NEET BIOLOGY

EXCRETORY PRODUCTS AND THEIR ELIMINATION

1.	Which of the following is	correct with reference to h	aemodialysis?	
	a) Absorbs and resends e	excess of ions	-	
	b) The dialysis unit has a	coiled cellophane tube		
	c) Blood is pumped back	through a suitable artery a	fter haemodialvsis	
	d) Anti-heparin is added	prior to haemodialysis	j.	
2	Polyuria is a condition in	which		
	a) Amount of urine pass	out is more	h) Amount of urine pass (nut is less
	c) No urine pass out		d) No urine formation	
3	Glucose Na and amino a	cid are actively transported	substances because	
0.	a) Their movement occu	rs according to concentration	on gradient	
	b) Their movement occur	rs against concentration gr	adient	
	c) ATP is not needed for	transportation		
	d) They are transported l	av simple diffusion		
4	Which of the following is	hoth osmoregulator as wel	l as nitrogenous product?	
1.	a) NH ₂	h) IIrea	c) Ilric acid	d) All of these
5	With respect to mode of a	excretion hony fishes are?	ej one dela	a) fin of these
5.	a) Osmoconformers	h) Ammonotelic	c) Uricotelic	d) Uriotelic
6	Identify the true stateme	nts and choose the correct	ontion accordingly	uj onotene
0.	I Blood vessel leading to	the glomerulus is called eff	erent arteriole	
	II Vasa-recta neritubular	r canillaries and glomerulu	s all have blood	
	III. Cortical penhrons hav	ye highly reduced vasa-rect		
	IV Vasa-recta runs narall	el to the Henle's loon in the	a iuaxta-medullary nenhror	ı
	a) I II and III	h) I II and IV	c) I III and IV	d) II_III and IV
7	The vellow colour of urin	e is due to the presence of	cj i, ili alla iv	aj îi, în ana îv
<i>,</i> .	a) Ilrea	h) Uric acid	c) Urochrome	d) Biliruhin
8	Choose the correct option	of or A B C from given onti	on	aj bili abili
0.	Excessive loss of fluid from	bodv		
	Activate receptors which stim	ulate		
	A			
	To release the			
	В			
	From neurohypophysis			
	Facilitate water reabsoption	1		
	from latter parts of the			
	a) A-Adrenal cortex, B-Al	DH, C-PCT	b) A-Adrenal medulla, B-	ADH, C-PCT
•	c) A-Hypothalamus, B-AI	OH, C-Distal tubules	dJ A-Lungs, B-ADH, C-Dis	tal tubules
9.	Structural and functional	unit of the kidney is		
	a) Medulla	b) Nephridia	c) Nephron	d) Hilum

10.	Marine teleost fishes excrete		
	a) Uric acid b) Ammonia	c) Urea	d) None of these
11.	Identify A to D in the given structure and choose the	e correct option accordingly	,
	Renal artery		
	a) A-Calyx, B-Cortex, C-Renal column, D-Ureter		
	b) A-Calyx, B-Cortex, C-Renal column, D-Urethra		
	c) A-Urethra, B-Cortex, C-Renal column, D-Calyx		
	d) A-Urethra, B-Calyx, C-Renal column, D-Cortex		
12.	The net filtration pressure in the glomerulus of the	kidney is	
	a) 70 mm Hg b) 35 mm Hg	c) 25 mm Hg	d) 10 mm Hg
13.	Loop of Henle is meant for the absorption of		
	a) Potassium b) Glucose	c) Water	d) Carbon dioxide
14.	Functioning of kidney is efficiently regulated by		
	a) ANF b) JGA	c) Both (a) and (b)	d) Lungs
15.	Select the correct pathway for the passage of urine	in humans	
	a) Renal vein \rightarrow Renal ureter \rightarrow Bladder \rightarrow Urethra		
	b) Collecting tubule \rightarrow Ureter \rightarrow bladder \rightarrow Urethra		
	c) Pelvis \rightarrow Medulia \rightarrow Bladder \rightarrow Urethra		
16	u) contex \rightarrow medulia \rightarrow bladuel \rightarrow offeter The waste products produced in map which pood of	veration are?	
10.	a) Carbon diovide b) Urea and salts	c) Excess of water	d) All of these
17	Excretion of nitrogenous waste product in semisoli	from occurs in	uj Ali ol tilese
17.	a) Ilreotelic animals	b) Ammonotelic animals	
	c) Uricotelic animals	d) Amniotes	
18.	Juxta glomerular apparatus is modification in the	.,	
	a) Afferent atriole and PCT	b) Afferent atriole and DO	CT
	c) Efferent atriole and DCT	d) Efferent atriole and PC	Т
19.	A large quantity of fluid is filtered every day by the	nephrons in the kidneys. Or	nly about 1% of it is
	excreted as urine. The remaining 99% of the filtrate		
	a) Gets collected in the renal pelvis	b) Is lost as sweat	
	c) Is stored in the urinary bladder	d) Is reabsorbed into the	blood
20.	Autoregulation of GFR (Glomerulus Filtration Rate)	is takes place by	
	a) Renin angiotensis mechanism	b) Juxtaglomerulus appar	atus
	c) Vasopressin	d) All of the above	
21.	Physiologically urea is produced by the action of an	enzyme	
0.0	a) Arginase b) Urease	c) Uricase	d) None of these
22.	Malpighian body or renal corpuscie is/are		
	a) Bowman's capsule	b) Giomerulus	. l l .
1 2	CJ DUUI (a) anu (D)	uj Proximal convoluted ti	ubule
۷3.	Among ammonia, unc aciu anu urea, wnich one is ti	c) Both (a) and (b)	d) Urea
21	aj minionia UJ ULU duu The living steady state has a self regulatory mechan	c_j boun (a) and (b)	ujulea
47.	a) Feed back mechanism	h) Homeotherms	
	c) Homozygous	d) Homeostasis	
	-,,		

25.	Uricotelism is found in			
	a) Mammals and birds		b) Fishes and freshwater	protozoans
	c) Birds, reptiles and insec	ts	d) Frogs and toads	
26.	Volume of urine is regulate	ed by		
	a) Aldosterone		b) Aldosterone and testos	sterone
~-	c) ADH		d) Aldosterone and ADH	
27.	Urine is yellow in colour, d	ue to		
	a) Prochrome	b) Haemoglobin	c) Urochrome	d) Creative
28.	Vasa recta is minute vessel	of Peritubular capillaries	network, which is	
	a) Also known as juxta-glo	merular apparatus	b) Running parallel to loo	p of Henle
20	c) Running parallel to PCI	longed feating Ilia uning	d) Running parallel to DC	l
29.	A person is undergoing pro	bionged fasting. His urine v	will be found to contain ab	d) Chasses
20	a) rais	DJ Kelones from tigguag without boing	C) AIIIIIO acius	a) Glucose
50.	a) Burst open and die	irom ussues without being	b) Not be affected at all	
	a) Duist open and the	ma	d) Shrivel and die	
31	Part of the kidney through	ma which the ureter blood w	assols and nerves enters in	to it is
51.	a) Renal cortex	h) Renal medulla	c) Hilum	d) Ilrothra
32	Which one of the following	correctly explains the fur	oction of a specific part of a	human nenhron?
02.	Henle's loon – Most real	sorption of the major	Distal convoluted tubu	le–Reasorption of ions into
	a) substances from the glo	merular filtrate	b) the surrounding blood	canillaries
	substances if our the gio		Podocytes–Creat minu	ite spaces (slit pores) for
	Afferent arteriole–Carri	ies the blood away from	d) the filteration of blood	into the Bowman's
	the glomerulus towards	renal vein	capsule	
33.	When does glomerular filt	ration occurs in Bowman's	s capsule?	
	a) When hydrostatic press	ure of blood in the glomer	ulus is 70 mm Hg and net f	filtrate pressure is -25 mm
	Hg			
	b) When hydrostatic pressure of blood in the glomerulus is 70 mm Hg and net filtrate pressure is -35 mm			
	Hg			
	c) When hydrostatic press	ure of blood in the glomer	ulus is 70 mm Hg and net f	filtrate pressure is 10 mm
	Hg			
	d) When hydrostatic press	ure of blood in the glome	rulus is 70 mm Hg and net	filtrate pressure is -70 mm
<u>.</u>	Hg			
34.	Smell of urine is due to the) II	
25	a) Urochrome	b) Urinode	c) Urea	d) Melanin
35.	The counter current mecha	anism operates in nephror		1. / . 1
	a) In ascending and descer	iding limb of vasa recta	b) In ascending limb of He	enle's loop
26	c) in descending limb of He	enie s loop	a) Between the loop of He	enie and vasa recta
36.	The average quality of urea	h) 25, 20 g	a) 1 1 5 J	d) 00 a
27	a) 1-5 g Molenuria is caused by the	0) 25-50 g	Сј 1-1.5 L	u) ov g
57.	a) Alanina	b) Tyrosing	c) Proline	d) Truntonhan
38	Which one of the following	statements is correct wit	b respect to kidney function	n regulation?
50.	a) Exposure to cold temper	rature stimulates ADH rel	ease	in regulation.
	b) An increase in glomerul	ar blood flow stimulates fo	ormation of angiotensin II	
	c) During summer when h	ody loses lot of water by e	vaporation. the release of	ADH is suppressed
	d) When someone drinks le	ot of water ADH release is	stopped	
39.	Blood leaving liver and goi	ng towards heart is rich ir	1	
	a) Bile	b) Urea	c) Ammonia	d) Oxygen
40.	Urea synthesis occurs in	-	-	
	-			

4.1	a) Kidney b) Liver	c) Brain	d) Muscles
41.	a) Respiration b) Excretion	c) Digestion	d) Reproduction
42.	I. Na ⁺ II. H_2O		
	III. HCO_3 IV. H'		
	V. K VI. NII3 Which of the given ions are reabsorbed and secreted	L DCT7	
	Reabsorb Secreted		
	a) I, II and III IV, V and VI	b) IV, V and VI I, II and	III
40	c) I, II and V III, IV and V	d) III, IV, and VI I, II and	V
43.	Reabsorption of the filtrate in the renal tubules take	s place by	
4.4	a) Active means b) Passively means	C) Eitner (a) or (b)	d) Usmosis means
44.	Aldosterone causes reabsorption ofA from distal	i part of tubule. This leads t	to increase inB
	Here A and B refers to a) A Na^{+} , B CEB b) A water, B CEB	a) Dath (a) and (b)	d) A CIT, D CED
45	a) A-Na ⁺ ; B – GFK D) A-water; B-GFK	c) Both (a) and (b)	UJA-UI; B-GFK
45.	In numan, excretory system consists of		
	IL uringry bladder III Urothra		
	V skin VI Jungs		
	VII liver		
	a) I II III and II	h) I II III and IV	
	c) I. II. III and IV	d) I. II. III. IV. V. IV and VI	I
46.	The net pressure gradient that cause the fluid to filte	er out of the glomeruli in th	e capsule is
-	a) 20 mm Hg b) 75 mm Hg	c) 30 mm Hg	d) 50 mm Hg
47.	In the glomerulus of the nephron, the afferent arterio	ole is	, 0
	a) Narrower than efferent arteriole	b) Wider than efferent ar	teriole
	c) Of some diameter as efferent arteriole	d) Of same diameter as va	asa-recta
48.	NaCl is returned to interstitium by		
	a) Ascending limb of Henle's loop	b) Descending limb of He	nle's loop
	c) Ascending limb of vasa recta	d) Descending limb of vas	sa recta
49.	Identify A to D in the following structure and choose	the correct option for A, B	, C and D
	a) A-Afferent arteriole. B-Efferent arteriole. C-Bowm	an's capsule. D-Proximal o	onvoluted tubule
	b) A-Efferent arteriole, B-Afferent arteriole, C-Bowm	an's DTC	
	c) A-Efferent arteriole, B-Efferent arteriole, C-Bowm	an's capsule, D-DCT	
	d) A-Efferent arteriole, B-Afferent arteriole, C-Bowm	an's capsule, D-DCT	
50.	Choose the correct statements		
	a) Sebaceous gland eliminate sterols, hydrocarbons,	waxes	
	b) Secretion of sebaceous gland provide oily protect	ive covering of skin	
	c) Small amount of nitrogenous wastes eliminated the	nrough saliva	
	d) All of the above		
51.	Choose the correct option with respect to the maxim	ium urea level	
	a) Renal vein b) Hepatic vein	c) Pulmonary artery	d) Pulmonary vein
52.	Renin is secreted from		
			-

F 2	a) Juxtaglomerular cells b) Podocytes	c) Nephridia	d) Stomach
53.	Main function of DC1 of nephron is to maintain the		
	a) prin blood	b) Na-K balance of blood	
۲4	C) Both (a) and (b)	a) remperature of blood	
54.	oric acid is the chief nitrogenous excretory compon	ent of	J) Europ
r r	a) Man D) Earthworm	c) Lockroach	a) Frog
55.	A fail in the GFR rate activates the	h) IC colle to volcopo oldo	atovovo
	a) IC cells to release relinit	d) IC cells to release aluo	sterone
۲ <i>c</i>	C) JG cens to release epinephrine	a) JG cells to release nor-	epinepinne
50.	Name the condition when the concentration of keto	a) Diabatas incinidus	d) Cuching's diasaas
57	The excretery organ in crustaceans, like praying is	c) Diabetes insipidus	uj cushing s uisease
57.	a) Antonnal glands b) Nonbridia	c) Elamo collo	d) Malnighian tuhulog
50	Which one of the following statements in regard to	the overetion by the human	uj maipigiliali tubules
50.	a) Descending limb of loop of Henle is impermeable	to water	Runeys is correct:
	b) Distal convoluted tubule is incarable of reabsorn	tion HCO	
	c) Nearly 99 per cent of the glomerular filtrate is re	absorbed by the renal tubu	امد
	d) Ascending limb of loop of Henle is impermeable t	to electrolytes	
59	Glucose and amino acids are reabsorbed in the	to electrolytes	
07.	a) Proximal tubule b) Distal tubule	c) Collecting duct	d) Loop of Henle
60	What is the obligatory water reabsorption?	ej doneeting daet	uj hoop of fielde
001	a) Reabsorption of water from PCT	b) Reabsorption of water	from loop of Henle
	c) Both (a) and (b)	d) Water secretion by Bo	wman's capsule
61.	Ammonia or urea are the waste products, which are	e derived from	
•	a) Proteins b) Carbohydrate	c) Lipids	d) Fats
62.	Transport of electrolytes through loop of Henle take	es place by	
	a) Actively b) Passively	c) Both (a) and (b)	d) Diffusion
63.	Choose the correct statement.	, , , , ,	,
	a) The juxta medullarly nephrons have reduced Her	nle's loop	
	b) Vasa recta is well developed in cortical nephrons	-	
	c) The PCT and DCT are situated in the medulla of t	he kidney	
	d) The ascending limb of the Henle's loop extends a	s the DCT	
64.	Which one is mismatched?		
	a) Bowman's capsule–Glomercular filtration	b) PCT–Absorption of Na	a ⁺ and K ⁺
	c) DCT–Absorption of glucose	d) None of the above	
65.	In which of the following regions of a nephron, does	s maximum reabsorption of	useful substances takes
	place?		
	a) Henle's loop	b) Glomerulus	
	c) Proximal convoluted tubule	d) Distal convoluted tubu	ıle
66.	Urea cycle is also called		
	a) Kreb's cycle b) Henselet cycle	c) Kreb-Henselet cycle	d) Dark reaction
67.	Percentage of electrolytes and water reabsorbed by	PCT is	
	a) 60-70 b) 70-80	c) 80-90	d) 90-95
68.	ADH is also called		
	a) Vasopressin b) Prolactin	c) Urease	d) Oxytocin
69.	Gout is a condition in which		
	a) High level of urine in blood is found	b) High level of urea in bl	ood is found
	c) High level of uric acid in blood is found	d) All of the above	
70.	During urine formation, which of the following proc	esses create high osmotic p	pressure in the uriniferous
	tubule?		

