

Question			Answer	Marks	Guidance
16	(a)	(i)	scales and hair help to reduce heat loss ✓ generate heat from , respiration / metabolism ✓	1max	ALLOW generate heat internally IGNORE temperature
	(a)	(ii)	(insects are smaller and) have a , large(r) / AW , surface area to volume ratio ✓ (insects have) <u>greater</u> rate of heat loss ✓ mammals and birds have , more effective / <u>thicker</u> , insulation ✓ <i>ref to a method</i> of more precise control of body temperature in birds and mammals ✓	2 max	Mps 1 and 2 ALLOW ora for mammals (must be comparative) ALLOW SA:V / surface area relative to volume ALLOW lose heat more , quickly / easily ALLOW have fat under skin ALLOW ora for insects (must be comparative) e.g. thermoregulatory centre / heat gain / heat loss centre e.g. vasodilation / vasoconstriction e.g. sweating / shivering / hairs standing up
16	(b)	(i)	spiracle (s) ✓	1	ALLOW stigma(ta) DO NOT ALLOW stomata
	(b)	(ii)	<u>trachea(l)</u> (fluid) ✓	1	IGNORE haemolymph IGNORE tracheole

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16	(c)	<p>high metabolic , demands / rate ✓</p> <p>need , large oxygen / rapid oxygen , supply ✓</p> <p><u>diffusion</u> , not sufficient / too slow / distance too far ✓</p> <p>(to) <u>maintain</u> , steep / AW , concentration / diffusion , gradient(s) ✓</p> <p>surface area to volume ratio is (usually) low ✓</p> <p>(named) metabolite(s) needed by <u>cells</u> / (named) waste(s) removed from <u>cells</u> ✓</p>	3 max	<p><i>give credit to examples used in the correct context</i></p> <p>ALLOW high rate of respiration</p> <p>IGNORE not efficient</p> <p>ALLOW SA:V / surface area relative to volume</p> <p>ALLOW nutrients / hormones</p> <p>IGNORE oxygen</p> <p>ALLOW toxins</p>

Question		Answer	Marks	Guidance
16	(d)	<p>1 large size / at least 50% of available space ✓</p> <p>2 title / heading ✓</p> <p>3 labels outside diagram ✓</p> <p>4 label lines should not cross over others ✓</p> <p>5 continuous lines ✓</p> <p>6 no shading ✓</p> <p>7 use plain paper ✓</p> <p>8 state magnification ✓</p> <p>9 correct proportions ✓</p>	2 max	<p>IGNORE numbered lines and mark as prose</p> <p>IGNORE references to detail of diagram</p> <p>ALLOW once only no , sketching / feathering for either mp5 or mp6</p>
		Total	10	