

**Modified Enlarged 24 pt**

**OXFORD CAMBRIDGE AND RSA  
EXAMINATIONS**

**Thursday 18 May 2023 – Morning**

**Level 3 Cambridge Technical in Sport and  
Physical Activity**

**05826/05827/05828/05829/05872**

**Unit 1: Body systems and the effects of  
physical activity**

**Time allowed: 1 hour 30 minutes plus your  
additional time allowance**

**You can use:  
a calculator**

**Please write clearly in black ink.**

**Centre  
number**

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**Candidate  
number**

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**First name(s)** \_\_\_\_\_

**Last name** \_\_\_\_\_

**Date of  
birth**

D	D	M	M	Y	Y	Y	Y
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**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS**

**Use black ink. You can use an HB pencil, but only for graphs and diagrams.**

**Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.**

**Answer ALL the questions.**

**Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.**

## **INFORMATION**

**The total mark for this paper is 70.**

**The marks for each question are shown in brackets [ ].**

**Quality of written communication will be assessed in questions marked with an asterisk (\*).**

## **ADVICE**

**Read each question carefully before you start your answer.**

**SECTION A**

**Put a tick (✓) in the box next to the ONE correct answer for each question.**

**1 Which one of the following is a typical resting value for minute ventilation? [1]**

**(a) 0.1 litres per minute**

☐

**(b) 0.6 litres per minute**

☐

**(c) 1 litre per minute**

☐

**(d) 6 litres per minute**

☐

**2 Which one of the following components of blood contains haemoglobin? [1]**

**(a) Plasma**

☐

**(b) Platelets**

☐

**(c) Red blood cells**

☐

**(d) White blood cells**

☐

**3 Which one of the following is NOT a long-term effect of exercise on the muscular system? [1]**

**(a) Hypertrophy of muscles**

☐

**(b) Increased muscular endurance**

☐

**(c) Increased tolerance to lactic acid**

☐

**(d) Reduced capillarisation**

☐

**4 Consider the following lung volumes:**

**A – Breathing frequency**

**B – Minute ventilation**

**C – Tidal volume**

**Which of these lung volumes increase during exercise? [1]**

**(a) A and B only**

☐

**(b) A and C only**

☐

**(c) B and C only**

☐

**(d) A, B and C**

☐

**5 Which one of the following pairs of muscles BOTH cause movement at the shoulder? [1]**

**(a) Deltoid and iliopsoas**

☐

**(b) Deltoid and pectoralis major**

☐

**(c) External oblique and pectoralis major**

☐

**(d) External oblique and iliopsoas**

☐

**6 Which one of the following valves is found between the right atrium and right ventricle? [1]**

**(a) Aortic valve**

☐

**(b) Bicuspid valve**

☐

**(c) Pulmonary valve**

☐

**(d) Tricuspid valve**

☐

**7 Which one of the following describes the function of the epiglottis? [1]**

**(a) Prevents food entering the lungs** ☐

**(b) Removes carbon dioxide** ☐

**(c) Site for gaseous exchange** ☐

**(d) Warms and moistens air** ☐

**8 State the technical name for the bones of the spine.**

\_\_\_\_\_ **[1]**

**9 Which energy system uses phosphocreatine as a fuel?**

\_\_\_\_\_ **[1]**

- 10 Calculate the heart rate of an individual with a stroke volume of 70 millilitres per beat and a cardiac output of 4900 millilitres per minute.**

**\_\_\_\_\_ (beats per minute) [1]**



**SECTION B**

**11 (a) Complete the following sentences, using the words below. [4]**

**cartilage                  levers                  ligaments**  
**organs                  strength                  tendons**

**Short bones are compact and are designed for weight-bearing and**

\_\_\_\_\_.

**Long bones act as**

\_\_\_\_\_ and

**are vital for movement.**

**Flat bones provide an attachment for muscles and often protect vital**

\_\_\_\_\_.