	a) Active Na ⁺ absorption, followed by absorption of Cl^-			
	b) Active Cl ⁻ absorption, followed by absorption of Na ⁺			
	c) Active secretion of Na ⁺ into efferent arteriole followed by absorption of Cl ⁻ into efferent renal arteriol			
	d) Active secretion of Cl^- and absorption of Na^+ into efferent renal arteriole			
71.	Order of toxicity among ammonia, urea and uric	c acid (from lower to higher) is	S	
	a) Uric acid < urea < ammonia	b) Uric acid < ammonia	< urea	
	c) Urea < uric acid < ammonia	d) Ammonia < urea < u	ric acid	
72.	Which substance is in higher concentration in b	lood than in glomerular filtrat	e?	
	a) Water b) Glucose	c) Urea	d) Plasma proteins	
73.	Average pH of human urine is			
	a) 6.0 b) 9.0	c) 3.0	d) 7.0	
74.	A portion of uric acid is converted to urea and a	mmonia by intestinal		
	a) Urogenolysis b) Ureolysis	c) Uricolysis	d) Ureotolysis	
75.	Mammals have the ability to produce			
	a) Isotonic urine b) Hypertonic urine	c) Hypotonic urine	d) Acidic urine	
76.	The process of excretion is the			
	a) Removal of useful substances from the body			
	b) Removal of metabolic waste from the body			
	c) Removal of the substances which have never	been a part of the body		
	d) Formation of useful substances in the body			
77.	Which one of the following amino acids is not fo	ound in proteins?		
	a) Arginine b) Ornithine	c) Aspartic acid	d) Tyrosine	
78.	Inner to the hilum of the kidney, there is a broad	d funnel-shaped space called		
	a) Renal pelvis b) Medulla	c) Cortex	d) Adrenal gland	
79.	Vasopressin released from the neurohypophysis	s is mainly responsible for		
	a) Facultative reabsorption of water through He	enle's loop		
	b) Obligatory reabsorption of water through Bo	wman's capsule		
	c) Facultative reabsorption of water through DC			
	d) Obligatory reabsorption of water through PC	Τ	1	
80.	What will happen if the stretch receptors of the	urinary bladder wall are total	ly removed?	
	a) Urine will not collect in the bladder			
	b) Micturition will continue			
	c) Urine will continue to collect normally in the	bladder		
01	d) There will be no micturition			
81.	Giomerulus is a tuft of capillaries formed byA	(A fine branch of renal arter	ry). Blood from the	
	glomerulus is carried away by anB	a the given NCEPT statement		
	select the correct option for A and B to complete	e the given NCERT statement	for any atrials	
	a) A efferent atriole; B efferent atriole	b) A efferent atriole; B-	efferent atriole	
02	C) A-anerent atriole; B-anerent atriole	d) A-allerent atriole, B-e		
02.	RAAS	A releases renin in response t	o various stimuli	
	a) is triggered when juxta-giomerular cens of jo	an releases renni in response (o various stilluli	
	c) Is a powerful mechanism responsible for regu	ulation of functioning of heart		
	d) Both (a) and (b)	ulation of functioning of near t		
83	Nenhritis is caused by			
05.	a) Fungi b) Ractoria	c) Virus	d) Protozoa	
84	Ammonia is converted into urea in	cj virus	uj 1 101020a	
04.	a) Kidney b) Lungs	c) Liver	d) Spleen	
85	Solenocytes are used for		a) opiceli	
55.	a) Elimination of nitrogenous excretory wastes	b) Respiration		
	a, wastes	S, Respiration		

	c) Digestion	d) All of the above		
86.	Nitrogenous waste products are eliminated mainly a	as		
	a) Urea in tadpole and uric acid in adult frog	b) Urea in adult frog and	ammonia in tadpole	
	c) Urea in tadpole as well as in adult frog	d) Urea in tadpole and an	nmonia in adult frog	
87.	Acceossory excretory organs are			
	I. skin II. lungs			
	III. liver IV. sebaceous gland			
	Choose the correct option			
	a) I and II b) II and III	c) III and IV	d) I, II, III and IV	
88.	Erythropoietin is secreted from			
	a) Pituitary gland b) Pancreas	c) Adrenal gland	d) Kidney	
89.	A fall in GFR activateA to releaseB, which co	nverts angiotensinogen in	blood toC and further to	
	D			
	Choose the correct option for A, B, C, D from given o	ptions		
	a) A-JG cells, B-renin, C-angiotensin-I, D-angiotensir	I-II		
	b) A-renin, B-JG cells, C-angiotensin-I, D-angiotensir	I-II		
	c) A-renin, B-JG cells, C-angiotensin-II, D-angiotensi	n-I		
	d) A-JG cells, B-angiotensin, A-renin-I, D-angiotensin	n-II		
90.	The human kidney			
	a) Is responsible for the storage of nutrients such as	glycogen		
	b) Concentrates the urine by actively transporting water out of the filtrate			
	c) Produces more dilute urine when the collection d	ucts become less permeab	le to water	
	d) Responds to antidiuretic hormone by increasing	urine output		
91.	The excretory material of bony fish is			
	a) Urea b) Protein	c) Ammonia	d) Amino acid	
92.	The urine is			
	a) Hypotonic to blood and isotonic in medullarly flu	id		
	b) Hypertonic to blood and isotonic to medullarly fl	uid		
	c) Isotonic to blood and hypotonic to medullarly flu	id		
~~	d) Isotonic to blood and hypertonic to medullarly flu	lid		
93.	I. ADH			
	II. Renin-angiotensin			
	IV. Counter – current mechanism which			
	Choose the option containing factors, which regulat	es the osmoregulation of bo	Day fluids?	
04	a) I, II and III D) II, III and IV	CJ I, II and IV	d) All of the above	
94.	Counter current mechanism neips to maintain a con	tubula and thereby concern	radient neip in	
	a) Easy passage of water from medulla to collecting tubule and thereby concentrating urine			
	b) Easy passage of water from modullary interstition	fluid to collecting tubulo a	nd thereby diluting uring	
	c) Easy passage of water from medullary interstitial fluid to collecting tubule and thereby diluting urine			
	formed	ting tubule and medulia an		
95.	Choose the correct statement			
	I. Renal artery transport blood to kidney			
	II. Loop of Henle concentrate urine	_		
	III. Podocytes occur in inner wall of Bowman's caps	ıle		
	IV. Ultrafiltrate is blood plasma minus protein			
	a) I, II and III b) I, II and IV	c) I, II and IV	d) None of these	
96.	While urine formation progress, which of the follow	ing process takes place in t	the region labelled as A, B, C	
	and D in the given diagram?			

8		
A		
2		
a) A-collection of urine, B-secretion C-Reabsorptic	on, D-Pressure intration	
c) A-Pressure filtration B-Secretion C-Beabsorptic	DI, D-Collection of urine	
d) A-Reabsorption, B-Secretion C-Pressure filtration	on, D-Collection of urine	
97. Which one is the component of ornithine cycle?		
a) Ornithine, citrulline and fumaric acid	b) Ornithine, citrulline an	d arginine
c) Ornithine, citrulline and alanine	d) Amino acids are not us	ed
98. Collecting duct of nephron extends kidney from co	rtex to	
a) Capsule region	b) Inner part of medulla	
c) Outer part of medulla	d) Middle part of medulla	
99. Kidney stones are produced due to deposition of u	ric acid and	
a) Silicates b) Minerals	c) Calcium carbonate	d) Calcium oxalate
100. Anuria is failure of		,
a) Kidney to form urine	b) Tubular secretion in ki	dney
101 Choose the correct order of urine formation in hur	a) I ubular reabsorption I	n klaney
101. Choose the correct of def of this formation in hu 2) PCT $\rightarrow \Delta I H \rightarrow DI H \rightarrow DCT \rightarrow CD$	h) ACH \rightarrow DI H \rightarrow PCT \rightarrow C)́СТ → СП
c) PCT \rightarrow DLH \rightarrow ALH \rightarrow DCT \rightarrow CD	d) CD \rightarrow DCT \rightarrow ACH \rightarrow DI	$H \rightarrow PCT$
102. Consider the following statements		MI / 101
I. Flame cells are excretory structures in flatworm	S.	
II. Green glands are excretory organs in annelids.		
III.Columns of Bertini are the conical projections o	f renal pelvis into renal medu	ılla between the renal
pyramids.		
a) I and II correct b) II and III incorrect	c) I and III correct	d) I, II and III correct
103. Arrange the following parts of the nephron in a sec	quential manner and select th	ne correct option
accordingly		
l. Glomerulus		
II. Bowman's capsule		
III. Henre's loop		
V Collecting duct		
VI. Distal convoluted tubule		
a) $I \rightarrow II \rightarrow III \rightarrow IV \rightarrow V \rightarrow VI$ b) $I \rightarrow II \rightarrow IV \rightarrow III \rightarrow VI \rightarrow V$	c) I→II→IV→III→V→VI	d) VI→III→II→I→VI→V
104. The outline of principal event of urination is given	below in unorder manner	,
I. Stretch receptors on the wall of urinary bladder	send signal to the CNS	
II. The bladder fills with urine and becomes disten	ded	
III. Micturition		
IV. CNS passes on motor messenger to initiate the	contraction smooth muscles of	of bladder and
simultaneous relaxation of urethral sphincter		
The correct order of steps for urination is		
aj $II \rightarrow I \rightarrow IV \rightarrow III$ DJ $IV \rightarrow III \rightarrow II \rightarrow I$ 105 Malnighian tubulas are the everetory structures of	¢j 11→1→111→1V	uj III→II→I→IV
105. Maipignian tubules are the excretory structures of		

a) Insects b) Mammals 106. The first step in the urine formation is the filtration B On an averageC mL of blood is filtered by blood pumped out by each ventricle of the heart in a Choose the correct options for the blanks A to D to c a) A-glomerulus; B-filtration, C-800-900, D $-\frac{1}{4}$ th	c) Birds of the blood, which is carrie y kidneys per minute, which minute. omplete the given NCERT s	d) Reptiles ed by theA and is called h constitutesD of the statement
b) A-glomerulus; B-filtration, C-1100-1200, D – $\frac{1}{2}$ th		
c) A-glomerulus: B-filtration. C-1100-1300. D $-\frac{1}{2}$ th		
d) A glomorphus: P filtration C 1100 1500, D $\frac{1}{6}$ th		
107 Choose the correct ones		
I. Vasa recta is lacking in cortical nephrons II. Maximum number of nephrons in kidney are juxta III. DCT of many nephorns open into collecting tubul IV. During summer when body loses lot of water by o V. When someone drinks lot of water, ADH release is VI. Exposure to cold temperature stimulates ADH re VII. An increase in glomerular blood flow stimulates The correct option is	a-medullary type le evaporation, the release of s suppressed lease formation of angiotensin I	f ADH is suppressed I
a) All except I and IV b) All except V and VII	c) All except I and V	d) All except II and VI
108. All Bowman's capsules of the kidney are found in		
a) Pelvis b) Medulla	c) Cortex	d) None of these
 a) Three times concentrated than initial filtrate b) Four times concentrated than initial filtrate c) Five times concentrated than initial filtrate d) Six times concentrated than initial filtrate 		
110. ANF (Anti Natriuretic Factor) is released by		
a) Lung b) Kidney	c) Heart	d) All of the above
111. Mammals excrete		
a) Urea b) Uric acid	c) Ammonia	d) All of these
112. Medullary gradient is mainly developed due to	h) No Claude shares	
a) Naci and urea	d) Ammonia and glucose	
113 An adult human excretes on an average	uj Allinollia allu giucose	
a) 2-3 litres of urine per day	b) 1-1.5 litres of urine pe	r dav
c) 2-5 litres of urine per day	d) 4-5 litres of urine per of	dav
114. Angiotensin-II activates theA and releaseB		
Choose the correct option for A and B to complete the	ne given statement	
a) A-adrenal cortex; B-aldosterone	b) A-adrenal medulla; B-a	aldosterone
c) A-adrenal capsule; B-aldosterone	d) A-adrenal medulla; B-o	oxytocin
115. I. Ureter II. Renal pelvis, III. Calyx IV. Urinary b	ladder V. Urethra	
Choose the correct sequence of urine route to outsid	le	
a) $I \rightarrow II \rightarrow III \rightarrow IV \rightarrow V$ b) $V \rightarrow IV \rightarrow III \rightarrow II \rightarrow I$	c) V→III→IV→I→II	d) III→II→I→IV→V
116. Loop of Henle is associated with		
a) Excretory system b) Respiratory system	c) keproductive system	a) Digestive system
 a) Ammonia (NH⁺₄ ions) affect the brain cell function b) Ammonia is not very toxic to the other cell than b 	ning by changing polarity o rain cells	f cell membrane

