11.3 The kidney – *summary of mark schemes*

11.3.1	Define *excretion*. Mark Scheme A. removal of waste from the body; B. products of metabolism / toxic waste products;
11.3.2	Draw and label a diagram of the kidney. Mark Scheme A. cortex shown at the edge of kidney; B. medulla shown inside the cortex (with pyramids); C. pelvis shown on the concave side of the kidney; D. ureter shown connecting with the pelvis / on concave side / hilum; E. renal artery shown connected to the concave / pelvis side / away from cortex; F. renal vein shown connected to the concave / pelvis side / away from cortex;
11.3.3	Annotate a diagram of a glomerulus and associated nephron to show the function of each part. Mark Scheme A. glomerulus; B. fenestrated capillaries; (shown as an enlarged diagram) C. afferent arteriole; D. efferent arteriole; (with smaller diameter than afferent) E. Bowman's capsule; (shown as a continuation of proximal convoluted tubule)] F. ultrafiltration / high pressure in the glomerulus; G. glomerular filtrate produced in Bowman's capsule; H. flows to proximal convoluted tubule; I. proximal convoluted tubule; (shown with convolutions) J. 80% of water reabsorbed; K. filtrate enters descending limb / loop of Henle; L. ascending and descending both labeled; M. descending limb permeable to water / water drawn out by osmosis; N. ascending limb pumps sodium into tissues; O. ascending limb impermeable to water; P. decrease in filtrate concentration (in ascending portion); Q. distal convoluted tubule; (shown with convolutions) R. concentration in distal convoluted tubule equals concentration in proximal convoluted tubule; S. collecting duct; (shown with branches) T. high solute concentration ADH released / ADH controls water balance; U. ADH makes collecting duct water permeable to water; V. so water can move to tissues / so the urine is more concentrated;
11.3.4	Explain the process of ultrafiltration, including blood pressure, fenestrated blood capillaries and basement membrane. Mark Scheme G. high pressure in afferent arterioles; H. difference in diameter of efferent and afferent arteriole; I. leads to blood in glomerulus at high pressure; J. capillary wall is fenestrated / has pores / holes;leads to ultrafiltration in the glomerulus / through fenestrated capillaries in the glomerulus; K. basement membrane has pores; L. pores in basement membrane prevent large (protein) molecules from leaving blood plasma / only allows passage of small molecules; M. drains through the Bowman's capsule to the proximal convoluted tubule; N. passive process;

11.3.6	Explain the reabsorption of glucose, water and salts in the proximal convoluted tubule, including the roles of microvilli, osmosis and active transport. Mark Scheme A. important that some products of digestion not lost; B. products in the blood stream; C. ultrafiltration in the glomerulus; D. fenestrated capillaries / podocytes; E. basement membrane acts as the filter; F. proteins too large to pass through; G. importance of proximal convoluted tubule; H. reabsorption of salts / glucose / ions / other named substance; I. microvilli; J. details of active transport; K. osmosis is the reabsorption of water; L. detail of osmoregulation;