

Name .....

Index Number ..... / .....

Candidate's Signature .....

Date .....

232/2

PHYSICS

PAPER 2 (THEORY)

JULY/AUGUST 2013

TIME: 2HOURS

**LENOCET EVALUATION TEST**  
**KENYA CERTIFICATE OF SECONDARY EDUCATION**

232/2

PHYSICS

PAPER 2 (THEORY)

TIME: 2HOURS

**Instructions to candidates**

- a) Write your name and Index Number in the space provided above.
- b) Sign and write the date of examination in the spaces provided above.
- c) This paper consists of two sections **A** and **B**.
- d) Answer **ALL** the questions in section **A** and **B** in the spaces provided.
- e) All working must be clearly shown.
- f) Non-programmable silent electronic calculators and KNEC mathematical tables may be used.
- g) This paper consists of **11** printed pages.
- h) Candidates should check the question papers to ascertain that all the pages are printed as indicated and that no questions are missing.

**For Examiner's use only**

| Section     | Questions | Maximum Score | Candidate's |
|-------------|-----------|---------------|-------------|
| Score A     | 1 - 13    | 25            |             |
| B           | 14        | 12            |             |
|             | 15        | 11            |             |
|             | 16        | 12            |             |
|             | 17        | 10            |             |
|             | 18        | 10            |             |
| Total Score |           | 80            |             |

**SECTION A: 25 MARKS**

**Answer ALL the questions in this section in the spaces provided**

1. An object is placed in between two parallel mirrors. How many images can a student see?

(2marks)

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2. You have been provided with the following; a cell, a voltmeter, an ammeter, a variable resistor, two bulbs and connecting wires. Draw an electric circuit that may be used to control the current through, and the voltage across the bulbs when connected in;

(a) Series

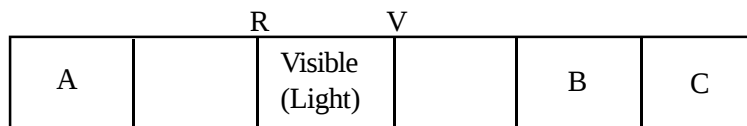
(2 marks)

(b) Parallel

(2 marks)

3. Figure 1 shows regions of the complete electromagnetic spectrum. Name the regions marked A, B and C.

(3 marks)



**Figure 1**

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4. In the setup in figure 2 a magnet is moved towards the coil and stopped when inside the coil.

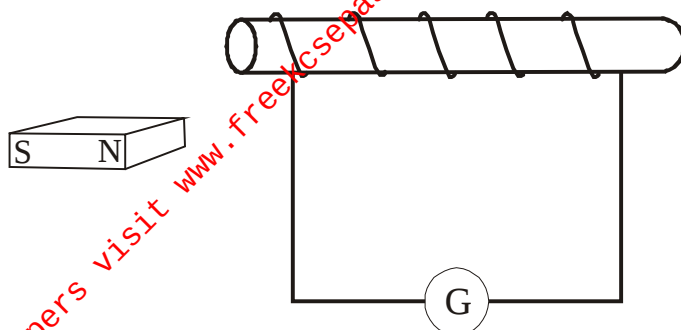


Figure 2

It is observed that the galvanometer deflects to one side and then goes back to zero. Explain this explanation.

(2 marks)

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5. Figure 3 shows an a.c signal connected to y plates of a C.R.O with time base on.

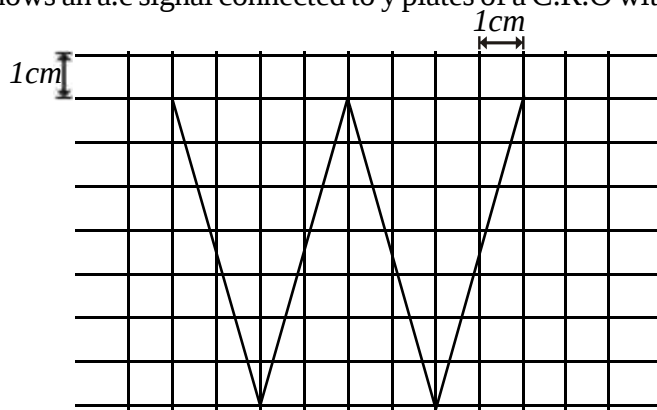


Figure 3

Given that the gain is at 150V/div, determine the peak voltage of the input signal.