**Sesamoid bones are found in**

\_\_\_\_\_ and facilitate

**movement at a joint.**

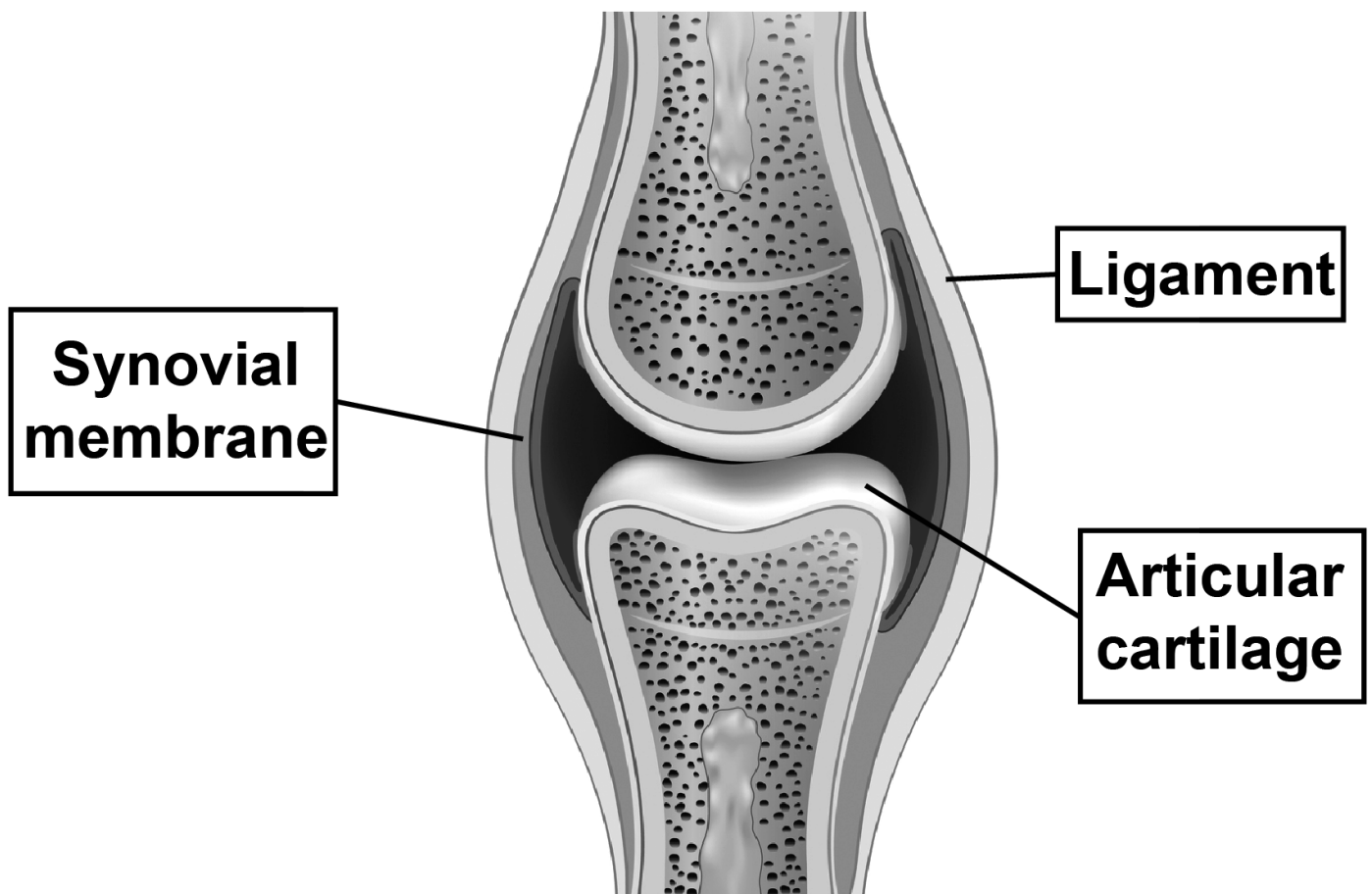
**(b) Name TWO bones of the axial skeleton, other than the bones of the spine.**

**1** \_\_\_\_\_

**2** \_\_\_\_\_

**[2]**

**12 The diagram shows a synovial joint with some structures labelled.**



**(a) Describe the function of each structure:**

**Articular cartilage**

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**Ligaments**

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**Synovial membrane**

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**[3]**

**(b) State THREE other structures that are found at a synovial joint.**

**1** 

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**2** 

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**3** 

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**[3]**

- 13 (a) Identify ONE structural characteristic and ONE function of fast glycolytic muscle fibres.**

**Structure** \_\_\_\_\_

**Function** \_\_\_\_\_

**[2]**

- (b) Name an athletics event that relies mainly on fast glycolytic muscle fibres for success.**

