PHYSICS

PAPER 232/1/2

FORM 3 (THEORY)

MARCH

TIME: 2 ½ HOURS

END TERM 1 2019

INSTRUCTIONS TO CANDIDATES

a) Write your name, admission number and class in the spaces 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 questions in section A and B in the spaces provided.
e) All working must be clearly shown in the spaces provided.
f) Non-programmable silent electronic calculators may be used.

FOR EXAMINERS USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE SCORE
1-17	35 marks	
18-25	65 marks	
Total	100 mrks	

1. A stopwatch started 0.30 seconds after the start baton was pressed. The time recorded using the stopwatch for a ball bearing falling through the liquid was 2.21 seconds. Determine the time of fall (1mk)

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2. The weight of an object on earth is 20N. If the object weight 18N in another planet, determine the gravitational field strength at the planet g=10N/KG (2mks)

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3. (a) State the Pascal's principle (1mk)

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(b) State why a fish at the bottom of the lake will experience more pressure that the fish near the surface. (1mk)

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(c) State why water tanks are placed on top of the buildings and not on the floor. (1mk)

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4. The figure below shows an object O being viewed by an observer.

Draw rays to show the position of the image (2mks)

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5. A highly negatively charged rod is brought slowly towards the cap of a positively charged leaf electroscope. It is observed that the leaf initially falls and then diverges. Explain the observation. (2mks)

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6. Eight dry cells can be arranged to produce a total e.m.f of 12V just like a car battery. Explain why it is not possible to start a car with eight dry cells in series (1mk)

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7. State two factors that affect the rate of diffusion of gases (2mks)

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8. A man standing at the middle of two parallel walls fires a gun. He hears an echo after 1.5 seconds. Determine the distance of separation of the walls given that the speed of sound in air is 340mls (2mks)

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9. A fluid was previously experiencing streamline flow then at a particular point in the tube, the flow changes to turbulent. State two reasons that may have caused this. (2mks)

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10. State one application of the following

(i) Convex mirror   (1mk)

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(ii) Parabolic reflector   (1mk)

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11. The figure below shows a micrometer screw gauge being used to measure the diameter of a rod. The thimble has a scale of 50 divisions.
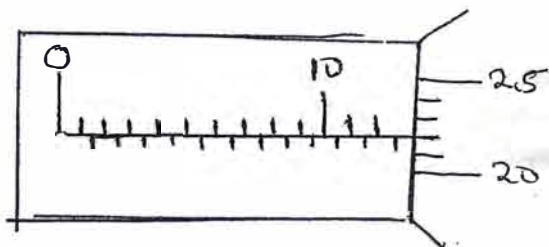
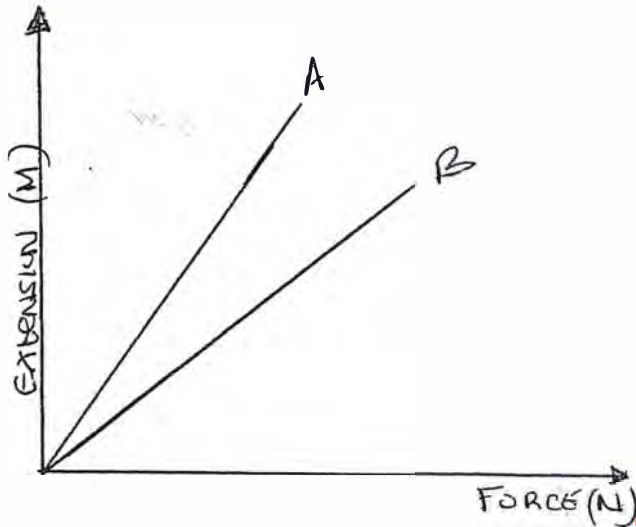Given that the micrometer has a Zero error of -0.04mm, determine the actual diameter of the rod   (2mks)

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12. (a) State Newton's first law of motion   (1mk)

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(b) A force of 3500N acts on a stationary body of mass 20kg for 0.02 seconds. Calculate the velocity attained by the body   (2mks)

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13. The sketches in the figure below shows the variation of extensions with force for springs A and B.