(2 marks)

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6. Distinguish between transverse and longitudinal waves.

(1mark)

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7. Give **two** dangers associated with X - rays. (2 marks)

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8. Figure 4 below shows a hollow negatively charged sphere with a metal disc attached to an insulator placed inside.

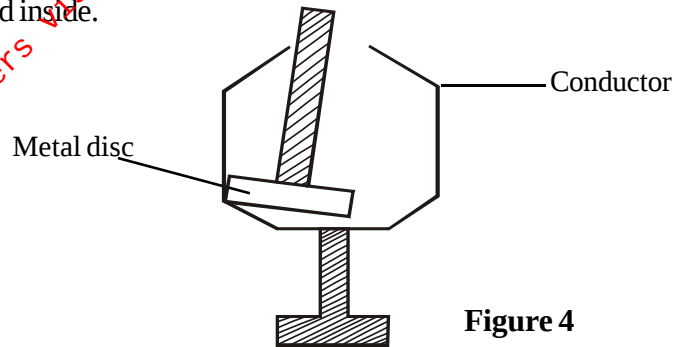


Figure 4

State what would happen to the leaf of uncharged electroscope if the metallic disc were brought near the cap of the electroscope. Give a reason for your answer. (2 marks)

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9. Figure 5 below shows a convex mirror. A ray is incident on the mirror to show the direction of the ray. Complete the diagram. (1 mark)

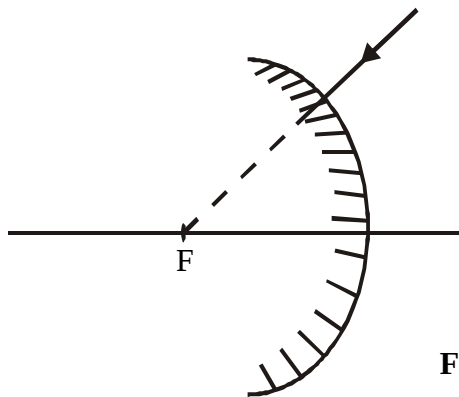


Figure 5

10. Sketch the magnetic field patterns in figure 6 below. (1 mark)



Figure 6

11. A ray of light is incident at a glass water interface as shown in figure 7. The angle  $i$  is less than the critical angle for the interface.

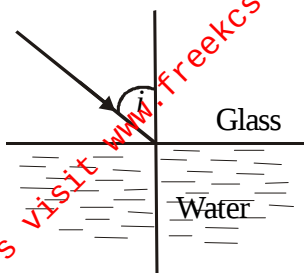


Figure 9

Complete the diagram above to show how the ray travels.

(1 mark)

12. An electric bulb is marked 45W, 240V. How much energy does it consume in four hours.

(2 marks)

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13. Given that the velocity of sound in air is 330m/s. Calculate the wavelength of sound produced by a tuning fork rated 440Hz.

(2 marks)

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**SECTION B (55 Marks)**  
**Answer ALL questions in the spaces provided**

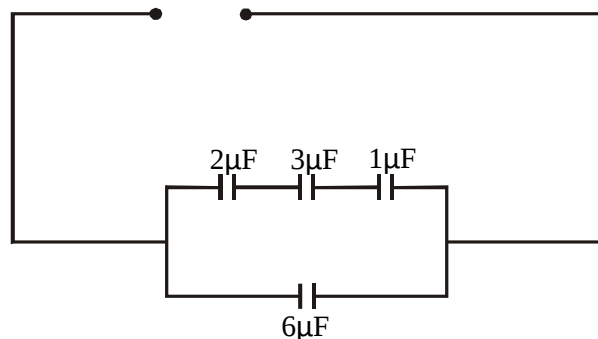
14. (a) (i) What is capacitance of a capacitor. (1 mark)

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(ii) State **two** factors that affects the capacitance of a parallel plate capacitor (2 marks)

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(iii) Figure 8 shows 4 capacitors conected as shown in the setup.