c) Ammonia is highly stable in brain cells	c) Ammonia is highly stable in brain cells			
d) Ammonia penetrate the cell membrane of brain (Cells			
118. Nacl is transported by ascending limb of Henle's loc	op, which is exchanged with	1		
	b) PCT			
c) Ascending limb of vasa recta	d) Descending limb of va	sa recta		
119. Which one is related to urine concentration in mam	mais?			
a) Testosterone normone	d) All of these			
c) Oxytocin normone	d) All of these			
L Internal fortilisation				
I. Internal fertilisation				
III. Four chamber beart				
IV II reotalic excretion				
V Lungs are organ of respiration				
The correct ontion is				
a) Land III b) II and IV	c) II and IV	d) Only IV		
121. A child has single kidney since hirth. This variation	is	uj oliny iv		
a) Hybridization b) Negative meristic	c) Blastogenic	d) Substantive		
122. Haemodialysis helps in patient having	ej Blabeogenie	ajoubbuillite		
a) Anaemia b) Uremia	c) Goitre	d) Diabetes		
123. IGA (Juxta Glomerular Apparatus), a sensitive regio	n. which regulates the glon	nerular filtration rate is		
present near the	,			
a) DCT and PCT	b) DCT and efferent arter	riole		
c) DCT and afferent arteriole	d) Loop of Henle's and D	тс		
124. Choose the correct statements				
I. Kidney transplantation is the ultimate method at the stage where drug or dialysis do not help				
II. Close relatives are often used as kidney donors to	o minimise risk of rejection			
III. Cylosporin-A is used as immunosuppressive age	nt in kidney transplant pat	ient		
IV. Heparin and antiheparin are used in haemodialy	rsis			
Choose the correct option				
a) I, II and III b) IV, III and II	c) I, III and IV	d) I, II, III and IV		
125. What is glycosuria?				
a) Low amount of sugar in urine	b) Low amount of fat in ι	irine		
c) Average amount of carbohydrate in urine	d) High amount of cugar			
	uj mgn amount or sugar	in urine		
126. An organism which don't have loop of Henle will ex	crete	in urine		
a) No urineb) Dilute urine	crete c) Concentrated urine	d) No change in urine		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform 	crete c) Concentrated urine ner vertebrate?	d) No change in urine		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 	crete c) Concentrated urine ner vertebrate? c) Bird	in urine d) No change in urine d) None of these		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on 	crete c) Concentrated urine ner vertebrate? c) Bird	d) No change in urine d) None of these		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 120. On with increase of the open set of the papilla 	 c) Find another of sugar c) Concentrated urine ner vertebrate? c) Bird c) Duodenum 	 d) No change in urine d) None of these d) DCT 		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic c) Ornithine cycle refers to the sequence of biochemic 	 c) Fight another of sugar c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in 	 d) No change in urine d) None of these d) DCT the d) Stomash 		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 	 c) Fight another of sugar c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas 	d) No change in urine d) None of these d) DCT the d) Stomach		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Honlo's loop 	 c) Fight another of sugar c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Provimal convoluted to the second sec	d) No change in urine d) None of these d) DCT the d) Stomach		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Henle's loop c) Distal convoluted tubulo 	 c) Fight another of sugar c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Proximal convoluted t d) Asconding limb of Hor 	d) No change in urine d) None of these d) DCT the d) Stomach		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Henle's loop c) Distal convoluted tubule 131. Facultative water reabsorption is 	 d) High anothe of sugar crete c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Proximal convoluted t d) Ascending limb of Her 	d) No change in urine d) None of these d) DCT the d) Stomach subule hle's loop		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Henle's loop c) Distal convoluted tubule 131. Facultative water reabsorption is a) Reabsorption of water in PCT through ADH 	 d) High anothe of sugar crete c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Proximal convoluted t d) Ascending limb of Her 	d) No change in urine d) None of these d) DCT the d) Stomach subule hle's loop		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Henle's loop c) Distal convoluted tubule 131. Facultative water reabsorption is a) Reabsorption of water in PCT through ADH b) Reabsorption of water in Loop of through ADH 	 d) High anothe of sugar crete c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Proximal convoluted t d) Ascending limb of Her 	d) No change in urine d) None of these d) DCT the d) Stomach subule hle's loop		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Henle's loop c) Distal convoluted tubule 131. Facultative water reabsorption is a) Reabsorption of water in PCT through ADH b) Reabsorption of water in Loop of through ADH c) Reabsorption of water in DCT and CT through ADH 	 d) High anothe of sugar crete c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Proximal convoluted t d) Ascending limb of Her 	d) No change in urine d) None of these d) DCT the d) Stomach subule hle's loop		
 126. An organism which don't have loop of Henle will ex a) No urine b) Dilute urine 127. Which among the following is the only osmoconform a) Rabbit b) Hagfish 128. Duct of Bellini opens on a) Ureter b) Renal papilla 129. Ornithine cycle refers to the sequence of biochemic a) Oral cavity b) Liver 130. In the nephron of rabbit, reabsorption of glucose oc a) Descending limb of Henle's loop c) Distal convoluted tubule 131. Facultative water reabsorption is a) Reabsorption of water in PCT through ADH b) Reabsorption of water in Loop of through ADH c) Reabsorption of water in DCT and CT through AIH 	 d) High anount of sugar crete c) Concentrated urine ner vertebrate? c) Bird c) Duodenum al reactions taking place in c) Pancreas curs in b) Proximal convoluted t d) Ascending limb of Her DH 	d) No change in urine d) None of these d) DCT the d) Stomach subule hle's loop		



a) 1.010-1.015	b) 1.015-1.020	c) 1.020-1.025	d) Both (a) and (b)		
142. During hemodialysis process					
I. blood drained from a	convenient artery and anti-	coagulant is added (hepari	in)		
II. removal of nitrogen	II. removal of nitrogenous waste from blood				
III. blood is passed thro	III. blood is passed through a coiled porous cellophane membrane of tube bathing in dialysis fluid				
IV. blood is mixed with antiheparin and passed into vein					
Arrange the steps					
a) I→II→III→IV	b) IV→III→II→I	c) I→III→II→IV	d) I→IV→II→III		
143. The renal fluid isotonic	to the cortical fluid and blo	ood is found in			
a) The collecting duct a	and ascending limb				
b) The distal convolute	d tubule and ascending lim	b			
c) The proximal convo	luted tubule and distal conv	voluted tuble			
d) The ascending limb	and descending limb				
144. Which one of the follow	ving statements is false?				
a) Presence of albumin	in urine is albuminuria				
b) Presence of glucose	in urine is glycosuria				
c) Presence of ketone s	sugar in urine is Ketonuria				
d) Presence of excess u	rea in blood is uremia				
145. I. Reabsorption of wate	r occurs passively in the ini	itial segment of nephron			
II. Nitrogenous waste a	re absorbed by active trans	port			
III. Conditional reabsoi	'ption of Na' and water take	es place in DCT			
IV. DCT reabsorbs gluc	ose				
V. DUT is capable of sel	ective secretion of H ⁺ , K ⁺ a	nd NH_3 to maintain pH and	d Na' – K' balance in blood		
VI. Substances like glud	cose, amino acids, Na ⁺ , etc, i	in the filtrate are reabsorb	ed actively		
Choose the option with	incorrect statements		1) II III		
a) I and II	b) III and IV	c) v and vi	d) II and IV		
146. Each nephron has two	parts, which are	h) Classical and ann			
a) Bowman's capsule a	na P C I	d) Boumerulus and ren	al tubule		
147 Identify the correct sta	tomonto	uj dowinali s capsule a	nu renai tubule		
I The outer layer of the	kidney is called cansule				
I. The outer layer of the	o outer cortex and inner me	dulla			
III. Medulla is divided in	nto medullary pyramids	cuulla			
IV The cortex extends	in between the medullary n	wramids which is called as	columns of Bertini		
Choose the correct ont	ion accordingly	yrannus which is cance as	columns of Dertim		
a) I III and IV	h) L and IV	c) I II and III	d) I II III and IV		
148. Out of the four parts gi	ven below, which parts play	v significant role in forming	concentrated urine in		
human?	ven berett) which pure pray				
L Loop of Henle					
II. Glomerulus					
III. Bowman's capsule					
IV. Vasa recta					
The correct option is					
a) I and II	b) III and IV	c) II and III	d) I and IV		
149. Aldosterone causes con	nditional reabsorption of	. in the distal part of tubul	e ,		
a) CO_2	b) Ca ²⁺	c) Na ⁺	d) Cl [_]		
150. Alkaptonuria is a cond	ition in which	2			
a) Accumulation of hor	nogenestic acid in blood	b) Excretion of homoge	enestic acid in sweat		
c) Excretion of homoge	enestic acid in urine	d) All of the above			
151. Sweat produced by sw	eat glands is a watery fluid	which contain			
-	-				

a) NaCl b) Urea	c) Lactic acid	d) All of the above
152. GFR (Glomerular Filtration Rate) is the amount of fil	trate formed by the kidney	y per
a) Hour b) Second	c) Minute	d) 10 seconds
153. Ammonia produced by metabolism is convered into	theA in theB in ure	eotelic and released into the
blood, which is filtered and excreted out byC		
Choose the appropriate options for A, B and C to com	plete the given NCERT sta	tement
a) A-uric acid, B-spleen, C-kidney	b) A-uric acid, B-liver, C-k	sidnev
c) A-urea, B-liver, C-kidney	d) A-urea, B-spleen, C-kid	lnev
154. How much percentage of the filtrate is reabsorbed in	the renal tubules?	5
a) 5% b) 25%	c) 90%	d) 99%
155. Which one of the following statements is correct wit	h respect to salt water bala	ince inside the body of
living organisms?		
a) When water is not available camels do not produc	e urine but store urea in ti	ssues
h) Salmon fish excretes lot of stored salt through gill	membrane when in fresh	water
c) Paramecium discharges concentrated salt solution	in by contractile vacuoles	water
d) The body fluids of freshwater animals are general	ly hypotonic to surroundir	ng water
156 Find the correct ontion regarding mechanism of urin	o formation in man	
a) The domerular filtration rate is about 125 mJ /mi	n	
b) The ultra filtration is opposed by the colloidal osp	notic pressure of plasma	
c) Tubular socration takes place in the PCT	for pressure of plasma	
d) Aldostorono induses greater reabsorption of sodi	177	
157 pH of uring (average pH) is	JIII	
a) 70 b) 65	a) 7 5	d) 6 0
d) 7.0 DJ 0.5	() 7.5 on	u) 0.0
a) PMD increases	b) DBC collanges and unin	a production in grades
a) DMR IIICLEASES	d) DMD dogrades	le production increases
150 Laws and the function in A from collection decreases	a) BMR decreases	
159. Large amount of water IsA from collecting duct to	o produceB urine. This	segment allows passage of
small amounts ofC Into interstitium of medulla to	o keep up the osmolarity.	
Here, A, B and C refers to		NTT
a) A-secreted, B-dilute, C-sugar	b) A-secreted, B-dilute, C-	·NH ₃
c) A-secreted, B-dilute, C-urea	d) A-reabsorbed, B-conce	entrated, C-urea
160. l. Glucose		
II. Amino acid		
III. Na ⁺		
IV. Nitrogenous waste		
Which of them reabsorbed actively in the nephron?		
Choose the correct option		
a) I and II b) I, II and III	c) I and III	d) Only I
161. Reabsorption of water in DCT and CT part of nephro	n is function of	
a) Prolactin	b) Oxytocin	
c) Vasopressin	d) Luteinising hormone	
162. Choose the false statement		
a) Tubular cells secretes H ⁺ , K ⁺ , ammonia to filtrate		
b) Tubular cells helps to maintain the acid base bala	nce of the body fluid	
c) Tubular cells helps in ionic balance		
d) Tubular secretion is not very important step in ur	ine formation	
163. In micturition,		
a) Urethra relaxes b) Ureter relaxes	c) Ureter contracts	d) Urethra contracts
164. Haemodialysis is associated with		
a) Liver b) Spleen	c) Kidney	d) Stomach

165. Glomerular filtrate is		
a) Blood minus blood corpuscles and plasma protein	n	
b) Blood minus corpuscles		
c) Mixture of water, ammonia and corpuscles		
d) Urine		
166. ANF mechanism checks on		
a) Oxytocin – renin mechanism	b) Counter – current med	chanism
c) Renin – angiotensin mechanism	d) Oxytocin – angiotensii	n mechanism
167. Urine formed by nephornes is ultimately carried to	A where at stored fill a	voluntary signal is given by
theB This signal is initiated byC of urinary	bladder as it gets filled wit	h urine.
Choose the correct option for A, B and C to complete	e the given NCERT stateme	nt
a) A-urethra, B-CNS, C-PNS	b) A-urinary bladder, B-0	CNS, C-stretching
c) A-urethra, B-CNS, C-stretching	d) A-urethra, B-CNS, C-A	NS
168. Renal portal system is		
a) Present in all vertebrates	b) Present in all chordate	es
c) Absent in mammals	d) Present in all mamma	ls
169. Which of the following features activates the JG cells	5?	
I. Fall in GBR II. Fall in GBF		
III. Fall in GFR		
Choose the correct option		
a) I and II b) II and III	c) I and III	d) I, II and III
170. In majority, juxta-medullary nephrons are found in	the kidney of	
a) Kangaroo rat b) Camel	c) Both (a) and (b)	d) Fishes
171. Renal calculi is		
a) Soluble mass of crystallised salts in kidney	b) Soluble mass of protei	in in kidney
c) Insoluble mass of proteins in kidney	d) Insoluble mass of crys	tallised in kidney
172. Our lungs releas		
a) 18 L of O ₂ every day	b) 18 L of CO ₂ every day	
c) 10 L of CO ₂ every day	d) 10 L of O ₂ every day	
173. Layers between the glomerular and Bowman's caps	ule through which the filtra	ation takes place are
I. endothelium of the glomerular blood vessel		
II. middle lamella		
III. basement membrane between the endothelium of	of glomerular blood vessels	s and epithelium of the
Bowman's capsule		
IV. epithelium of the Bowman's capsule		
a) I, II and III b) II, III and IV	c) I, III and IV	d) I, II and IV
174. The conversion of dangerous nitrogenous waste interview.	o less toxic excretory matte	er is carried out in man in
the		
a) Blood b) Liver	c) Kidney	d) Skin
175. Osmoreceptores in the body is activated by the char	iges in	
I. blood volume		
II. body fluid volume		
III. ionic concentration		
The option containing correct statements is		
a) I and II b) I and III	c) III and II	d) All of these
176. Choose the mismatched part of nephron with their f	function	
a) Bowman's capsule – Glomerular filtration	b) PCT – Aeabsorption of	f Na ⁺ and K ⁺
c) DCT – Aeabsorption of glucose	d) Loop of Henle – Urine	concentration
177. On an average the amount of urea in gram excreted	out per day is	
a) 25-30 gm b) 30-35 gm	c) 20-25 gm	d) 35-40 gm