State with a reason which spring has a higher spring constant   (2mks)

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14. The metal lid of a glass jar can be unscrewed easily if the Jar is inverted for a few seconds with the Lid in very hot water. Explain   (2mks)
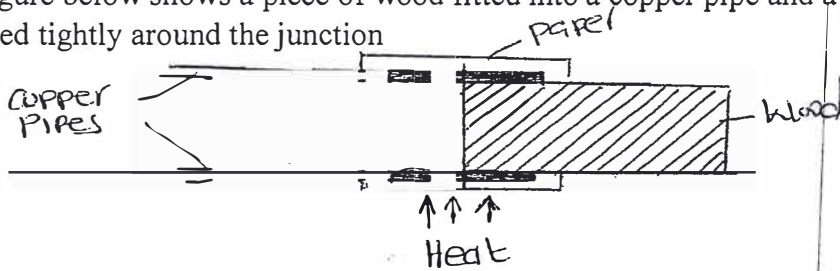
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15. The figure below shows a piece of wood fitted into a copper pipe and a piece of paper wrapped tightly around the junction

It is observed that when a flame is applied around the paper at the junction, the side of the paper around the wood burns first. Explain this observation. (2mks)

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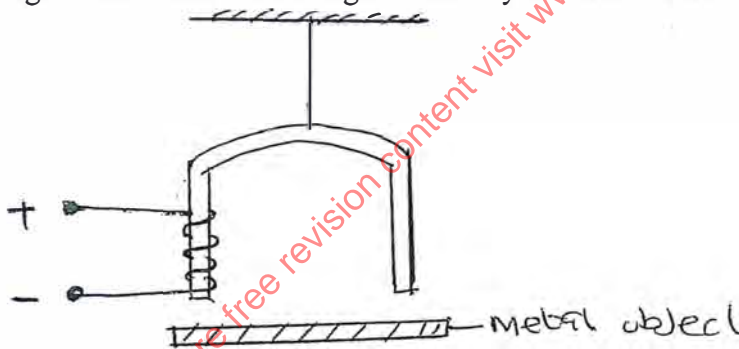
16. An unmagnetized steel rod is clamped facing North – South direction and then hammered repeatedly for some time. When tested, it is found magnetized. Explain this observation using dormain theory. (2mks)

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17. The figure shows an electromagnet made by a student in a laboratory

State two changes the student can make so that a heavier metal block can be lifted by the magnet (2mks)

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SECTION B (65 MKS)

18. (a) The pressure of a laboratory water tap in a school is 40,000N/M. calculate the height of tank from which the water is supplied density water = $1g/cm^3$, g = 10N/kg (3mks)

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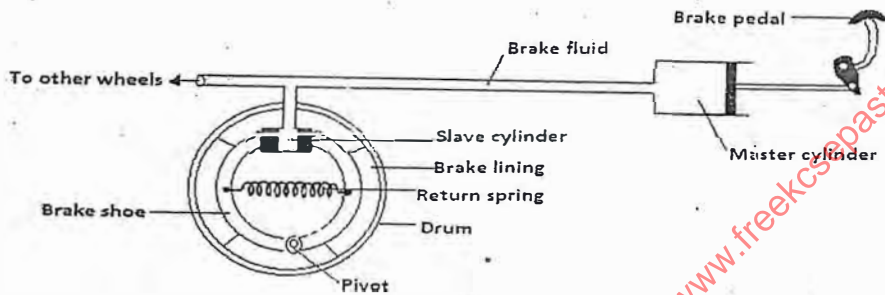
(b) The figure below shows part of a hydraulic brake system.

(i) State two properties of the brake fluid   (2mks)

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(ii) Describe how the above brake system works   (4mks)

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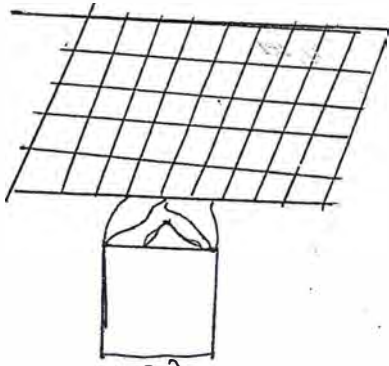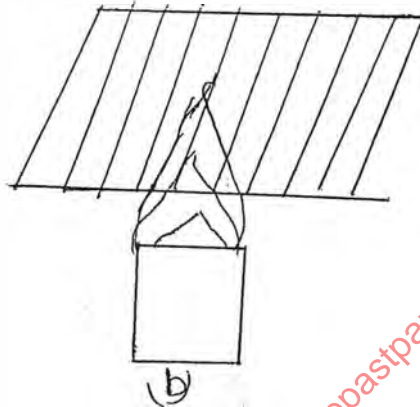..