\_\_\_\_\_ **[1]**

**14 One effect of a cool-down on the muscular system is to increase the elasticity of muscle fibres.**

**Describe THREE other effects of a cool-down on the muscular system.**

**1**

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**2**

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**3**

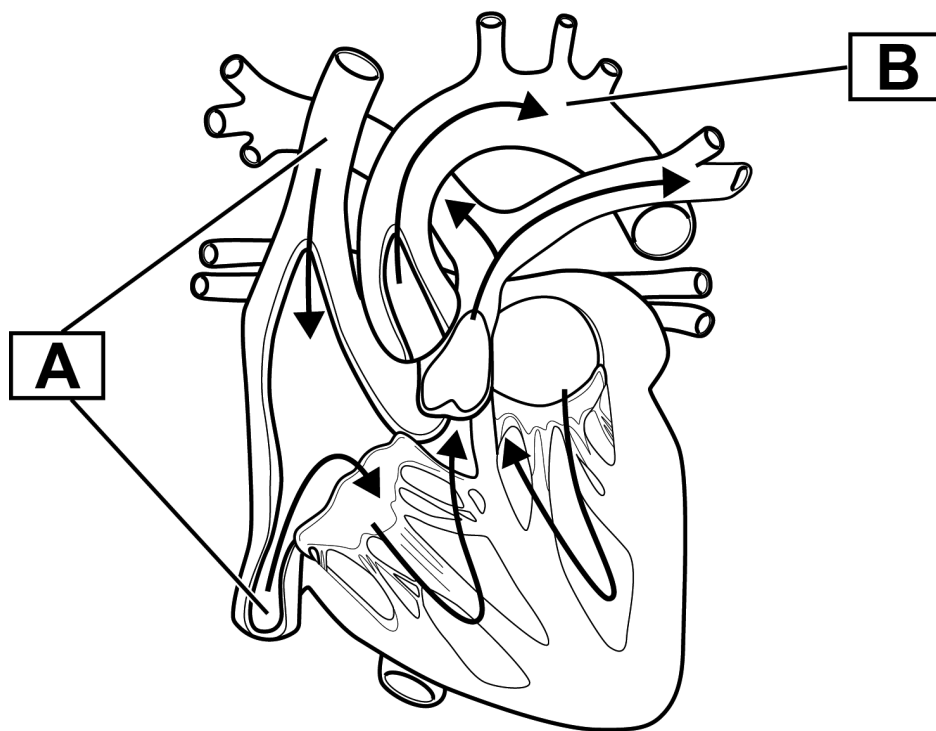
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**[3]**

- 15 FIG. 15 shows a diagram of the heart and the directional flow of blood through the heart.**