178. Uremia is accumulation of urea in	a) Kidnau	d) Dono iointo
a) Liver b) Blood	CJ Kluney	a) Bone joints
and IV. Then choose the correct option from the cod	les given below	ne given statement i, ii, iii
	0	
I. Podocyte are present through which filterate gene	erated	
II. Glomerulus filtrate is concentrate in descending l	limb of loop of Henle	
III. Glomerular filtrate is diluted in ascending limb o	of loop of Henle	
IV. Juxtra-glomerular apparatus is found		
codes		
A B C D		
a) I II III IV	b) I II IV III	
c) II III I IV	d) III II IV I	
180. Urine formation involves		
I. glomerular filtration		
II. tubular readsol ption		
Choose the correct option for the above statements		
a) Land II b) II and III	c) Land III	d) I II and III
181 The shape of vasa recta is		uj i, ii aliu ili
a) L-shaped b) U-shaped	c) S-shaped	d) I-shaped
182. Animal which excrete urea, produced during metab	olism of amino acid, belong	ts to
a) Ureotelism b) Uricotelism	c) Ammonotelism	d) Aminotelism
183. RASS secretes which of the following hormone?	-	
a) Mineralocorticoids b) Glucocorticoids	c) Both (a) and (b)	d) None of the above
184. Choose the correct statement		
I. Flame cell is a specialised excretory organ in flatw	/orms	
II. Bundles of flame cells are called protonephridia.		
The correct option is		
a) Only I b) Only II	c) I and II	d) Neither I nor II
185. Which term is used both for a part of kidney and a p	part of skeleton in the mam	mals?
a) Centrum b) Pelvis	c) Cortex	d) Medulla
186. Excretion of bile pigments in the urine indicates		
a) Rickets b) Jaundice	c) Diabetes	d) Anaemia
187. The proximity between Henle's loop and vasa-recta	as well as the counter curr	Tent in them help in maintain P_{1} with a contain
anA In molarity towards inner interstitium med to shout $C = m mol^{-1}$ in the inner modulle	iuliary, region, <i>i.e.</i> , from	B mos mol ⁻² in the cortex
to about		
a) $A_{increasing} = B_{-500} C_{-800}$	b) A-decreasing B-300 (°₋1200
c) A-decreasing B-1200 C-300	d) A-increasing R-200 C	-1200
188 Out of	a_j in mer casing, D^-300 , C	1200
I. PCT II. DCT		
III. Loop of Henle IV. Collecting duct		

Which contributes most in maintaining pH of blood]?				
a) I and II b) II and III	c) III and IV d) I and IV				
189. A man takes large amount of proteins. He is likely t	o excrete a greater amount	of			
a) Urea b) Uric acid	c) Sugar	d) None of these			
190. Excretion means					
a) Formation of those substances which have some	e role in the body				
b) Removal of such substances which have never b	een part of the body				
c) Removal of useless substances and substances p	resent in excess				
d) All of the above					
191. Renin is released by					
a) Hypothalamus	b) Posterior lobe of pitui	tary			
c) Anterior lobe of pituitary	d) J G cells				
192. If Henle's loop were absent from mammalian neph	ron, which of the following	is to be expected?			
a) The urine will be more concentrated					
b) The urine will be more dilute					
c) There will be no urine formation					
d) There will be hardly any change in the quality ar	nd quantity of urine formed				
193 PCT is lined by					
a) Cuboidal epithelium	h) Squamous enithelium				
c) Columnar epithelium	d) Stratified enithelium				
104. Which of the following disorder is an outcome of ir	regularities in metabolism	of the nitrogenous waste?			
a) Octooporocis	b) Courts orthritic				
a) Osteroportosis	d) Dhoumataid orthritic				
C) Osterioar unificial 105 Juntaglamanular calla of ranal contau sunthaciza an	u) Kileulliatoiti ai tiliitis				
195. Juxtagiomerular cells of renal cortex synthesize an	enzyme called				
a) ADH b) Oxytocin	c) Rennin	a) Urochrome			
196. In majority of nephrons, the loop of Henley's is four	nd in the				
a) Cortical region of the kidney	b) Medullary region of th	ie kidney			
c) Both (a) and (b)	d) Pelvis region of the ki	dney			
197. Osmoregulation is the function of					
a) Oxytocin b) ADH	c) Prolactin	d) Both (a) and (b)			
198. An increase in the body fluid volume can switch off	theA andB the ADI	H release. In this way			
complete theC					
Choose the correct option for A, B and C					
a) A-osmoreceptors, B-increase, C-feedback	b) A-osmoreceptors, B-s	uppress, C-feedback			
c) A-kidney filtration, B-increase, C-feedback	d) A-kidney filtration, B-	suppress, C-feedback			
199. Which of the following is first formed nitrogenous	waste of vertebrate?				
a) NH ₂ b) Urea	c) NH ₃	d) NH ₄			
200. Urine is concentrated in which part of nephron					
a) CT b) PCT	c) Bowman's capsule	d) JGA			
201. The condition where urea accumulates in blood is					
a) Glycosuria b) Uremia	c) Ketonuria	d) Acidosis			
202. A bird excretes nitrogenous waste materials in the	form of				
a) Uric acid b) Ammonia	c) Urea	d) Amino acids			
203. In human, the waste products of nucleotide metabo	olism are excreted as				
a) Ammonia b) Uric acid	c) Urea	d) Amino acid			
204. Among ammonia. uric acid and urea: which one nee	eds the least amount of wat	er to excrete?			
a) Ammonia b) Uric acid	c) Urea	d) Both (b) and (c)			
205. I. Excess loss of water from body	,	, (-, (-)			
II. Hypothalamus					
III. Osmorecentors					

IV. ADH											
V. Neurohypophysis											
VI. Water reabsorption	VI. Water reabsorption DCT and CT										
VII. Prevention of diure	VII. Prevention of diuresis										
Arrange the given proce	esses in correct sequence for	r regulation in kidney									
a) I→II→III→IV→V→VI-	→VII	b) VII→VI→V→IV→III→I	II→I								
c) I→III→II→V→IV→VI-	→VII	d) I→III→II→IV→V→VII·	→VI								
206. Angiotensin-II being a p	owerfulA increase the g	glomerular blood pressure	and there byB								
Angiotensin-II also activ	vates the adrenal cortex to r	eleaseC									
Find the correct for A, E	and C										
a) A-vasodilator, B-GFR	, C-vasopressin	b) A-vasodilator, B-GFR,	C-aldosterone								
c) A-vasoconstrictor, B-	GFR, C-aldosterone	d) A-vasoconstrictor, B-	GFR, C- vasopressin								
207. Urine is concentrated in											
a) Kidney	b) Liver	c) Colon	d) Heart								
208. Which one of the follow	ing is not a part of a renal p	yramia:									
a) Hanlo's loop		d) Poritubular capillario	c								
200 Primary function of swe	at in humans is	uj rentubulai capiliarie	5								
a) Excretion	h) Cooling of skin	c) Both of (a) and (b)	d) Removal of urea								
210 Which of the following:	are secreted by liver?		uj kemoval ol ulca								
I Biliruhin	are secreted by fiver.										
II. Biliverdin											
III. Cholesterol											
IV. Degraded steroid ho	rmone										
V. Vitamin											
VI. Drug											
Choose the correct opti	on										
a) I, II, III and IV	b) II, III, IV and V	c) III, IV, V and VI	d) I, II, III, IV, V and VI								
211. Functions of ADH											
I. reabsorption of water	from distal tubules										
II. secretion of water fro	om distal tubules										
III. construction of bloo	d vessels										
IV. dilatation of blood v	essels										
V. increase the blood flo)W										
VI. decrease the blood f	low										
Choose the correct com	bination of given functions	from given option									
a) I, III, IV and V	b) I, IV and V	c) I, III and V	d) II, IV and VI								
212. Which of the following	s responsible for excretion	of dilute urine?									
a) More secretion of the	lasterano	b) Less secretion of vaso	opressin								
212 The size of filtration slit	iosterone	u) Less secretion of gluc	agon								
213. The size of initiation sin	b) 15 nm	c) 20 nm	d) 25 nm								
214 Indication of diabetes n	of 15 min	c) 20 mm	u) 25 mm								
a) Presence of glucose i	n urine	h) Presence of ketone bo	ndies in urine								
c) Presence of amino ac	rid in urine	d) Both (a) and (b)									
215. The vital morphological	and physiological units of r	nammalian kidnev are									
a) Ureters	······ ·····	b) Uriniferous tubule									
c) Nephridia		d) Seminiferous tubules									
216. If you take large amoun	t of protein then you will lik	kely to excrete large amoun	nt of the								
a) Uric acid	b) Urea	c) Ammonia	d) Amino acid								

217. Choose the correct optio I. Blood pumped back to	n from given options in re suitable artery	eferenced to haemodialysis	
II. Heparin is used after l	naemodialysis		
III. Nitrogenous waste ai	re removed by active tran	isport	
IV. The dialysis unit has	coiled cello phone tube		
V. Blood is pumped into	dialysing unit from the ar	tery	
The correct option is			
a) I, II and III	b) II, IV and V	c) III and IV	d) IV and V
218. Major nitrogenous waste	e product in ureotelic anir	nals like rabbit and other n	nammals is
a) Uric acid	b) Urea	c) Ammonia	d) Amino acids
219. Urea cycle was discovere	ed in		
a) 1940	b) 1945	c) 1950	d) 1932
220. Glomerular area of adre	nal cortex is responsible f	for	
a) Water and electrolyte	balance	b) Carbohydrate metab	oolism
c) Steroid and hormone	secretion	d) Blood pressure	
221. Filtration in Malpighian	body of the nephrons invo	olves	
a) One layer	b) Two layer	c) Three layer	d) Four layer
222. Podocytes are the cells p	resent in		
a) Cortex of nephron		b) Inner wall of Bowma	an's capsule
c) Outer wall of Bowman	n's capsule	d) Wall of glomerular c	apillaries
223. The characteristic that is	s shared by urea, uric acid	and ammonia is/are	
I. They are nitrogenous v	wastes.		
II.They all need very larg	ge amount of water for exe	cretion.	
III.They are all equally to	oxic.		
IV. They are equally in th	ie kidneys.		
a) I and III	b) I and IV	c) I, III and IV	d) I only
224. Uricotelic mode of passing	ng out nitrogenous waste	s is found in	
a) Birds and annelids		b) Amphibians and rep	tiles
c) Insects and amphibia	ns	d) Reptiles and birds	
225. Main function of glomer	ulus is		
a) Filtration of urine		b) Reabsorption of H ₂ C)
c) Reabsorption of Na ⁺		d) Concentration of uri	ne
226. The expulsion of urine fr	om the urinary bladder is	scalled	
a) Uricolysis	b) Micturition	c) Ornithine	d) None of these
227. Which one is not correct	?		
a) Humans-Ureotelic	b) Birds-Uricotelic	c) Lizards-Uricotelic	d) Whale-Ammonotelic
228. ADH is secreted by			
a) Anterior lobe of pituit	ary	b) Middle lobe of pituit	ary
c) Posterior lobe of pitu	itary	d) All of the above	
229. The function of Henle's l	oop is		
a) Passage of urine		b) Formation of urine	
c) Conservation of water	ſ	d) Filtration of water	
230. Choose the correct ones			
I. Afferent arteriole carri	es the blood away from th	ne glomerulus toward renal	vein
II. Efferent arteriole carr	ies the blood to glomerulເ	IS	
III. Podocytes form minu	te spaces (slit pores) for t	the filtration of blood into t	he Bowman's capsule
IV. In Henle's loop There	are most reabsorption of	the major substances from	the glomerular filtrate
V. Distal convoluted tubu	le reabsorption K ⁺ ions in	nto the surrounding blood	capillaries
The correct option is		-	
a) I, II and III	b) III, IV and V	c) Only III	d) Only IV

 231. Select the right option a) Nitrogenous excretory products are synthesised b) Nitrogenous excretory products are synthesised c) Nitrogenous excretory products are synthesised d) Nitrogenous excretory products are synthesised 	in kidney and eliminated in in kidney, and eliminated a in liver, and eliminated via	n liver Ilso bile juice
a) Nilogenous excretory products are synthesised	In liver eminated by Run	ey
232. Glomerulus is formed by		
a) Branch from renal vein	b) Uriniferous tubule	
c) Branch from renal artery	d) Coiling of proximal pa	rt of uriniferous tubule
233. In uremia condition the urea can be removed by a p	rocess called	
a) Haemolysis b) Haemodialysis	c) Dialysis	d) Micturition
234. Which is not correct with respect to human kidney?		
a) The peripheral region is called cortex and centra	l medulla	
b) Malpighian capsule are present in the cortex reg	ion	
c) Blood enters glomerulus through efferent arteric	oles	
d) The concave part of kidney is called hilus		
235. Composition of urine		
I. WaterA%		
II. UreaB%		
III. Uric acidC%		
IV. SaltD%		
Choose the right options for A, B, C and D from given	n options	
a) A-90; B-2.0; C-1; D-2	b) A-95; B-2.6; C-0.3; D-1	1.5
c) A-80; B-2.6; C-0.3; D-1.5	d) A-85; B-2.6; C-0.3; D-1	1.5
236. What happens in micturition?		
a) Contraction of smooth muscles of bladder	b) Relaxation of the uret	hral sphincter
c) Release of urine	d) All of the above	1
237. GFR is a healthy individual is	,	
a) 125 mL/min b) 150 L/day	c) 125 mL/sec	d) 135 L/dav
238. Longest loop of Henle is found in	-)	
a) Kangaroo rat b) Opossum	c) rhesus monkey	d) All of these
239. Most of the secretory product of liver ultimately pas	ss out along with	.,
a) Urine b) Digestive wastes	c) Urea	d) Sweat
240. Guano is	-)	·) - · · ·
a) Bird's nitrogenous excretion	b) Men's nitrogenous exc	cretion
c) Fish's nitrogenous excretion	d) Amphibian's nitrogen	ous excretion
241. An increase in blood flow to atria of heart can cause	release ofA causesB	and there by decrease the
blood pressure. ANF mechanism therefore acts as cl	hecks onC	, , , , , , , , , , , , , , , , , , ,
Here, A – C refers to		
a) A-ANF. B-vaso constrictor. C-renin-angiotensis m	echanism	
b) A-ANF. B-vasodilator. C-renin-angiotensin mecha	nism	
c) A-vasopressin, B-vasodilator, C-renin-angiotensi	n mechanism	
d) A-vasopressin, B-vaso constrictor, C-renin-angiot	tensin mechanism	
242. Which of the following statements is/are true?		
I. Urine is hypertonic in distal convoluted tubule.		
II. When the urine passes into the collecting tubule.	it becomes hypotonic.	
III IIrine is isotonic in proximal convoluted tubule		
IV. Urine becomes more and more hypotonic as it n	asses through the Henle's l	000.
a) I and IV b) I II and III	c) II and III	d) I only
243. Triazenes are derived from	-,	~, · · ····,
a) Uric acid b) Urea	c) Ammonia	d) None of these
	- ,	-,

