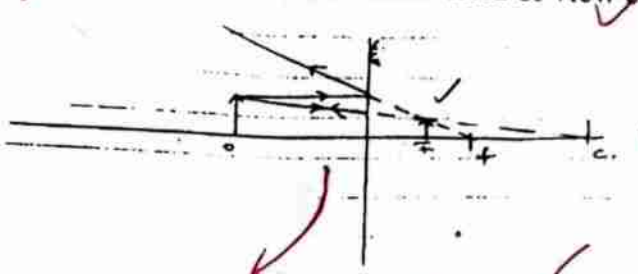
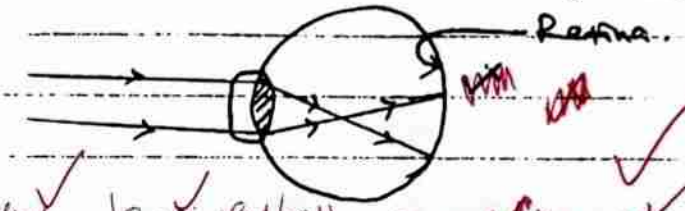
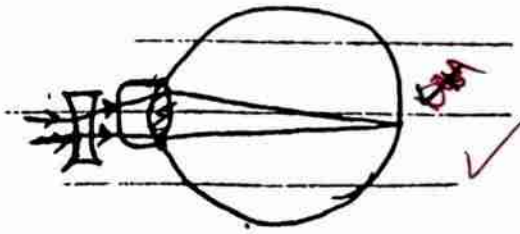
WAKISSHA JOINT MOCK EXAMINATIONS
SCORING GUIDE
Uganda Certificate of Education
July/August 2024
PHYSICS 535/1

1a.	Installing a convex mirror in a corner where the mirror field of view could include the fridge  The convex mirror has a wide field of view, forms diminished images that are upright which makes it easy for the shop keeper to interprete.	
b.	The manager of the store had an eye defect called short sightedness  Image of objects that are far are formed before the retina. The eye defect can be cleared by wearing spectacles with a concave lens  The concave lens diverges the light rays making the image to form on the retina.	
(i)	$V = f\lambda$ $330 = f \times 0.01$ $f = \frac{330}{0.01} = 33{,}000\text{Hz}$ The sound was harmful to their ears since it was above the range of 20Hz – 20, 000Hz which is audible to humans.	
(ii)	The sound was louder at night because at night, the temperatures are low since air near the ground is cooler than that above. This leads to the sound being refracted towards the ground which makes it seem louder than during day. During day, the layers of air close to the ground are warmer than those above it. The sound is therefore refracted away from the ground making it faint.	

2.	$^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{139}_{56}Ba + {}^{91}_{b}Kr + 2\,{}^{1}_{0}n$. 92 + 0 = 56 + b b = 92 – 6 = 36 Yes, it is an isotope of an element with an atomic number 36, and it has the same atomic number.	
b	Conditions necessary for nuclear fission ✓ Heavy unstable nucleus ✓ Low temperatures ✓ The presence of slow-moving neutrons. Precautions taken when handing radioactive materials ✓ Should be kept in lead bunkers. ✓ Should be handled with renovate controlled tongs. ✓ Avoid unnecessary exposure to radioactive materials. ✓ Wear an exposure meter. ✓ Wear a lead jacket. ✓ Maintain a safe distance from radioactive materials.	
c.	✓ Are used for treating diseases. ✓ Tracing leakages in pipes. ✓ Making weapons ✓ Sterilizing medical equipment ✓ In carbon – dating.	
3.	The difference in time is due to rotation of the earth. A portion of the earth directly facing the sun will have sunlight hence day time while another portion facing away from the sun will have darkness hence night time.	
b.	The high waves in the sea. (high tides) are caused by the moon's gravitational attraction on large masses of water on earth. The areas nearest and furthest away from the moon develop burges in the water hence the high tides.	
	After an international number is dialed, a signal is sent to a telecommunications network which initiates the call. ✓ If the call is not in digital form, your voice is converted into digital signals. ✓ The digital signals are transmitted to an earth station equipped with large satellite dishes which uplinks the signal to a communication satellite in the geostationary orbit. ✓ The satellite receives the signal and amplifies it then uses its transponders to send the signal's to an earth station in the respondent's country. ✓ The earth station connects to the respondent's telecommunication network which connects to the recipient's phone.	
4a.	1st part of the journey was at 60km/hrs From S = D/T D = S X T D = 60 X 2 = 120km	

Remaining part of the journey = 250km – 120km = 130km
After the 45 minutes delay
Remaining time = 8:00am – 6.45 a.m = 1hr 15min
= 1.25hrs

Speed if the driver arrives on time = $\frac{130km}{1.25}$
= 104km/hr

The driver exceeded the speed limit of 80km/hr

11

b. As the car was moving the man attained the same velocity as the car. When the brakes are applied on the car, it comes to a halt while the man jerks forward due to inertia.