**FIG. 15**



- (a) Identify structures A and B and describe the function of each.**

**A** \_\_\_\_\_

**Function of A** \_\_\_\_\_

\_\_\_\_\_

**B** \_\_\_\_\_

**Function of B** \_\_\_\_\_

\_\_\_\_\_

**(b) Use FIG. 15 to explain how blood flows through the chambers and valves of the heart.**

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**[4]**

**16 Complete the sentences to explain the effects of a warm-up on the cardiovascular system. [5]**

**A warm-up increases venous return which leads to an increase in**

**\_\_\_\_\_ volume.**

**A warm-up initiates the**

**\_\_\_\_\_ mechanism, which increases blood flow to the \_\_\_\_\_ .**

**This is achieved by**

**\_\_\_\_\_ and**

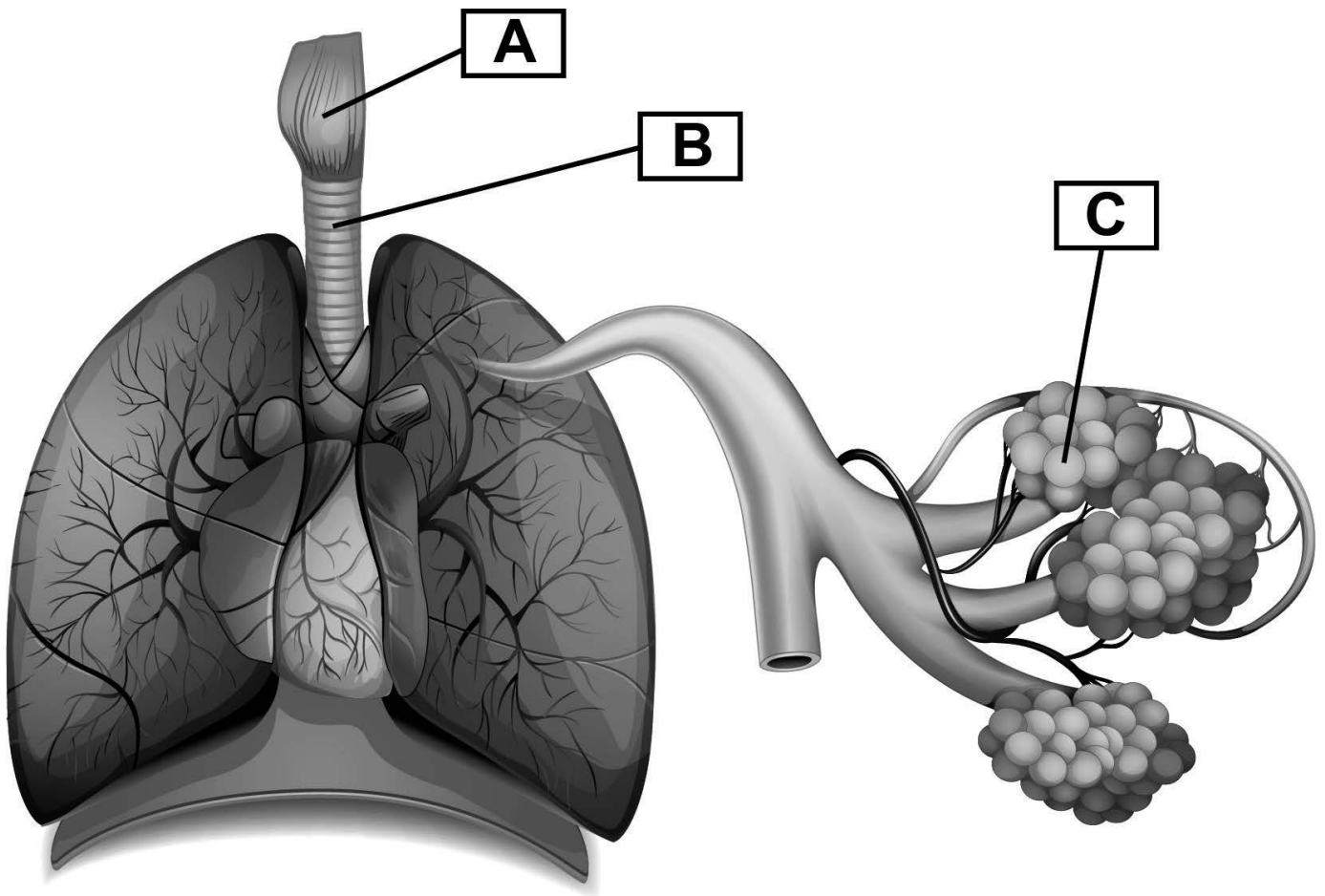
**vasoconstriction of blood vessels and pre-capillary sphincters. A warm-up also increases temperature which**

**\_\_\_\_\_ the**

**viscosity of blood.**



**17 The diagram shows the structures of the lungs.**



**Identify the structures labelled A, B and C.**

**A** \_\_\_\_\_

**B** \_\_\_\_\_

**C** \_\_\_\_\_

**[3]**

**18 (a) Name TWO respiratory muscles that contract during inspiration.**

**1** \_\_\_\_\_

**2** \_\_\_\_\_

**[2]**

**(b) Describe what happens to the following during inspiration:**

**Movement of the ribs**

\_\_\_\_\_

\_\_\_\_\_

**Volume of the thoracic cavity**

\_\_\_\_\_

\_\_\_\_\_

**Pressure in the lungs**

\_\_\_\_\_

\_\_\_\_\_

**[3]**

**(c) Explain how differences in partial pressures of gases enable gaseous exchange to occur in the lungs.**

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**[3]**

**19 Complete the table, using some of the words and numbers below, to describe the main energy system used during a marathon. [4]**

<b>aerobic</b>	<b>anaerobic</b>	<b>carbon dioxide</b>
<b>fats</b>	<b>minerals</b>	<b>oxygen</b>
<b>proteins</b>	<b>water</b>	<b>1</b>
<b>2</b>	<b>36+</b>	

<b>Type of reaction</b>	
<b>Food fuels</b>	<b>carbohydrates and</b>
<b>Amount of ATP produced</b>	
<b>By-products</b>	<b>and H<sub>2</sub>O</b>