244. The human kidney has about					
a) One million nephrons	b) Two million nephrons				
c) Three million nephrons	d) Ten million nephrons				
245. In ornithine cycle, which of the following wastes ar	e removed from the blood?				
a) Urea and urine	b) Ammonia and urea				
c) Carbon dioxide and ammonia	d) Carbon dioxide and u	rea			
246. Which one of the following groups of structures/or	gans have similar function?	?			
a) Typhlosole in earthworm, intestinal villi in rat a	nd contractile vacuole in Ar	noeba			
b) Nephridia in earthworm, Malpighian tubules in o	cockroach and urinary tubu	les in rat			
c) Antennae of cockroach, tympanum of frog and cl	itellum of earthworm				
d) Incisors of rat, gizzard (proventriculus) of cockr	oach and tube feet of starfis	sh			
247. Reabsorption of glucose occurs in of the nephro	n				
a) Loop of Henle b) PCT	c) DCT	d) Collecting duct			
248. Read the statements given below					
I. Reabsorption in this region in minimum					
II. This region plays a significant role in the mainter	nance of high osmolarity of	intestinal fluid			
III. Its descending limb is permeable to water but a	most impermeable to elect	rolytes			
IV. Its ascending limb is impermeable to water but	allows transport of electrol	yte actively or passively			
V. In descending limb filtrate is hypertonic, while ir	ascending limb filtrate is h	iypotonic			
The above characteristics are associated with					
a) PCT b) Loop of Henle's	c) DCT	d) Bowman's capsule			
249. In 24 hours, total glomerular filtrate formed in the	human kidney is				
a) 1.7 litres b) 7 litre	c) 17 litres d) 170 litres				
250. Bowman's capsule is found in					
a) Glomerulus	b) Uriniferous tubule				
c) Nephron	d) Malpighian capsule				
251. Glucose is mainly absorbed in					
a) PCT b) DCT	c) Henle's loop	d) Nephron			
252. PCT helps in the maintenance of pH in the body flui	d by				
a) Selective secretion of H ⁺ ions	b) Selective secretion of	ammonia			
c) Selective secretion of K ⁺ ions	d) All of the above				
253. Blackening of urine, when exposed to air is a metab	olic disorder in human bei	ngs. This is due to			
a) Phenylalanine	b) Tyrosine				
c) Valine replacing glutamine	d) Homogentisic acid				
254. Many freshwater animals cannot live for long in sea	a water and <i>vice versa</i> mai	nly because of the			
a) Change in N levels	b) Change in the levels of thermal tolerance				
c) Variations in light intensity	d) Osmotic problems				
255. The medullary gradient tis mainly caused by					
a) NaCl and urea b) H ⁺ and K ⁺	c) Urea and K ⁺	d) Urea and H ⁺			
256. The process of release of urine is called					
a) Micturition b) Sweatening	c) Defeciation	d) Perspiring			
257. The ascending and descending limb of Henle's loop	is a respectively lined by				
a) Squamous epithelium, cuboidal epithelium	b) Cuboidal epithelium, s	sequamous epithelium			
c) Ciliated epithelium, sequamous epithelium	d) Cuboidal epithelium, o	ciliated epithelium			
258. Malpighian tubules are					
a) Excretory organs of insects	b) Excretory organs of fr	og			
c) Respiratory organs of insects	d) Endocrine glands of ir	nsects			
259. Study the given structure and match A, B, C, D, E, F	and G with correct option				

Bowman's B		
Ascending		
G		
a) A-Afferent arteriole, B-Proximal convulated tubu	ile, C-Henle's loop, D-Dista	l convulated tubule, E-
Peritubular capillaries, F-Collecting duct, G-Vasa	recta T. F. Dovitubulov conillovice	a E Callesting duct C Vaca
b) A-Ellerent arteriole, B-PC1, C-Henle's loop, D-DC	, i , E-Peritubular capillaries	s, F-Conecting duct, G-vasa
c) A-Afferent arteriole B-Peritubular capillaries C-	Henle's loop D-DCT F-PC	T F-Collecting duct G-Vasa
recta	freme s 100p, <i>D</i> - <i>D</i> e1, E-1 e	r, r-concerning duct, d-vasa
d) A-Afferent arteriole, B-Henle's loop, C-Collecting	duct, D-PCT, E-DCT, F-Per	itubular capillaries, G-Vasa
recta 260 In juyta modullary pophrons		
200. III juxta-medunal y nepinons,	h) Loop of Henle is long	
c) I oon of Henle runs deen into the medulla	d) All of the above	
261 Choose the correct option from given statement	uj Ali ol tile above	
L Glomerular filtrationrate is 125 mL/min		
II. Ultrafiltration is opposed by colloidal osmotic pr	essure of plasma	
III. Tubular secretion takes place in loop in Henle	eccure or prasma	
IV. Tubular secretion takes place in glomerulus		
V. Aldosterone induces greater sodium reabsorptio	n	
The correct option is		
a) III, IV and V b) I, IV and V	c) I, II and V	d) I, II and III
262. Almost all the aquatic animals excrete ammonia as	the nitrogenous waste pro	duct. Which of the following
statements is not in agreement with this situation?		
a) Ammonia is easily soluble in water		
b) Ammonia is released from the body in gaseous s	tate	
c) Ammonia is highly toxic and needs to be elimina	ted as and when formed	
d) Ammonia gets converted into a less toxic form ca	alled urea	
263. Which one is the excretory organ in the following?		
a) Archaeocyte b) Choanocyte	c) Pinacocyte	d) Solenocyte
264. In cortical nephrons,	h) Loop of Hople is long	
a) the PCT is very long	d) Th DCT is short	
265 Other than kidney which of the following organs he	u) The DCT is short	ory wastes?
L Lungs		ory wastes:
II Liver		
III. Skin		
IV. Spleen		
Choose the correct option containing all correct or	gans	
a) I, II and III b) II, III and IV	c) I, III and IV	d) I, II and IV
266. The stage of ornithine cycle at which arginase enzy	me is used?	
a) Ornithine →citrulline	b) Arginine \rightarrow ornithine	
c) Citrulline →arginosuccinic acid	d) Ornithine →urea	
267. The structural unit of human kidney is		

Δ-

a) Nephron b) Ureter	c) Loop of Henle	d) Bowman's capsule			
268. Chick excrete their secretion in the form of a) Ammonia b) Urea	c) Uric acid	d) Crystal of guanine			
269. Which of the following organs synthesises urea?	,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
a) Duodenum b) Kidney	c) Liver	d) Pancreas			
270. Primary or main excretory organ in humans is	a) Vidnar	d) Calcon			
a) SKIII D) LUIIg 271 Which of the following is right statement?	c) Kluney	d) spieen			
I. Angiotensin-II. being a powerful vasoconstrictor	r, increases glomerular pres	ssure and thereby GFR			
II. Angiotensin-II activates the adrenal cortex to re	elease aldosterone				
III. Aldosterone promotes reabsorption of Na ⁺ and	d water from the DCT and (CT leading to an increase in			
GBP and GFR					
IV. ANF causes vasoconstriction					
Select right combination					
a) I, II and III b) I, II and IV	c) I, III and IV	d) II, III and IV			
272. Glomerular filtrate rate per day is	a) 170 I	d) 100 I			
a) 150 L D) 190 L 272 The munture of uninersy bladder is provented by	CJ 170 L	a) 180 L			
a) Pseudostratified enithelium	h) stratified columnar of	nithelium			
c) Stratified cuboidal enithelium	d) Transitional enitheli	um			
274 Glomerulonenhritis is	uj manshonar epithen	um			
a) Bleeding of glomeruli of kidney	b) Absence of glomerul	i of kidnev			
c) Inflammation of glomeruli of kidney	d) Inflammation of PCT of kidney				
275. Glomerular filtration occurs in Bowman's capsule	when	,			
Hydrostatic pressure of Net filtrate pressure blood	d in glomerulus is				
a) 70 mm Hg 10 mm Hg	b) 70 mm Hg 25 mm H	Ig			
c) 70 mm Hg 40 mm Hg	d) 70 mm Hg 30 mm H	Ig			
276. Choose the correct option containing compounds	of ornithine cycle from the	options given below			
a) Ornithine, citrulline and fumaric acid	b) Ornithine, citrulline	and alanine			
c) Ornithine, citrulline and arginine	d) Ornithine, citrulline	and tyrosine			
277. Sodium reabsorption from the distal tubule will be	e increased if there is an inc	crease in			
a) Plasma potassium concentration	b) Plasma volume				
c) Mean arterial pressure	a) Urine flow rate				
a) In kidneys, but eliminated mostly through liver	i iluillalis is syllulesizeu				
h) In kidneys as well as eliminated hy kidneys					
c) In liver and also eliminated by the same throug	h hile				
d) In the liver, but eliminated mostly through kidr	ievs				
279. Largest gland of our body is	- 9 -				
a) Spleen b) Lung	c) Liver	d) kidney			
280. A person who is on a long hunger strike and is sur	viving only on water, will h	ave?			
a) More sodium in his urine	b) Less amino acids in l	nis urine			
c) More glucose in his blood	d) Less urea in his urine	e			
281. A terrestrial animal must be able to					
a) Excrete large amounts of water in urine	b) Conserve water				
c) Actively pump out salts through the skin	d) Excrete large amoun	ts of salts in urine			
282. Human urine as compared to human blood is					
aJ Hypotonic DJ Hypertonic	cj isotonic	a) All of these			
203. WUIIIIIIII DUUY IS AISU KIIUWII AS a) Pronenhros b) Maconenhros	c) Metanenhros	d) Abnormal heart			
	cj metallepill0s	uj nonormar nedi t			

284. Which one of the	following body functions is not	performed by kidneys?					
a) Excretion							
b) Osmoregulation							
c) Regulation of b	lood volume						
d) Destruction of	dead blood corpuscles						
285. Ultrafiltrate gener	rated by the glomerulus is havi	ng all the constituent of tl	ne blood plasma except				
a) Protein	b) RBC	c) WBC	d) All of these				
286. Which of the follo	wing is not an excretory organ	?					
a) Liver	b) Book lungs	c) Kidney	d) Hepatopancreas				
287. Podocytes are pre	esent on the						
a) Endothelial cel	ls of the glomerulus	b) Endothelial cells	of the Bowman's capsule				
c) Epithelium cell	s of the Bowman's capsule	d) Epithelium cells o	of the glomerulus				
288. The functioning o	f the kidneys is efficiently mon	itored and regulated by th	ie hormonal feedback				
mechanism involv	ving						
a) Hypothalamus	b) JGA	c) Heart	d) All of the above				
289. In which part of n	ephron, reabsorption is minim	um from filtrate?					
a) Henle's loop		b) Proximal convolu	ted tubule				
c) Distal convolut	ed tubule	d) Collecting duct					
290. Animal accumulat	es waste like urea, uric acid, Co	O_2 , H_2O , ions like Na^+ , K^+	, Cl [–] , phosphate, sulphate, etc., by				
a) Metabolic activ	ities b) Excess ingestion	c) Either (a) or (b)	d) Excretion				
291. Which of the follo	wing structures are situated in	the cortical region of the	kidney?				
I. Malpighian corp	ouscle						
II. PCT (Proximal	Convoluted Tubules)						
III. DCT (Distal Co	nvoluted Tubules)						
IV. Loop of Henle							
V. Collecting duct							
a) I, II and III	b) III, IV and V	c) II, III and IV	d) IV, V and I				
292. Normal level of un	ea in blood plasma is						
a) 80-100 mg/10	0 mL blood	b) 18-38 mg/100 m	b) 18-38 mg/100 mL blood				
c) 30-40 mg/100	mL blood	d) 1-10 mg/100 mL	d) 1-10 mg/100 mL blood				

NEET BIOLOGY

EXCRETORY PRODUCTS AND THEIR ELIMINATION

						: ANSV	V	ER K	EY	:					
1)	b	2)	а	3)	b	4)	b	153)	С	154)	d	155)	а	156)	С
5)	b	6)	d	7)	С	8)	С	157)	d	158)	b	159)	d	160)	b
9)	С	10)	d	11)	а	12)	d	161)	С	162)	d	163)	а	164)	С
13)	С	14)	С	15)	b	16)	d	165)	а	166)	С	167)	b	168)	С
17)	С	18)	b	19)	d	20)	d	169)	d	170)	С	171)	С	172)	b
21)	а	22)	С	23)	а	24)	d	173)	С	174)	b	175)	d	176)	С
25)	С	26)	d	27)	С	28)	b	177)	а	178)	b	179)	а	180)	d
29)	b	30)	d	31)	С	32)	d	181)	b	182)	а	183)	а	184)	С
33)	С	34)	b	35)	d	36)	b	185)	b	186)	b	187)	d	188)	а
37)	b	38)	d	39)	b	40)	b	189)	а	190)	С	191)	d	192)	b
41)	b	42)	а	43)	С	44)	С	193)	а	194)	b	195)	С	196)	а
45)	С	46)	а	47)	b	48)	С	197)	b	198)	b	199)	С	200)	а
49)	а	50)	d	51)	b	52)	а	201)	b	202)	а	203)	b	204)	b
53)	С	54)	С	55)	а	56)	b	205)	С	206)	С	207)	а	208)	а
57)	а	58)	С	59)	а	60)	С	209)	b	210)	d	211)	С	212)	b
61)	а	62)	С	63)	d	64)	С	213)	d	214)	d	215)	b	216)	b
65)	С	66)	С	67)	b	68)	а	217)	d	218)	b	219)	d	220)	а
69)	С	70)	а	71)	а	72)	d	221)	С	222)	b	223)	d	224)	d
73)	а	74)	С	75)	b	76)	b	225)	а	226)	b	227)	d	228)	С
77)	b	78)	а	79)	С	80)	С	229)	С	230)	а	231)	d	232)	b
81)	d	82)	d	83)	b	84)	С	233)	b	234)	С	235)	b	236)	d
85)	а	86)	b	87)	d	88)	d	237)	а	238)	а	239)	b	240)	а
89)	а	90)	С	91)	С	92)	b	241)	b	242)	d	243)	b	244)	а
93)	d	94)	b	95)	С	96)	b	245)	С	246)	b	247)	b	248)	b
97)	b	98)	b	99)	d	100)	а	249)	d	250)	d	251)	а	252)	d
101)	С	102)	b	103)	b	104)	а	253)	d	254)	d	255)	а	256)	а
105)	а	106)	b	107)	d	108)	С	257)	b	258)	а	259)	а	260)	d
109)	b	110)	С	111)	а	112)	а	261)	С	262)	b	263)	d	264)	а
113)	b	114)	а	115)	d	116)	а	265)	а	266)	b	267)	а	268)	С
117)	а	118)	d	119)	b	120)	d	269)	С	270)	С	271)	а	272)	d
121)	b	122)	b	123)	С	124)	d	273)	d	274)	С	275)	а	276)	С
125)	d	126)	b	127)	b	128)	b	277)	а	278)	d	279)	С	280)	а
129)	b	130)	b	131)	С	132)	С	281)	b	282)	b	283)	b	284)	d
133)	С	134)	b	135)	С	136)	d	285)	d	286)	d	287)	С	288)	d
137)	d	138)	d	139)	а	140)	b	289)	d	290)	d	291)	а	292)	b
141)	b	142)	С	143)	С	144)	b								
145)	d	146)	b	147)	d	148)	d								
149)	С	150)	С	151)	d	152)	С								

NEET BIOLOGY

EXCRETORY PRODUCTS AND THEIR ELIMINATION

: HINTS AND SOLUTIONS :

1 **(b)**

Haemodialyser is also known as blood dialyser or artificial kidney and is used in the condition of renal failure. During dialysis, the blood is taken form radial artery, mixed with heparin (anticoagulant) cooled to 0°C and passed through cellophane tubes of the disposable dialyser. The nitrogenous waste products are passed out into dialysing fluid through simple diffusion. Then purified blood is mixed with antiheparin and passed into radial vein.