19. (a) When a Bunsen burner is lit below a wire gauge, it is noted that the flame initially burns below the gauge as shown in figure (a)
After sometime the flame burns below as well as above the gauge as shown in figure (b)
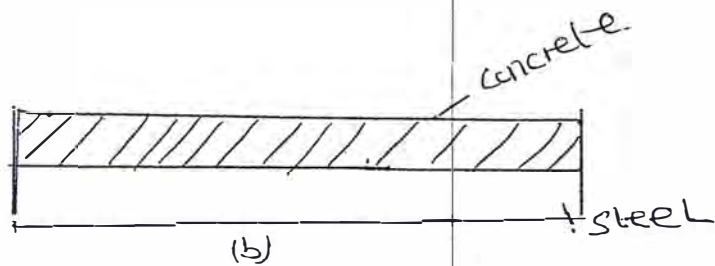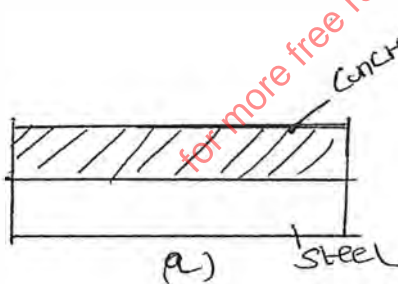

(a)

Explain this observation   (2mks)

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(b) The figure (a) below shows concrete made from concrete and reinforced with steel.

Figure (b) shows the same beam after it has been heated up.

Explain why the beam does not bend   (2mks)

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(c) Sketch a graph of density against temperature of water heated from 0^0C (2mks)

(d) A clinical thermometer has constriction in the bore just above the bulb. State the function of the constriction (1mk)

(e) When a liquid is heated in a glass flask, its level fail at first and the rises. Explain this observation. (2mks)

(f) An electric heater is placed at equal distances from two similar cans A and B filled with wales at room temperature. The outer surface of can A is shiny while that of can B is dull black. State the can that will be at a higher temperature after the heater is switched on for same line (1mk)

20. (a) The figure below shows a section of a flexible wire carrying current perpendicularly out of the paper.
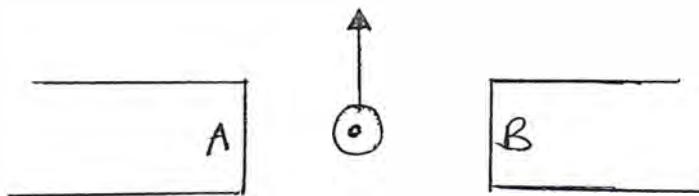
The wire moves in the direction shown ab ove as current passes through it.
(i) Identify the polarity   (2mks)

A ....

B...

(ii) Explain the behavior of the flexible wire   (2mks)

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(b) The figure below shows a coil of insulated wire wound on a horse shoes soft iron core AB
and connected to a power supply
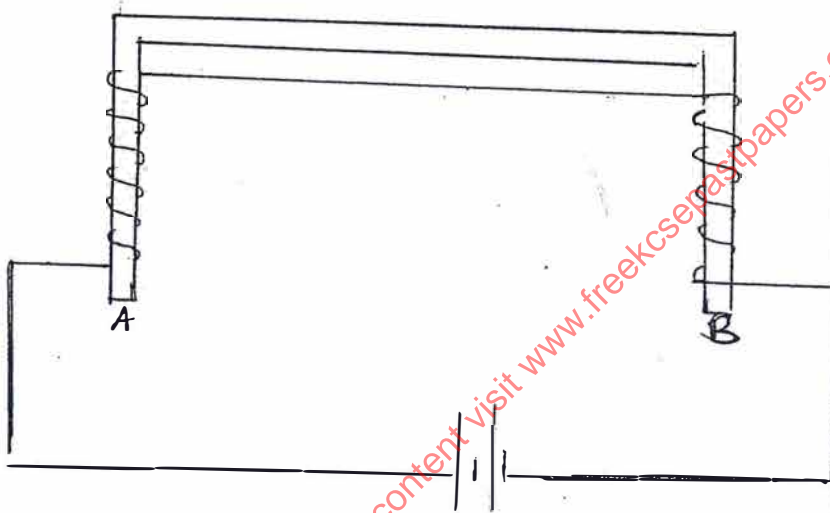
(i) Show the direction of current in the coil   (1mk)

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(ii) State the polarities of   (2mks)

A ....