**Figure 8**

Calculate the effective capacitance of the setup shown in the diagram above. (3 marks)

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(b) A  $10\mu\text{F}$  capacitor is charged to a potential of 240V and then disconnected. The charged capacitor is then connected to a  $20\mu\text{F}$  capacitor. Calculate;

(i) The resultant potential difference. (3 marks)

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(ii) The energy stored by the  $10\mu\text{F}$  capacitor before connection to the  $20\mu\text{F}$  capacitor. (2 marks)

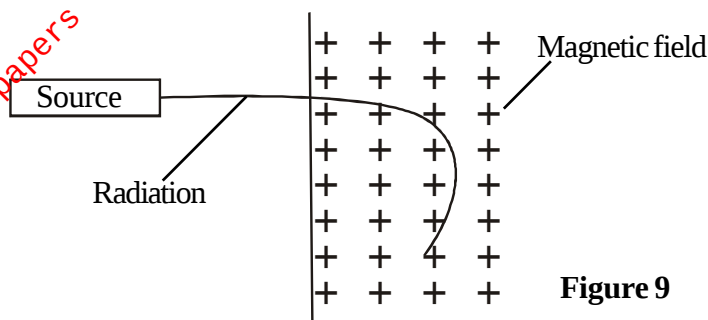
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(iii) State one application of capacitors.

(1 mark)

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15. (a) Figure 9 shows the path of radiation from a radioactive source after entering a magnetic field. The magnetic field is directed into the paper and is perpendicular to the plane of the paper as shown.

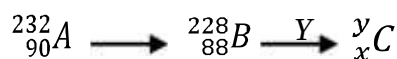


Identify the radiation. Give reason for your answer.

(2 marks)

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- (b) Below is a nuclear reaction.



- (i) Identify radiation K.

(1 mark)

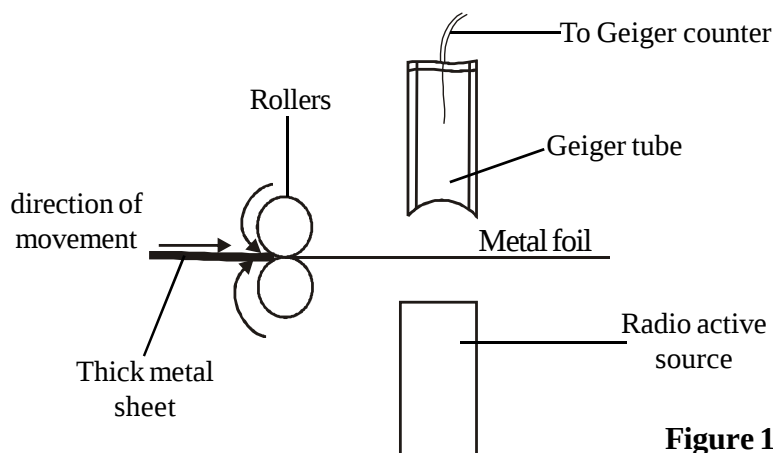
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- (ii) Determine the value of x and y.

(2 marks)

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- (c) Figure 10 shows a device for producing metal foils of constant thickness. Any change in the thickness can be detected by the GM counter. The pressure exerted by the other roller is then adjusted to keep the thickness constant.



- (i) State the change in metal foil that will lead to decrease in the Geiger counter reading. (1 mark)

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- (ii) Give reason for your answer in (i) above. (1 mark)

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- (iii) State the change in the roller pressure that should be made as a result of this decrease in the Geiger counter reading. (1 mark)

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- (iv) Give reason for your answer. (1 mark)

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- (v) Explain why a source emitting alpha particles would not be suitable for this device. (1 mark)

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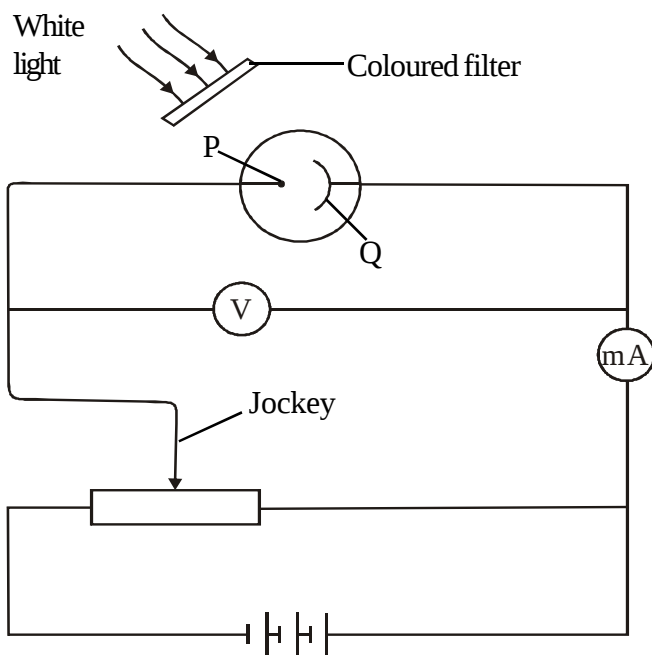
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16. (a) What is meant by the term photo-electric effect. (1 mark)