2 **(a)**

Polyuria amount of urine passed out is more

3 **(b)**

Because these are ATP dependant substances whose movement occurs against concentration gradient. In active transport, ATP provided by mitochondria, provides energy needed to move these ions and molecules across the cell membrane

4 **(b)**

Urea is both nitrogenous product as well as osmoregulator. It is the excretory product in man and mammals, *Ascaris*, earthworm, fishes like sharks and string rays, etc.

5 **(b)**

Mostly aquatic arthropods, bony fishes, freshwater fishes, amphibian tadpoles, etc, excrete ammonia, *i. e.*, phenomenon called ammonotelism and the animal concerned is called **ammonotelic**.

6 **(d)**

Blood vessels, which supply blood to glomerulus is called the afferent arteriole and the outgoing or exit is done by efferent arteriole

7 **(c)**

The yellow colour of urine is due to the presence of pigment Urochrome. This pigment is formed by bile pigment bilirubin.

Bilirubin

↓ Liver

Intestine

 \downarrow

Urobilinogen

 \downarrow

Urochrome (Yellow pigment of urine)

8 **(c)**

Excessive loss of fluid activate the receptor, which stimulate hypothalamus to release the ADH from posterior lobe of pituitary. Facilitate the water reabsorption of water from the lateral part of tubule (DCT and CT)

9 **(c)**

Each kidney has nearly one million complex tubular structures called nephrons, which are called functional unit of kidney

10 **(d)**

In certain marine mollusus, crustaceans and teleost fishes, the excretory product is TMO (trimethylamine oxide). In these animals, ammonia is converted into **trimethylamine** (TMA) after its methylation. Thus, either TMA or its oxidation product **trimethyl oxide** (TMO) is the excretion product in these causes.

- 11 **(a)**
 - A Calyx
 - B Cortex
 - C Renal column
 - D Ureter

Effective Filtration Pressure (EFP) or Net Filtration Pressure (NFP) is glomerular blood hydrostatic pressure (GBHP) minus the colloidal osmotic pressure of blood (BCOP) and capsular hydrostatic pressure (CHP).

EFP/NFP = GBHP - (BCOP + CHP)

= 60 - (32 + 18)

= 10mmHg

13 **(c)**

Water is a high threshold substance. During selective reabsorption 99.5% of water is reabsorbed (active transport) and reabsorption takes place in loop of Henle.

14 **(c)**

The JGA plays a complex regulatory role. A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin, which converts angiotensin ogen in blood to angiotensin I and further to angiotensin-II. Angiotensin-II, being a powerful vasoconstrictor, increase the glomerular blood pressure and thereby GFR. Angiotensin-II also activates the adrenal cortex to release aldosterone. Aldosterone causes reabsorption of Na⁺ and water from the distal parts of the tubule. This also leads to an increase in blood pressure and GFR. This complex mechanism is generally known as the renin-angiotensin mechanism. An increase in blood flow to the atria of the heart can cause the release of Atrial Natriuretic Factor (ANF). ANF can cause vasodilation (dilation of blood vessels) and thereby decrease the blood pressure. ANF mechanism, therefore, acts as a

15 **(b)**

Passage of urine in humans is Glomerulus \rightarrow DCT \rightarrow Loop of Henle \rightarrow PCT \rightarrow Collecting tubule \rightarrow Ureter \rightarrow Bladder \rightarrow Urethra \rightarrow Outside

check on the renin-angiotensin mechanism

16 **(d)**

Excretion is the elimination of metabolic wastes from the body. Carbon dioxide is removed as a gas by respiratory organs. The common excretory product in man are CO_2 , minerals, salts, urea, water, pigments, etc. Uricotelism is found in those animals, which need water conservation. It is the elimination of uric acid and urates as the main nitrogenous wastes in the form of paste or in a semisolid state.

18 **(b)**

Juxta glomerular apparatus is a modification in afferent arteriole and distal convoluted tubule for regulation of osmoregulation in body

20 **(d)**

Renin angiotensin mechanism, vasopressin and juxta-glomerular apparatus autoregulate the GFR

21 **(a)**

Urea cycle takes place in liver cells with the hydrolytic enzyme arginase. Arginase splits Arginine into urea and ornithine with the elimination of a water molecule.

23 **(a)**

Levels of solubility of nitrogenous waste From higher to lower Ammonia > urea > uric acid Levels of toxicity Ammonia > urea > uric acid

24 **(d)**

The living steady state has a self-regulatory mechanism which is known as **homeostasis**.

25 **(c)**

Birds, reptiles and insects are uricotelic animals. These animals excrete uric acid as excretory product.

26 **(d)**

Both Aldosterone and ADH regulate volume of urine. ADH (antidiuretic hormone) stimulates the reabsorption of water through the distal convoluted tubule of the kidney nephron in mammals and thus, limits the water content and the overall volume of urine. Aldosterone, secreted from adrenal cortex, increases the reabsorption of sodium ions and water and the release of potassium ions in the collecting duct and DCT.

27 **(c)**

The yellow colour of urine is caused by the pigment urochrome, which is breakdown product of haemoglobin from worm out RBCs

28 **(b)**

Vasa-recta are the blood vessels running parallel to loop of Henle forming a counter current system

17 **(c)**

in juxta-medullary nephron. These are in the continuation of efferent arteriole. The slow blood flow of vasa-recta is responsible for maintaining the hyperosmolarity of interstitium fluid

29 **(b)**

Presence of ketones or acetone bodies in urine are due to metabolism of fatty acids instead of glucose during diabetes, starvation, fasting and pregnancy.

30 **(d)**

Loss of water from tissues results in the dehydration of cells.

31 **(c)**

Towards the centre of the inner concave surface of the kidney, there is a notch called hilum through which ureter, blood vessels and nerves enter. Inner to the hilum is a broad funnel-shaped space called the renal pelvis with the projections called calyces

32 **(d)**

Podocytes or visceral epithelial cells are the cells in Bowman's capsule in the kidney that wrap around the capillaries of glomerular. They create minute pores (site pores) for the filtration of blood into the Bowman's capsule.

33 **(c)**

Glomerular filtration occurs in Bowman's capsule when hydrostatic pressure of blood in the glomerulus is 70 mm Hg and net filtrate pressure is 10 mm Hg.

34 **(b)**

Urine is a transparent, light yellow liquid with a slightly acidic pH. The colour of urine is caused by the pigment **urochrome**, which is a breakdown product of haemoglobin from worn out a red blood corpuscles, while the pungent smell of urine is due to **urinode**.

35 **(d)**

The flow of blood through the two limps of vasa recta is in counter current pattern (opposite) The proximity between the Henle's loop and vasa recta as well as the counter current in them help in maintaining an increasing osmolarity toward the inner medullary interstitium. *i.e.,* from 300 mos mol L^{-1} in cortex to about 1200 mos mol L^{-1} in the inner medulla. This is also called medullary gradient

36 **(b)**

An adult man normally passes about 1 to 1.5 litres of urine in 24 hours. It contains about 30 g urea.

37 **(b)**

Abnormal catabolism of tyrosine causes melanuria. The excretion of urine of a dark colour resulting from the presence of melanin or other pigments, etc.

38 **(d)**

When someone drinks lot of water which is not required by body, the osmolarity of the blood will decrease. The decrease in osmolarity will inhibit the release of ADH.

39 **(b)**

As urea formation takes place in liver through ornithine cycle, the blood leaving liver and going towards heart has high amount of urea.

40 **(b)**

The formation of urea form NH_3 and CO_2 occurs in liver through ornithine cycle or Krebs Henseleit cycle.

41 **(b)**

Green glands are present at the base of the antennae of certain crustaceans. These glands help in excretion.

42 **(a)**

DCT (Distal Convoluted Tubule) Conditional reabsorption of Na⁺ and water takes place in this segment. DCT also capable of reabsorption of HCO_3^- and selective secretion of hydrogen and potassium ions and NH₃ to maintain the pH and sodium-potassium balance in blood

43 **(c)**

The tubular epithelial cells in different segments of the nephrons perform reabsorption either by active or passive mechanisms. For example, substances like glucose, amino acids, Na⁺ etc, in the filtrate reabsorbed actively whereas the nitrogenous wastes are absorbed by passive transport. Reabsorption of the water also occurs passively in the initial segments of the nephron Aldosterone causes the reabsorption of Na and water from distal part of tubule. This leads to the increase in Glomerular Filtration Rate (GFR)

45 **(c)**

Human excretory system consists of (i) a pair of kidney (ii) a pair of ureter (iii) urinary bladder (iv) urethra



46 **(a)**

Kidneys help in the formation of urine, from the blood flowing through glomerular capillaries. About 20% of plasma fluid filters out into the Bowman's capsule through a thin glomerularcapsular membrane due a net or effective filtration of about 10 to 15 mm Hg. So, the nearest option is (a).

47 **(b)**

The efferent arteriole is narrower as compared to afferent arteriole, hence a hydrostatic pressure develops in the glomerulus, which forces a large amount of water, entire glucose, all amino acid, urea, and salts of sodium potassium out of the glomerulus into the Bowman's capsule

48 **(c)**

Ascending limb of vasa recta.

The gradient of medullary region is primarily by NaCl and urea. NaCl is transported by ascending limb of Henle' loop which is exchanged with descending limb of vasa recta. Similarly small amount of urea enter the thin segment of the ascending limb of Henle's loop which is transported back to interstitium by collecting tubule. The above described transport of substances facilitated by special arrangement of Henle's loop and vasa recta is called counter current mechanism

49 **(a)**

- A Afferent Atriole
- B Efferent atriole
- C Bowman's capsule
- D Proximal convoluted tubule

50 **(d)**

Sebaceous glands eliminate certain substances like sterols, hydrocarbons and waxes through sebum. This secretion provides a protective oily covering for the skin. Small amounts of nitrogenous wastes could be eliminated through saliva

51 **(b)**

Hepatic vein has highest urea level because urea is synthesised in liver

52 **(a)**

Rennin is an enzyme which is released by Juxtaglomerular cells of kidneys when blood pressure becomes low. It plays an important role in reabsorption of sodium.

53 **(c)**

Main function of DCT is to maintain the pH and sodium-potassium balance in blood

54 **(c)**

Cockroach excretes uric acid as the chief nitrogenous excretory product. Man excrete urea as the chief nitrogenous excretory product. Earthworm excretes 40% urea, 20% ammonia and 40% amino acids. Frog excretes urea as the chief nitrogenous product.

55 **(a)**

JG cells to release renin.

The kidneys have built in mechanisms for the regulation of glomerular filtration rate. One such efficient mechanism is carried out by juxta glomerular apparatus (JGA), JGA is the special sensitive region formed by cellular modification in the distal convoluted tubule and the afferent arteriole at the location of their contact. A fall in GFR can activate the JG cells to release renin, which can stimulate the glomerular blood flow and there by GFR back to normal

56 **(b)**

Increased concentration of ketone bodies in urine is called **ketonuria**.

57 **(a)**

Antennal glands or green glands.

A survey of animal kingdom presented a variety of excretory structures

(i) **Invertebrate** have simple tubular type of excretory organs

(ii) **Vertebrate** have complex tubular form called the kidney

	(iii) Platyhelminthes (Flatworm planaria) Protonephridia of flame cells are excretory organs		Vasa recta is absent or highly reduced in cortical nephrons.
	(iv) Some Annelids and Cephalochordate Protonephridia concerned primarily		Bowman's capsule encloses the glomerulus.
	osmoregulations (v) Earthworm and Annelids Nephridia is the excretory organ (vi) Insect Malpighian tubules are the excretory organs. Antennal glands or green glands performs		The Malpighian corpuscles, proximal convoluted tubule (PCT) and distal convoluted tubule (DCT) are situated in the cortical region of the kidney, whereas the Henel's loop in the medulla.
58	 the excretory functions in crustaceans like prawn (c) The plasma fluid that filters out from glomerular capillaries into Bowman's capsule of nephron is called glomerular filtrate. A comparison of the 	64	(c) The urine formation includes glomerular filtration. Selective reabsorption and tubular secretion. The glucose is reabsorbed at proximal convoluted tubules.
	volume of the filtrate formed per day (180 L/day) with that of the urine released (1.5 L), suggest that nearly 99% of the filtrate has to be reabsorbed by the renal tubules. This process is called reabsorption.	65	(c) Reabsorption is the selective transport of substances across the epithelium of excretory tubule from the filtrate to the interstitial fluid. The proximal convoluted tubule (PCT) region of a
59	(a) Proximal convoluted tubule of nephron is pivotal site for reabsorption of glucose, amino acids, Na ⁺ K ⁺ by active transport. Here, 80% of water is		nephron does maximum reabsorption of useful substances such as glucose, amino acids, vitamin- C, Na ⁺ , K ⁺ , Ca ²⁺ , etc.
	reabsorbed by passive transport.	66	(c) Kreh-Henseleit cycle
60	(c) Large quantity of water is reabsorbed in PCT and loop of Henle. About 80% of water is reabsorbed in PCT and loop of Henle. This is called obligatory	67	(b) Nearly all of the essential nutrients and 70-80 per cent of electrolytes and water are reabsorbed by this segment. PCT also helps to maintain the pH
61	water reabsorption (a) Ammonia is produced by amino acid metabolism		and ionic balance of the body fluids by selective secretion of hydrogen ion and potassium ions into the filtrate and by absorption of HCO^- from it
	Ammonia combine with CO_2 in liver to form urea by urea cycle	68	(a) Vasopressin
	H R-C-COOH NH ₂ General structure of amino acid	69	(c) Gout happens when there is high level of uric acid in blood
62	(c) Active and passive both are the ways to transport electrolyte through loop of Henle	70	(a) Osmotic pressure is a measure of tendency to take in water by osmosis. During urine formation,
63	(d) The ascending limb of Henle's loop (the next part of renal tubule) continue as another highly coiled tubular region called Distal Convoluted Tubule (DCT).		approximately two-thirds of the NaCl ⁻ and water filtered into Bowman's capsule is immediately reabsorbed across the walls of proximal convoluted tubule. This reabsorption is driven by active transport of Na ⁺ out of the filtrate and into surrounding peritubular capillaries. Cl ⁻ follows
	The juxta medullarly nephrons have long Henle's loop.		Na ⁺ passively because of electric attraction and water follows them both because of osmosis.
		71	(a)

(i) **Ammonia** (NH_3) It is the first metabolic waste of the protein metabolism. Ammonia is produced in the liver by the process of deamination.