B ....

(c) The figure below shows the conductors carrying current in opposite direction through a cardboard.
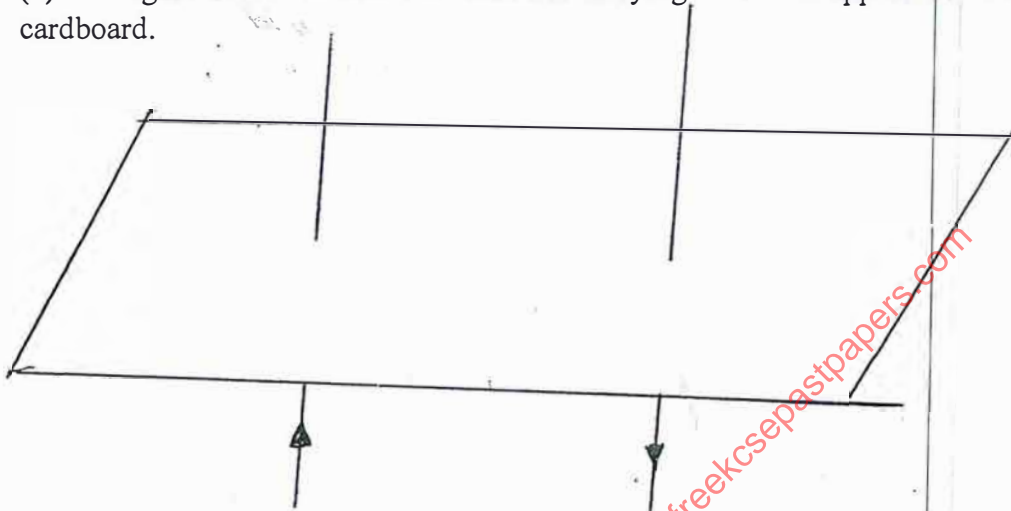
Indicate on the diagram the resulting magnetic field pattern and the effect through them on the conductors   (3mks)

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21. State the principle of moments   (1mk)

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(b) The diagram below shows a uniform bar pivoted at the centre and balanced by weights W, 5N and 30N.
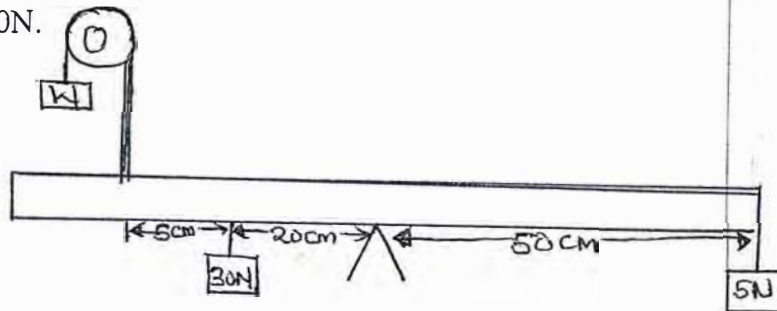
(i) Determine weight W   (3mks)

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(c) State two factors that affect the stability of a body   (2mks)

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(d) State two conditions necessary for a body to be in equilibrium   (2mks)

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22. Define acceleration   (1mk)

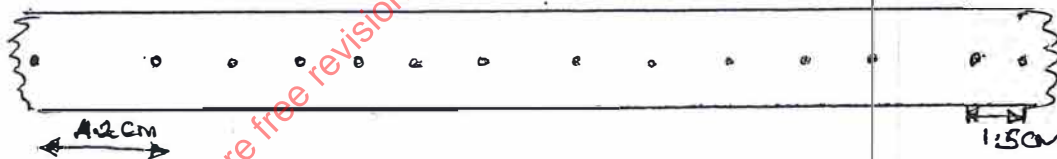...

