood is cleaned by filtration through a series of semi-permeable membranes before being return to the blood of the patient. On the basis of this answer the following questions:</p> <div style="text-align: center;">  </div> <p>(a) How is the function of natural kidney different from that of Hemodialysis?  (b) Mention the amount of initial filtrate formed by a healthy kidney. How does its volume reduce to 1 to 2 litres per day?  (c) Name any four major constituents present in initial filtrate.</p> <p style="text-align: center;">OR</p> <p>Mention two factors on which the amount of water reabsorption by kidney tubules depend.</p>	1 1 2