Ammonia is very toxic and requires large amount of water for its excretion

(ii) **Urea** White crystalline solid product produced in the liver from CO_2 and NH_3 . It is comparatively less toxic. Normal level of urea is 18-38 mg/100 mL of the blood

(iii) **Uric Acid** It is least toxic and insoluble in water. It is produced in the liver by purine catabolism in birds, and reptiles. It can be excreted in solid or semisolid form. Excretion of uric acid in solid or semisolid form conserve water. Uric acid is commercially extracted from the bird dropping (guano)

72 **(d)**

The plasma fluid that filters out from glomerular capillaries into Bowman's capsule of nephrons is called glomerular filtrate. It is a non-colloidal part and possesses urea, water, glucose, amino acids, vitamins, fatty acid, uric acid, creatinine salts, etc. RBCs, WBCs platelets and plasma proteins are the colloidal parts of the blood and do not filtrated out from glomerulus. Thus, plasma proteins are higher in concentration in blood than in glomerular filtrate.

73 **(a)**

Normal urine is slightly acidic. Variations in urine pH are closely related to diet. A high protein diet increases acidity, a diet composed largely of vegetables increases alkalinity.

74 **(c)**

Intestinal Uricolysis converts uric acid into urea and ammonia.

75 **(b)**

Mammals have the ability to produce a concentrated urine. Henle's loop and vasa recta plays a significant role in producing concentrated urine

76 **(b)**

Excretion is the removal of metabolic wastes from the body. CO_2 and water are the metabolic waste for carbohydrates and fat metabolism. Their removal is, therefore called excretion **Osmoregulation** is the control over the concentration of the water and salt in the body

77 **(b)**

Ornithine is not found in proteins. It is formed by hydrolyzing arginine and important in the formation of urea.

78 **(a)**

Renal pelvis.

Towards the centre of the inner concave surface of the kidney, there is a notch called hilum through which ureter, blood vessels and nerves enter. Inner to the hilum is a broad funnel-shaped space called the renal pelvis with the projections called calyces

79 **(c)**

ADH released from the posterior pituitary plays an important role in regulating the amount of urine passed out by affecting the permeability of the DCT. Water absorption in DCT mediated by ADH is called facultative water reabsorption.

81 **(d)**

A – afferent atriole B – efferent atriole

82 **(d)**

Both (a) and (b).

Juxta-glomerular apparatus (JGA) operates a multihormonal Renin-angiotensin-Aldosterone System (RAAS. JGA release an enzyme renin in the blood, which initiates chemical reactions that produces angiotensin-II, a potential stimulator of aldosterone (mineralocorticoids) release by the glomerulosa cell. It increases blood pressure, blood volume and completes the feedback circuit by supporting the release of renin

83 **(b)**

Nephritis The infection is caused by bacteria (streptococci) which results in inflammation of kidney that involve glomerulus

84 **(c)**

Ammonia is converted into urea through urea cycle or Krebs-Henseleit cycle in liver.

85 **(a)**

Solenocytes are excretory structures similar to flame cells but supplied with blood vessels for picking up excretory products present in some invertebrates and lower chordates.

86 **(b)**

Tadpole of frog, excretes ammonia as a waste product, called ammonotelic and this phenomenon is called ammonotelism, whereas adult frog, excretes urea as a waste product, called ureotelic and the phenomenon is called ureotelism.

87 **(d)**

Accessory excretory organs are the organs, which have their own specific functions but carry out excretion as a secondary activity, *e.g.*, lung, skin, liver

88 **(d)**

The Juxtaglomerular cells of kidney produce a peptide hormone called erythropoietin which stimulates erythropoiesis (formation of RBCs).

89 **(a)**

- A JG cells
- B Renin
- C angiotensin-I
- D angiotensin-II

90 **(c)**

From the distal convoluted tubule, the filtrate enters the collecting tubule, where further reabsorption of water takes place. Now the filtration become more concentrated which place. Now the filtration become more concentrated which makes the filtrate hypertonic. When the collecting duct become less permeable to water it produces more dilute urine.

91 **(c)**

The excretory material of bony fishes like *Hippocampus* is ammonia. So, bony fishes are ammonotelic.

92 **(b)**

Urine consists of water and organic and inorganic substances. It is hypertonic to blood. The medullarly part of kidney possesses loop of Henle, which has fluid that is hypertonic to blood plasma but isotonic to urine.

93 **(d)**

ADH, Renin angiotensin, ANF, countercurrent mechanism all of them plays a significant role in osmoregulation of body fluids

94 **(b)**

When blood from cortex goes through the descending loop, it loses water and gain salts and salutes. As blood ascends, the reverse occurs and it gains water and gradually loses salts and solutes

95 **(c)**

Filtration takes place through tiny spaces amongst the cells of capillary walls and filtration slits of podocytes in Bowman's capsule. Ultrafiltrate is plasma minus protein. Loop of Henle concentrate the urine counter current mechanism

96 **(b)**

The correct process of urine formation in the given figure are-A-Pressure filtration B-Reabsorption C-Secretion D-Collection of urine

97 **(b)**

Ornithine cycle or urea cycle or Krebs-Henseleit cycle was discovered by Hans Krebs and Kurt Henseleit. It takes place in liver cells. The main component of ornithine cycle are arginine, ornithine and citrulline.

98 **(b)**

99

Collecting duct

(i) This is the long ducts extends from cortex of the kidney to the inner parts of medulla(ii) Large amount of water reabsorbed from this

(ii) Large amount of water reabsorbed from this region

(iii) Concentrated urine production takes place(d)

During urine formation, salts and other wasters are dissolved in the filtrate and pass with it out of the kidney as urine. But sometimes, certain salts (such as calcium oxalate) do not dissolved and form crystals called **calcium stones**. These can partially block the flow of the urine from the kidney.

100 **(a)**

Anuria Happens when failure of kidney to form urine

101 **(c)**

Proximal Convoluted Tubule (PCT)

Descending Lop of Henle (DLH)

* Ascending Loop of Henle (ALH)

↓ Distal convoluted Tubule (DCT)

Collecting Duct (CD)

102 **(b)**

	Green glands are excretory organs in Arthropoda.	109	(b)
	The renal columns of Bertini is the part of cortex		Presence of interstitial gradient helps in an easy
	continued inside medulla between pyramids.		passage of water from the collecting tubule there
			by concentrating the filtrate (urine). Human
104	(a)		kidney can produce nearly four times
	Steps for Urination Bladder fills with urine and		concentrated than the initial filtrate formed
	becomes distended. Stretch receptors on the wall	110	(c)
	of urinary bladder send signal to the CNS.		ANF (Atrial Natriuretic Factor) mechanism
	CNS posses on motor message to initial		
	messengers to initiate the contraction smooth		Activate
	muscle of bladder and simultaneous relaxation of		Heart to secrete
	urethral sphincter causing the release of urine		A NE causes
105	(a)		
	Insects.		Vasodilation (dilation of blood vessels)
	A survey of animal kingdom presented a variety of		↓ This cause Decrease in blood pressure
	excretory structures		↓
	(i) Invertebrate have simple tubular type of		Hence the glomerulus filtration decrease
	excretory organs		ANF – mechanism therefore, acts as a check on
	(ii) Vertebrate have complex tubular form called		renin-angiotensin mechanism
	the kidney	111	(a)
	(iii) Platyhelminthes (Flatworm planaria)		In mammals, main excretory product is urea (20-
	Protonephridia of flame cells are excretory organs		30 gm).
	(iv) Some Annelids and Cephalochordate	112	(a)
	Protonephridia concerned primarily	112	Medullary gradient is mainly developed by NaCl
	osmoregulations		and urea and this is developed by counter current
	(v) Earthworm and Annelids Nephridia is the		mechanism of vasa recta and Henle loop
	excretory organ	113	(h)
	(vi) Insect Malpighian tubules are the excretory		An adult human excretes, on an average, I-5.5 of
	organs. Antennal glands or green glands performs		urine per day. Volume of urine depends upon
100	the excretory functions in crustaceans like prawn		intake of fluids, external temperature and
106	(b)		physical activities
	A – glomerulus	114	(a)
	B – filtration		A-adrenal cortex. B-aldosterone
	L = 1100 = 1200	115	(d)
	$D - \frac{1}{5}$ th		Sequence of urine route
107	(d)		Calvx \rightarrow Renal pelvis \rightarrow Ureter \rightarrow Urinary bladder
	Vasa recta is present in cortical nephron at the		→ Urethra
	juxta medullary region for conserving the water	116	(a)
	(counter current mechanism).		Kidneys are excretory organs of vertebrates. They
	During summers, when body loses lot of water by		are consisted of numerous units called nephrons .
	evaporation, the release of ADH is increased due		Each nephron contains a U-shaped tube, which
	to decrease of water loss		has an ascending and a descending limb. This U-
108	(c)		shaped tube is known as loop of Henle . Thus, it is
	Cortex region of kidney is outer region. The		associated with excretory system. The loop of
	proximal end of each nephron forms a blind or		Henle works on the basis of counter current
	closed enlarged and double walled cup, the		multiple system and thus, helps in regulating
	Bowman's capsule in the cortex. Thus, all the		concentration of urine.
	Bowman's capsules of the kidney are found in the		

cortex.

117 (a)

Ammonia (NH_4^+) affect the brain cell by changing the polarity of cell membrane of brain. Change in polarity affects transport across the cell membrane

118 (d)

The gradient of medullary region is primarily by NaCl and urea. NaCl is transported by ascending limb of Henle' loop which is exchanged with descending limb of vasa recta. Similarly small amount of urea enter the thin segment of the ascending limb of Henle's loop which is transported back to interstitium by collecting tubule. The above described transport of substances facilitated by special arrangement of Henle's loop and vasa recta is called counter current mechanism

119 **(b)**

ADH or vasopressin is a hormone secreted from posterior pituitary. It controls the reabsorption of molecules in the tubules of the kidney by affecting the tissues permeability.

120 (d)

(i) Fertilisation is external in frog and internal in humans

(ii) Human's RBC is non-nucleated

(iii) Frog has three chambered heart, humans have four-chambered heart

(iv) Frog and human both are ureotelic(v) Lungs are organs of respiration in human, while in frog cutaneous and lung respiration is there

121 **(b)**

Meristic variation is a type of variation involving the number of arrangement of parts of an organism.

In meristic trait, the phenotype is determined by counting.

122 **(b)**

Haemodialysis is the process, in which an artificial kidney is used for removing accumulated excretory substances like urea, uric acid, creatinine and other waste products from the blood. It is generally used in case, of uremia (in which concentration of urea is increased) in urine patients when kidneys are not functioning properly. The kidneys have built in mechanisms for the regulation of glomerular filtration rate. One such efficient mechanism is carried out by juxta glomerular apparatus (JGA). JGA is the special sensitive region formed by cellular modification in the distal convoluted tubule and the afferent arteriole at the location of their contact. A fall in GFR can activate the JG cells to release renin, which can stimulate the glomerular blood flow and there by GFR back to normal

124 **(d)**

Kidney transplantation is the ultimate method in the correction of acute renal failure. A functioning kidney is used is transplantation from a donor, preferably a close relative, to minimise its chances of rejection by immune system of the host. Modern clinical procedures have increased the success rate of such complicated technique. Cyclosporin-A is used as immunosuppressive agent in the kidney transplant patient

125 **(d)**

Glycosuria is the condition, when glucose is excreted in the urine because the blood sugar level exceeds from the normal.

126 **(b)**

Henle's loop concentrate the urine. It is highly develop in the organism, which are found in xerophytic condition in order to conserve water. But organism, which produces the dilute urine have little or no Henle's loop like fishes

127 **(b)**

Osmoconformers are those organisms whose body is osmotic, *i. e.*, osmotic concentration of internal environment and surrounding sea water are approximately equal. There is no net tendency for water to move in or out of body in osmoconformers. Among vertebrates hagfishes are osmoconformers.

128 **(b)**

Duct of Bellini is one of the main urinary ducts of the mammalian kidney, acting as a common collecting duct receiving branches from a number of Malpighian bodies.

All duct of Bellini then, open at the tip of the papilla or papillae into the pelvis.

129 **(b)**

123 (c)

Ornithine cycle or urea cycle takes place in the liver cells by which urea is produced from the deaminated excess amino acids.

130 **(b)**

It has been found that in rabbit, all the glucose, amino acids and some urea are absorbed in the proximal convoluted tubule.

131 **(c)**

Water reabsorption in DCT and CT by ADH is called the facultative water reabsorption. Vasopressin (ADH) hormone from posterior pituitary plays an important role in regulating the amount of urine passed out by effecting the permeability of DCT

132 **(c)**

- A ureter
- B Inferior vana cava
- C Dorsal aorta
- D Urethra
- E Medulla



133 **(c)**

Spiders excrete guanine and therefore, these are called guanotelic. Guanine is a metabolic waste product of nucleotide metabolism.

134 **(b)**

Medullary interstitial fluid

135 **(c)**

Release Urine.

Micturition is a reflex of voiding urine. If the urine content of urinary bladder reaches more than 300 mL micturition reflex starts. Neural mechanism of micturition is called micturition reflex

136 **(d)**

A – CNS, B – motor message, C – relaxation. **Steps for Urination** Bladder fills with urine and becomes distended. Stretch receptors on the wall of urinary bladder send signal to the CNS. CNS posses on motor message to initial messengers to initiate the contraction smooth muscle of bladder and simultaneous relaxation of urethral sphincter causing the release of urine

137 **(d)**

Kidneys are the main excretory organ in humans. Kidneys are reddish-brown, bean-shaped structure situated between the levels of the last thoracic and third lumber vertebrae closer to the dorsal inner wall of the abdominal cavity. Each kidney is 10-12 cm long, 5-7 cm width, 2-3 cm in thickness. The average weight of the kidney is 120 to 170 gm

138 **(d)**

Loop of Henle is found in renal medulla of kidney. It consists of a descending limb and an ascending limb. The upper part of descending limb is the thick segment while distal part of descending limb is the thin segment.

139 **(a)**

The excretory system of crustacean (*Palaemon*) consists of a pair of antennary or green glands, a pair of lateral ducts and an unpaired renal or nephroperitoneal sac. Coxa of each antenna encloses an antennary gland.

140 **(b)**

Pronephric kidney is the most primitive type of kidney. It opens into body cavity and the functional unit is ciliated funnel or nephrostomes, *e*. *g*., tadpole of frog.

141 **(b)**

Urine specific gravity is a test that measures the concentration of particles in the urine. Specific gravity of urine is normally 1.015-1.020.

142 **(c)**

Haemodialysis During dialysis, the blood drained from a convenient artery is pumped into a dialysing unit after adding anticoagulant like heparin. The unit contains a coiled cell phone tube surrounded by a fluid (dialysing fluid) having the same composition as that of plasma except the nitrogenous wastes.