(b) A tape attached to a moving trolley is run through a ticker timer. The figure below shows a section of the tape after running.

If the ticker-timer has a frequency of 50Hz. Determine the acceleration of the trolley. (3mks)

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(c) On the space provided, sketch on acceleration time graph for a body projected vertically upwards (2mks)
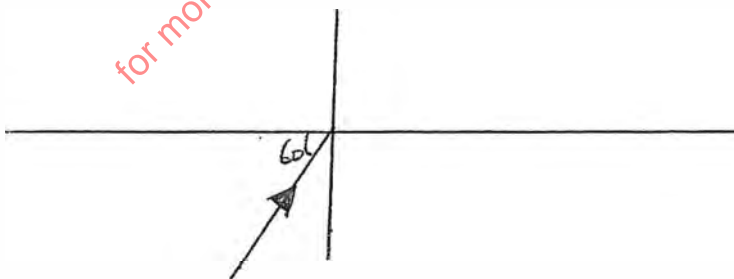
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(d) A stone is thrown vertically upwards. If it reaches a height of 320m, determine its initial velocity given the g=10ms^{-1} (3mks)

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23. (a) Define the term refraction of light (1mk)

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(b) The figure below shows a ray of light travelling in water. The ray strikes the water- air boundary at angle of 60^0 to the boundary.
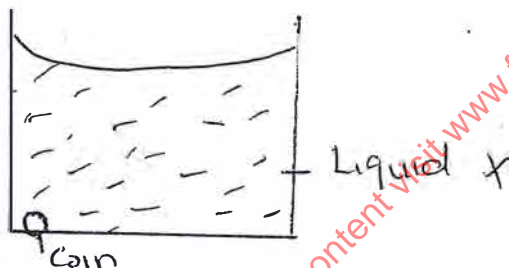

(i) Complete the diagram to show the refracted ray (1mk)

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(ii) Calculate the angle of refraction in air given that the refractive index of water is 1.333

(3mks)

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c (i) The figure below shows a coin in Liquid X .

Draw two rays in the diagram to show the position of the image as seen by the observer.

(2mks)

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(ii) If the depth of the liquid is 50cm and the refractive index of the liquid is 1.25. How far is the image from the bottom of the container.   (3mks)

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24. (a) The figure below shows a displacement distance graph of a wave moving at 4m/s
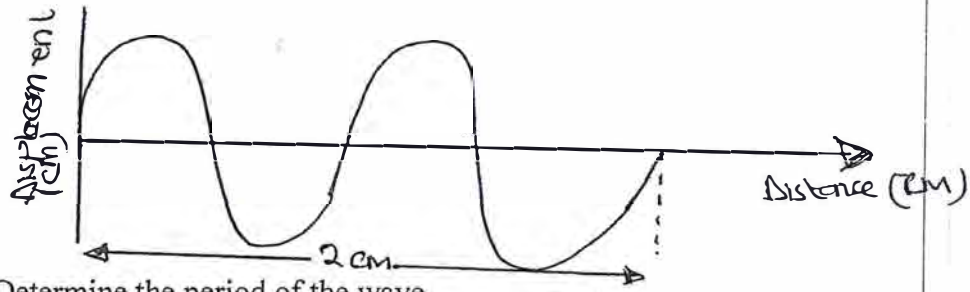
Determine the period of the wave (2mks)

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(b) In a experiment to determine the velocity of sound in air, a student fired a toy gun between two high walls which are X m apart. The nearer wall is 100m from the student. He hears two echoes one after 0.6 seconds and the other after 0.75 seconds. Determine

(i) The velocity of sound in air. (2mks)

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(ii) The distance between the walls (2mks)

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25. (a) A man 1.7m tall stands in front of a pin hole camera of length 30cm. If the height of the screen is 20cm,

(i) Find the distance between the pinhole and the man that will give the largest image

(2mks)

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(ii) What would be the effect on the image if the camera has a length of 40cm. (1mk)

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(b) Illustrate with a sketch how a concave mirror can be used as a shaving mirror (3mks)

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MAY THE ALMIGHTY GOD BLESS THE WORK OF YOUR HANDS