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- (b) Figure 11 shows an arrangement used to investigate photo-electric effect.



**Figure 11**

- (i) Name the parts marked P and Q. (2 marks)

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- (ii) State **three** measurable quantities in this setup. (3 marks)

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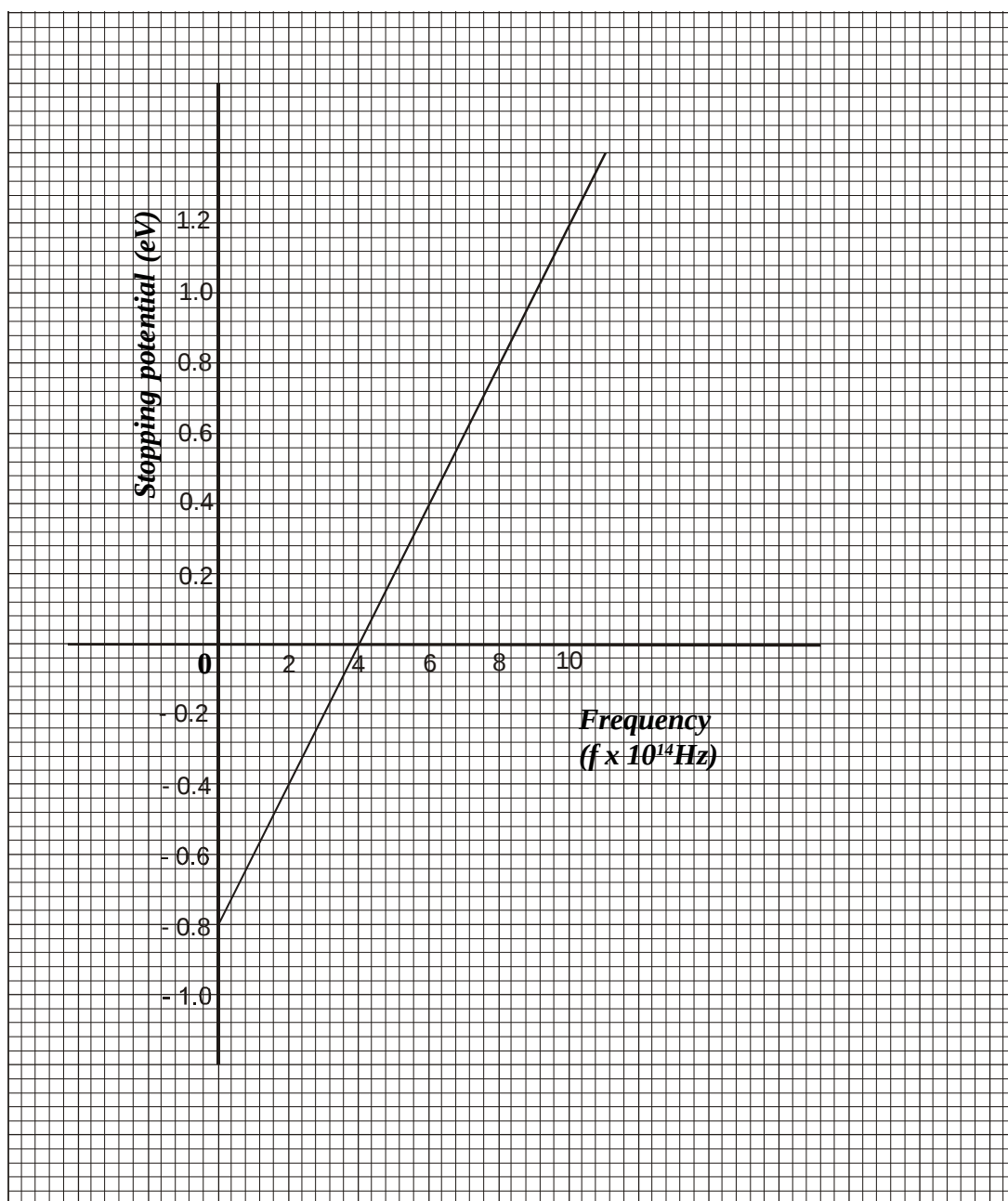
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- (iii) State how the intensity of light affects the photo current. (1 mark)