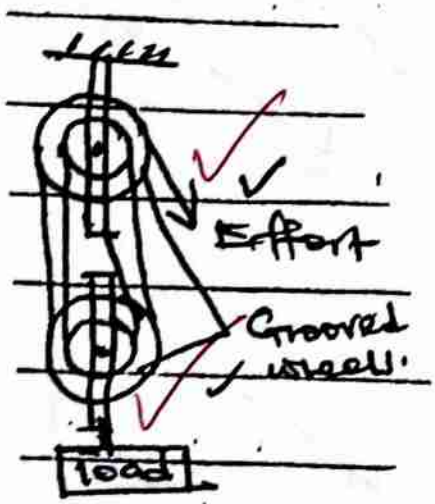
03

c. The sweater is made of a thick material which is a poor conductor of heat and helps regulate heat loss. The block colour is a good absorbor of heat which will help his body gain heat by radiation making him feel warm.

04

5a. In the morning, the bucket loses almost all its heat since it is a good conductor of heat.
In the afternoon, the sun is up and heat from it is radiated to the bucket making it hot.

04

b. 

The lower block is connected to the load.
A light inextensible string is passed over the grooved wheels.

A downward force is applied on the string. This gives the lower block an upward motion.

05

c. $\frac{MA}{VR} X100\%$

$0.8 = \frac{MA}{VR}$

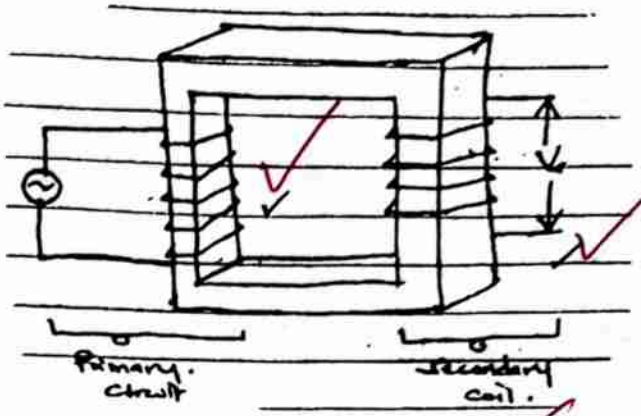
MA = 4 X 0.8
= 3.2

$MA = \frac{L}{E}$

$MA = \frac{(20+4)10}{3.2}$

= 75N

08

		An effort of 5N will not be enough	01
d.	✓ By oiling the moving parts at the machine. ✓ By reducing on the weight of the moving parts. ✓ ~~By increasing the number of wheels.~~	At least 3.	03
6.	The voltage of 13KV is too high since most house hold appliances use a less voltage.  ✓ When an alternating voltage moves through the primary coil, it induces a varying current which flows through the coil. ✓ The changing current induces a changing magnetic flux in the primary coil. ✓ The changing magnetic flux links up with the secondary coil with less turns which induces a lower voltage in the secondary coil.		
b.	The houses were connected in series which increased the resistance leading to low current in the houses. $R = 10 + 12 = 22\Omega$ $V = IR$ $240 = I \times 22$ $I = 10.91A$. If they had been connected in parallel $\frac{1}{R} = \frac{1}{10} + \frac{1}{22}, R = 6.875\Omega$ $V = IR$ $240 = I \times 6.875$ $I = 34.91A$ The houses therefore should be connected in parallel to ensure they receive more current, and the same emf and a fault in one would not affect the other.		

7a

Appliance	Daily Consumption	Monthly Consumption
Cooker	$\frac{3500}{1000}$ X 4 = 14kwh	14 X 30 = 420kwh
Lights	$\frac{60}{1000}$ X 10 = 0.6kwh	0.6 X 30 = 18kwh
Heater	2500 X 0.5 = 1.25kwh	1.25 X 30 = 37.5kwh

Total energy consumed at the end of the month = (420 + 18 + 37.5) Kwh

= 475.5kwh

Cost of electricity = 475.5 X 800 = 380, 400/=

∴ The 65,000/= would not be enough.

b. They should be connected in parallel to allow more current to flow, to have all the appliances work at the same EMF and ensure a fault in one would not affect the other

c Fuses are safety components which protect appliances and wiring by interrupting the flow of excessive current by melting.

How the fuse works.

A fuse consists of a metal wire or strip that melts when too much current flows through it. Under normal conditions, the current flows through the fuse without causing it to melt.
When the current exceeds the fuse's rated capacity, the wire heats up and melts which breaks the circuit preventing the excessive current from reaching the appliance thus preventing potential damage or fire.

END