**20 Complete the sentences to explain the recovery processes for the lactic acid system. [4]**

**During recovery lactic acid is converted back to \_\_\_\_\_ acid.**

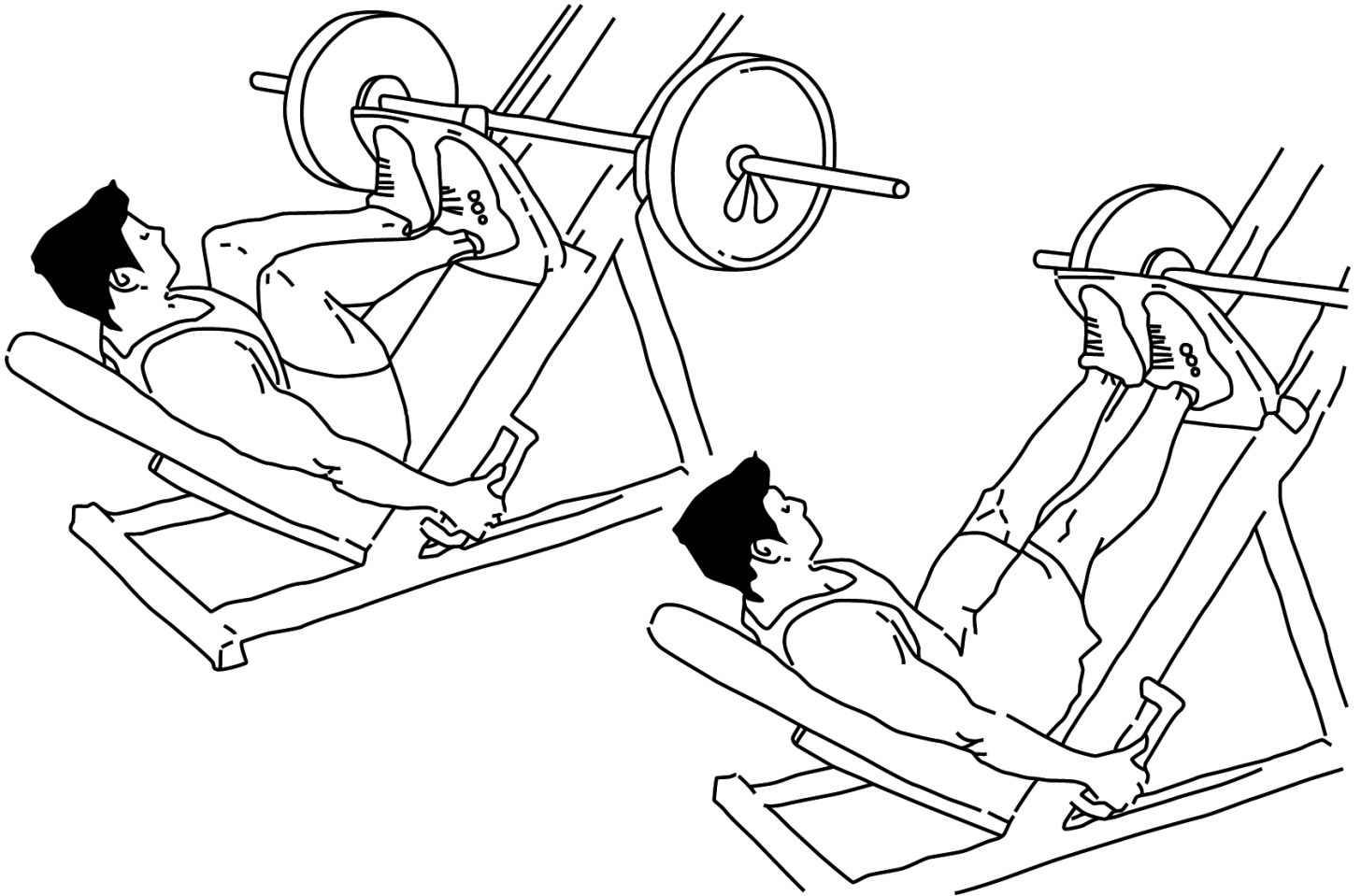
**This is then oxidised or converted into \_\_\_\_\_ .**

**Lactic acid removal generally takes about \_\_\_\_\_ , although it can take as much as 24 hours depending on intensity of work, fitness level and the recovery methods used.**

**One way to speed up the recovery process is to perform a \_\_\_\_\_ .**

**SECTION C**

**21\* The diagram shows the performance of a leg press exercise.**



**Analyse the movements of the knee joint during both phases of the leg press. [10]**

**Your answer should include:**

**type of joint**

**articulating bones**

**joint movements**

**main muscles acting**

**the functions of the muscles involved**

**types of muscle contraction.**

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**END OF QUESTION PAPER**

### ADDITIONAL ANSWER SPACE

**If additional answer space is required, you should use the following lined pages. The question numbers must be clearly shown in the margins – for example, 15(b) or 21\*.**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.





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