

Design and Technology

General Certificate of Secondary Education **1957/08**

Systems and Control Technology Paper 8: Mechanisms

Mark Scheme for June 2010

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Question			Spec Ref	Expected Answers	Marks	Additional Guidance
1	(a)			lightweight; non rust; high strength to weight ratio easily extracted	[2]	Not strong
	(b)			modelling: of forces that need to be withstood; predicted maximum height needed; calculating quantities of materials required; electronic transfer of design to manufacturer; Note: explained for full marks	[4]	WAYS explained Interrogating database for materials
	(c)			class 3	[1]	
	(d)			Class 3 lever gives greater lifting distance; can be folded into a more compact space when transporting; allows jib to be extended	[2]	Understanding of situation 1 Mark
	(e)			lower lifting force	[1]	
2	(a)			Fine adjustment; powerful movement achievable; compact; rapid adjustment, locking	[2]	
	(b)			reduction of friction; allows higher force to be applied; less chance of stripping Explained for maximum marks	[2]	
	(c)			Vice; car jack; stilson; adjustable spanner	[1]	
	(d)			rotary to linear	[1]	
	(e)			allow to stay pivot Prevent rotation Secure attachment to barrier Appropriate labels	[4]	

Question			Spec Ref	Expected Answers	Marks	Additional Guidance
3	(a)			allows drive in one direction while allowing return movement of wrench without loosening nut being tightened	[2]	Tighten or untighten 1 Mark
	(b)			ratchet wheel accurately drawn (1) Pawl correctly engaging with ratchet (1) Spring loading on pawl (1) Annotation (1)	[4]	
	(c)			Wet environment; friction caused by grit; Explained	[2]	General lubrication 1 mark
	(d)			grease ; WD40; silicon grease Prevents ingress of water; high viscosity of grease prevents washing away	[2]	

4	(a)			over centre locking (1) Stop (1) Load helps locking action – explained (2)	[4]	Not an explanation of how to adjust mole grip
	(b)			'V' shaped jaw if soft jaw allow 1 mark	[2]	
	(c) (i)			Idler gear; causes driven gear to rotate in same direction as driver	[2]	
	(ii)			$VR = 80/40 = 1:5$ (1) Output speed = $500 \times 5 = 2500$ RPM (1)	[2]	If correct output speed without calculation maximum mark

Question			Spec Ref	Expected Answers	Marks	Additional Guidance
5	(a)			no cost; safety; environmental; explained	[2]	
	(b)			Axe: slow lift (1) Sudden fall (1) Worm: oscillate across (2) (Allow 1 mark for one direction) Components correctly labelled: (2) Snail cam (If 'cam' allow 1 mark) Follower (1) Crank (1)	[8]	

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