

## THE KENYA POLYTECHNIC UNIVERSITY COLLEGE

## GRAPHIC ARTS DEPARTMENT DIPLOMA IN PRINTING TECHNOLOGY DIPLOMA IN GRAPHIC DESIGN END OF YEAR I EXAMINATIONS NOVEMBER 2007 SCIENCE 3 HOURS

## **INSTRUCTIONS TO CANDIDATES:**

Answer any FIVE questions.

All questions carry equal marks and the maximum marks for each part of a question are as shown.

This paper consists of  $\underline{4}$  printed pages

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1.	(a) (i)	Define	the term matter.			(2 marks)
	(ii)	Classify	y mater microscoj	pically a	nd macroscopically.	(6 marks)
	(b) Outli	ine FOUR	R factors that influ	ence ior	nization energy.	(4 marks)
	(c) Expla	ain the m	eaning of science.	•		(2 marks)
	(d) State	and expl	ain THREE roles	of scienc	ce in printing/design	n. (6 marks)
2.	(a) State	TWO typ	oes of errors in m	easurem	ents.	(2 marks)
	(b) Expla	ain sublin	nation.			(2 marks)
	(c) Diffe	rentiate b	etween a compo	and and	a mixture.	(4 marks)
	(d) State	FOUR m	ethods of separat	ing mix	tures.	(4 marks)
	(e) Disti	nguish be	etween positive a	nd nega	tive work.	(2 marks)
	(f) Give	$n \ a = \frac{v_f}{t}$	$\frac{-v_0}{t}$ and $x = \left(\frac{v_f + v_0}{2}\right)$	$\left(\frac{v_0}{v_0}\right)t$ wh	nere:	
	$v_f$	- f	final velocity			
	$v_0$	- i	initial velocity			
	t	- 1	time			
	X	- (	distance			
	Deriv	ve the for	mula for kinetic e	nergy. (	Assume the particle	was at rest
	i.e. v	$_{0}=0$ ).				(6 marks)
3.	(a) State	the mean	ning of the term 1	Нр.		(2 marks)
	(b) Defin	ne the foll	owing terms and	state the	e SI units:	
	(i)	Work		(ii)	Energy	
	(iii)	Power				(6 marks)
	(c) Defin	ne the foll	owing terms as u	sed in w	vave motion:	
	(i)	Amplit	ude (A)	(ii)	Wavelength $(\lambda)$	
	(iii)	Freque	ncy (F)	(iv)	Period (T)	(8 marks)
	(d) Expla	ain the te	rm threshold of h	earing o	r audibility.	(2 marks)
	(e) State	why ligh	nt travels in a vacu	uum wh	ile sound cannot trav	vel in a
	vacu	um.				(2 marks)

4.	(a) De	fine the followi	ng terms as us	sed in k	Cinematics:			
	(i)	Force	(2 marks)	(ii)	Inertia	(2 marks)		
	(b) (i)	State the m	State the meaning of friction. (1 mark)					
	(ii)	State TWO	State TWO advantages and TWO disadvantages of friction.					
						(4 marks)		
	(iii)	) Explain TH	IREE types of	friction	ı <b>.</b>	(6 marks)		
	(iv	ties, giving ONE						
		example of	each.			(4 marks)		
	(c) Ca	dy moving at a						
	un	(2 marks)						
	(d) A body starts at rest and attains a velocity of 100m/s after 20 seconds.							
	Ca	lculate the aver	age accelerati	on.		(3 marks)		
5.	(a) De							
	(i)	Strength						
	(ii)	Plasticity						
	(iii)	) Stress						
	(iv)	) Strain						
	(v)	Elasticity				(10 marks)		
	(b) A ball is dropped from a height of 500m. Calculate:							
	(i)	Its velocity	after 5 second	ls		(2 marks)		
	(ii)	Distance tr	aveled after 2	second	S	(2 marks)		
	(iii)	) Time taken	to reach the g	ground		(2 marks)		
	(iv)	) Velocity w	ith which it hi	ts the g	round.	(2 marks)		
	As	sume accelerat	ion due to gra	vity = 1	$0$ m/s $^2$ )			
	(c) Ou	ıtline FOUR typ	oes of strain.			(2 marks)		
6.	(a) De	fine the followi	ng as used in	sound	waves:			
	(i)	Intensity						
	(ii)	Pressure le	vel					
	(iii)	) Sound pres	ssure level			(6 marks)		

		(4 marks)				
(c) S	(c) State the units used to describe sound pressure level.					
(d) S	(d) State the range of sound pressure of audible sounds.					
(e) E	(e) Explain the effect of sound pressure greater than 120dB.					
(f) S	(f) State the equation of:					
(i	) A sine wave					
(i	i) A cosine wave					
(i	ii) Draw a sketch of both on one axis.	(5 marks)				
(a) D	(a) Define the work energy theorem and state its equation.					
(b) (i	) Define nuclear energy.	(2 marks)				
(i	i) Write the equation for radioactive decay.	(4 marks)				
(c) A cyclist starting at 50km/h applies his brakes and comes to a stop with						
u	uniform deceleration in 10 seconds. Calculate the rate of de					
		(4 marks)				
(d) S	(d) State the THREE Newton's laws of motion.					