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- (c) The results obtained for various mono - chromatic radiations of different colours are as shown in the graph below.



- (i) The graph indicates that there is a frequency below which no electrons are emitted. Explain why this is so. (1 mark)

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- (ii) From the graph, determine.  
 (I) Plank's constant,  $h$ . (3 marks)  
 (take electron charge  $e = 1.6 \times 10^{-19} \text{C}$ )

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- (II) The work function,  $W_0$  of the metal. (3 marks)

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17. Figure 12 shows an object placed in front of a concave mirror of focal length 10cm. C is the center of curvature.

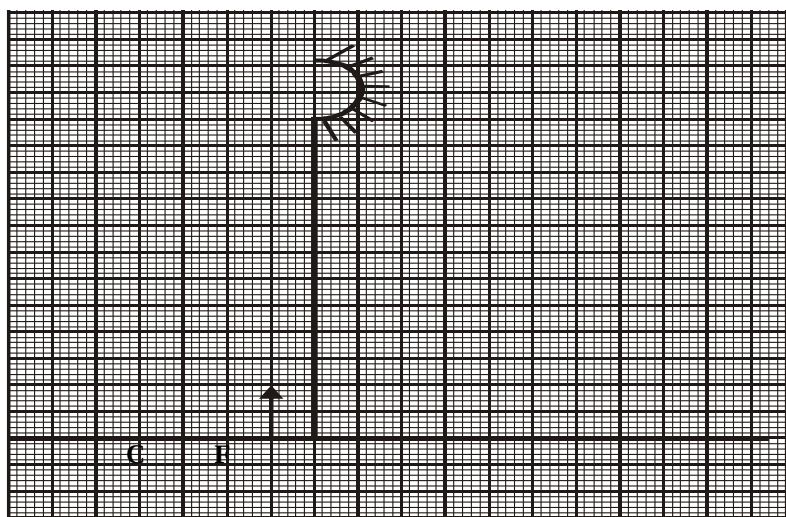


Figure 12

- (a) (i) On the same figure, draw a ray diagram showing the location of the image. (3 marks)

(ii) Use your ray diagram in (i) above to determine.

(a) Image distance. (2 marks)

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(b) Magnification. (2 marks)

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(b) A vertical object is placed 20cm in front of a convex lens of focal length 5cm. Calculate the image distance. (3 marks)

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18. Study the circuit in figure 13 and use it to answer the questions that follow.

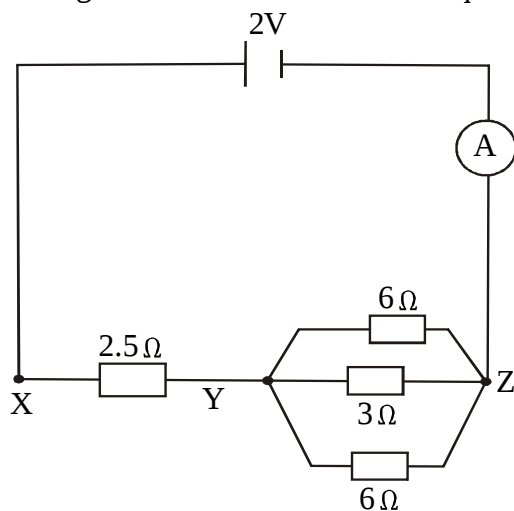


Figure 13

(a) Determine the effective resistance of the circuit. (3 marks)

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(b) Find the ammeter reading. (2 marks)

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(c) Find the P.d between x and y. (2 marks)

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(d) The current through the 3Ω resistor. (2 marks)

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