The porous cell phone membrane of the tube allows the passage of molecules based on concentration gradient. As nitrogenous wastes are absent in dialysing fluid these substances freely move out, there by clearing the blood. The cleared blood is pumped back to the body through a vein after adding antiheparin to it. This method is a boon for thousands of uremia patient all over the world

143 **(c)**

The process of pressure filtration through glomerular capillaries in Bowman's capsule is known as glomerular filtration and the filtrate is called renal fluid. Renal fluid is isotonic to cortical fluid and blood in PCT and DCT.

144 **(b)**

Presence of excess urea in urine is uremia.

145 **(d)**

DCT reabsorbs \rightarrow Na⁺, K⁺, HCO₃, NH₃ and water. Nitrogenous water are absorbed by passive transport. Reabsorption of water also occurs passively in the initial segment of nephron

147 **(d)**



Longitudinal section (digrammatic) of kidney

The outer layer of the kidney is a tough capsule. Inside the kidney, there are two zones-cortex and medulla. Medulla is divided into few conical masses called medullary pyramids. The cortex extends in between the medullary pyramids as renal columns called columns of Bertini

148 **(d)**

The flow of filtrate in the two limbs of Henle's loop is in opposite directions and thus forms a counter current mechanism (The process due to which the urine is made hypertonic). Vasa-recta also plays a significant role in counter-current mechanism

149 **(c)**

Aldosterone causes the reabsorption of water and Na⁺ from distal part of duct

150 **(c)**

Alkaptonuria is the genetic disease in which homogenestic acid is excreted out with urine

151 **(d)**

Sweat produced by sweat gland is a watery fluid containing NaCl, small amounts of urea, lactic acid, etc. Though the primary function of sweat is to facilitate a cooling effect on the body surface

152 **(c)**

GFR The amount of the filtrate formed by the kidneys per minute is called glomerular filtration rate. GFR in healthy individual is 125 mL/minute, *i.e.*, 180 litres per day

153 **(c)**

A-urea, B-liver, C-kidney

154 **(d)**

A comparison of the volume of the filtrate formed per day (180 litre per day) with that of the urine released (1.5 litres), suggests that nearly 99% of this filtrate has to be reabsorbed by the renal tubules. This process is called reabsorption

155 **(a)**

Camel is called as 'Ship of Desert' due to its adaptations for xerophytic environment. Camel excretes a highly concentrated urine to conserve water and can also tolerate desiccation up to 40% cellular content.

156 **(c)**

Tubular secretion takes place in DCT and collecting tubules. It is the active secretion or excretion of waste products from blood capillaries and interstitial fluid into the lumen of nephron.

157 **(d)**

pH of urine ranges from the 5.0 to 7.8. Average pH = 6.0 (slightly acidic)

158 **(b)**

If one litre of water is introduced in human blood then RBCs absorbs it (as water is hypotonic to their internal environment) swell up and burst. Besides of this, there is also increases in the urine production as more water is passed in the nephric filtrate.

159 **(d)**

A – reabsorbed, B – Concentrated, C – Urea

160 **(b)**

Glucose, amino acid, Na⁺ are absorbed actively in the nephron

161 **(c)**

Vasopressin

162 **(d)**

During urine formation, the tubular cells secretes substances like H⁺, K⁺ and ammonia into the filtrate. Tubular secretion is also an important step in urine formation as it helps in the maintenance of the ionic and acid base balance of the body fluids

163 **(a)**

The expulsion of urine from the urinary bladder is called **micturition**. It is a reflux process but in grown up children and adults, it can be controlled voluntarily to some extent.

164 **(c)**

When the kidneys completely damaged and do not function, the patient often receives **haemodialysis** (treatment with an artificial kidney). Haemodialysis is the separation of certain substances (*e. g.*, urea, uric acid, creatinine, etc) from blood by use of a selective permeable membrane.

=Blood-(blood cells + plasma

165 (a)

Glomerular filtrate=Plasma-Proteins

. . .

proteins)

166 **(c)**

Renin angiotensin mechanism. ANF (Atrial Natriuretic Factor) mechanism

> ↓ Increase in blood flow to atria of heart ↓ Activate Heart to secrete

ANF causes Vasodilation (dilation of blood vessels) Unis cause Decrease in blood pressure

Hence the glomerulus filtration decrease

ANF – mechanism therefore, acts as a check on renin-angiotensin mechanism

167 **(b)**

A – Urinary bladder, B – CNS, C – Stretching

168 **(c)**

Renal portal system is well developed in fishes and amphibians, reduced in reptiles and birds and is absent in mammals.

169 **(d)**

Fall in Glomerular Blood Flow (GbF)/Glomerular Blood Pressure (GBP)/ and low Glomerular Filtration Rate (GFR) can activate the juxtaglomerulus cells in kidney

170 **(c)**

Juxta medullary nephrons are found in camel, kangaroo and rat.

On the basis of the length of loop of Henle, the nephron is of two types

Juxtamedullary Nephron Cortical Nephron \Rightarrow Found in the majority of \Rightarrow Found in comparatively animals except which is less animals, which have the special adaptability having special adaptation to conserve water to xerophytic conditions \Rightarrow The loop of Henle is long. \Rightarrow The loop of Henle is *e.g.*, camel, kangaroo rat. very short. e.g., fishes, rabbit, etc. \rightarrow Vasa recta is prominant \Rightarrow Vasa-recta is absent or highly reduced. 171 (c) Renalcaluli stones or insoluble mass of crystallised salts (oxalates, etc.) formed with in the kidneys 172 **(b)** Our lungs removes large amounts of CO_2 (18) L/day) and also significant quantities of water every day 173 (c) I, III and IV. Glomerular capillary blood pressure causes the filtration of the blood through three layers, *i.e.*, (i) The endothelium of the glomerular blood vessels (ii) Epithelium of Bowman's capsule (iii) Basement membrane between these two lavers The epithelium of the Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called podocytes 174 **(b)** Ornithine cycle or Kerbs Henseleit cycle takes place in liver cells. It continuously removes dangerously toxic ammonia and some CO₂ from blood and releases less toxic urea into the blood. Kidney continuously remove urea from blood to excrete it in urine. 175 (d) All of these. Osmoreceptors in the body are activated by changes in the blood volume, body fluid volume and ionic concentration. An excessive loss of fluid

from the body can activate these receptors, which

stimulate the hypothalamus to release ADH

(Antidiuretic Hormone) or vasopressin from

neurohypophysis (posterior lobe of pituitary).

ADH facilitate the water reabsorption from latter

parts of the tubule there by preventing decreases

176 (c)

or water loss

Distal Convoluted Tubule (DCT) Conditional reabsorption of Na⁺ and water takes place in this segment. DCT is also capable of reabsorption of HCO_3^- and selective secretion of hydrogen and potassium ions and NH₃ to maintain the pH and sodium-potassium balance in blood

177 (a)

On an average, 25-30 gm of urea is extracted per day. Various conditions can affect the characteristics of urine like type of food, weather condition, etc.

178 **(b)**

Malfunctioning of kidneys can lead of the accumulation of urea in blood, this condition is called uremia which is very harmful and may lead to kidney failure. In such patient urea can be removed by process called haemodialysis

179 **(a)**

Podocyte cells are present on membrane of Bowman capsule glomerular filtrate is concentrated in descending loop of Henle because it is permeable for water and is ascending limb it is diluted because Na, K⁺, Cl⁻ are juxta-glomerular apparatus is present in distal convoluted tubule

180 **(d)**

Urine formation involves three stages (i) Ultrafiltration (*step*-I)

(ii) Reabsorption (*step*-II)

(iii) Tubular secretion (*step*-III)

181 **(b)**

Vasa Recta are 'U'-shaped blood vessels running parallel to the loop of Henle, forming a counter current system in the juxtamedullary nephron. These are the continuation of efferent arterioles. The slow blood flow of vasa recta and are responsible for maintaining the hyperosmolarity

182 **(a)**

Urea is generally excreted outside the body through Nephridia or kidney. Animals, which produce urea are known as ureotelic and excretion as ureotelism, *e. g.*, mammals, adults amphibian, etc.

183 **(a)**

Juxtaglomerular apparatus (JGA) operates a multihormonal Renin-Angiotensin-Aldosterone System RAAS. JGA releases an enzyme renin in the blood, which initiates chemical reactions that produces **angiotensin-II**, a potential stimulator of aldosterone (mineralocorticoids) release by the glomerulosa cell. It increases blood pressure, blood volume and completes the feedback circuit by supporting the release of renin.

184 **(c)**

A flame cell is a specialised excretory cell found in the simplest freshwater invertebrates, including, flatworms, rotifers and nemerteans. These are the simplest animals to have a dedicated excretory system. Flame cells function like a kidney, removing waste material bundles of flame cells are called protonephridia

185 **(b)**

Pelvis is the main, basin-shaped cavity of the kidney into which urine is discharged by nephrons. The term 'pelvis' is also used for the basin-shaped structure formed by the hipbones together with the sacrum and coccyx (or caudal vertebrae).

186 **(b)**

Jaundice is characterized by the presence of abnormal amount of bilirubin in blood and urine.

187 **(d)**

A – Increasing, B – 300, C – 1200

188 **(a)**

PCT helps to maintain the pH and ionic balance of the body fluid by selective secretion of hydrogen ion, ammonia and potassium ion into filtrate and by absorption of HCO_3^- from it.

DCT capable of reabsorption of HCO_3^- and selective secretion of hydrogen and potassium and NH_3 to maintain the pH and sodium-potassium balance in blood

189 **(a)**

On taking large amount of proteins, a great amount of urea is excreted out.

190 **(c)**

Metabolism of food materials products some waste materials, and removal of these waste materials from the body is called **excretion**.

191 **(d)**

Renin-angiotensin mechanism

Fall in glomerular blood flow glomerular blood				
pressure/glomerular filtrations rate				
Activate the				
juxtagseslomerular				
cells (JG - cells)				
↓ To Release				
Renin which convert				
Ļ				
Angiotensinogen (in blood)				
to				
Angiotensin-I				
Proteolytic enzyme				
Angiotensin-II				
Activate the adrenal				
cortex to release				
Aldosterone				

(Causes reabsorption of Na⁺ and water from distal parts of tubule this also leads to an increase in blood pressure in GFR. This complex mechanism is generally known as renin-angiotensin mechanism.)

192 **(b)**

The main function of the Henle's loop is to absorb water from the tubular lumen thus, making the urine concentrated. If they have been absent, the urine would have been more dilute.

193 (a)

PCT (Proximal Convoluted Tubule) PCT is lined by simple cuboidal brush border epithelium, which increases the surface area for reabsorption. Which secreted H^+ , K^+ and ammonia into the filtrate and absorption of HCO_3^- from it

194 **(b)**

Uric acid, a normal waste product of nucleic acid metabolism, is ordinary excreted in urine without any problems. However, when blood levels of uric acid rise excessively (due to its excessive production or slow excretion), it may be deposited as needle-shaped urate crystals in the soft tissues of joints. An inflammatory response follows, leading into an agonizingly painful attack of **gouty arthritis** (gowte) or gout.

195 **(c)**

Juxtaglomerular cells of the kidney secrete an enzyme renin, which converts angiotensinogen in liver into angiotensin-I, which is then converted into angiotensin-II. Thus, this renin-angiotensin pathway stimulates the adrenal cortex to produce aldosterone, which maintains Na⁺and water concentration and controls the blood pressure.

196 (a)

About 80% of the nephrons have, loop of Henle, which is too short, therefore it is present in the cortical region of the kidney, 20% nephron have long loop of Henle, which dips into the medulla of the kidney

197 **(b)**

ADH hormone prevent the loss of water from our body by increasing the permeability of DCT.

Hence, it regulate the osmoregulation of our body

198 **(b)**

- A = osmoreceptors
- B = suppress
- C = Feed back

199 **(c)**

Nitrogen compound is produced by various metabolic process, known as Deamination. A small fraction of nitrogen is used to produce new compounds, while the remaining part is washed away as waste products. First formed vertebrate was fish, which excrete out ammonia. Ammonia is a water soluble compound so, it can diffuse out from the body easily.

200 (a)

Kidney regulate the concentration and volume of blood by maintaining chemical balance and removing excess fluids in the form of urine. Urine formation takes place in kidney. It includes glomerulus filtration, selective reabsorption and tubular secretion. Maximum concentrated urine is present in CT. Urine is concentrated in kidney

201 **(b)**

Malfunctioning of kidney can lead to accumulation of urea in blood a condition called uremia, which is highly harmful and may lead to kidney failure. In such patients, urea can be removed by a process called haemodialysis.

202 **(a)**

The excretion of nitrogen in the form of uric acid (excretory product) is called Uricotelism and the concerned animals are called Uricotelic, *e. g.*, insects, birds and reptiles. Uric acid is the end product of purine metabolism and is excreted in semi-solid form.

203 **(b)**

Uric acid is the excretory product of purine catabolism in primates, birds and some other animals, but in many other vertebrates, it is further degraded to allantoin by the action of urate oxidase. Human urine consists of 95% water, mainly nitrogenous organic compounds including urea, uric acid, creatinine and hippuric acid.

204 **(b)**

Uric acid.

(i) **Ammonia** (NH_3) It is the first metabolic waste of the protein metabolism. Ammonia is produced in the liver by the process of deamination.

Ammonia is very toxic and requires large amount of water for its excretion

(ii) **Urea** White crystalline solid product produced in the liver from CO_2 and NH_3 . It is comparatively less toxic. Normal level of urea is 18-38 mg/100 mL of the blood

(iii) **Uric Acid** It is least toxic and insoluble in water. It is produced in the liver by purine catabolism in birds, and reptiles. It can be excreted in solid or semisolid form. Excretion of uric acid in solid or semisolid form conserve water. Uric acid is commercially extracted from the bird dropping (guano)

205 **(c)**

Osmoreceptors in the body are activated by changes in the blood volume, body fluid volume and ionic concentration. An excessive loss of fluid from the body can activate these receptors, which stimulate the hypothalamus to release ADH (Antidiuretic Hormone) or vasopressin from neurohypophysis (posterior lobe of pituitary). ADH facilitate the water reabsorption from latter parts of the tubule there by preventing decreases or water loss

206 **(c)**

- A vaso constrictor
- B GFR
- C aldosterone

207 (a)

Kidney regulate the concentration and volume of blood by maintaining chemical balance and removing excess fluids in the form of urine. Urine formation takes place in kidney. It includes glomerular filtration, selective reabsorption and tubular secretion.

208 **(a)**

Convoluted tubule is the highly convoluted segment of nephron in the renal labyrinth of the kidney. It is made up of the proximal tubule leading from the Bowman's capsule to the descending limb of Henle's loop and the distal tubule leading from the ascending limb of Henle's loop to a collecting tubule.

209 **(b)**

Primary function of skin is cooling. Sweat produced by sweat gland is a watery fluid containing NaCl, small amounts of urea, lactic acid, etc. Though the primary function of sweat is to facilitate a cooling effect on the body surface

210 (d)

Our liver secretes bilirubin, biliverdin, cholesterol, degraged steroid hormone, vitamin and drugs

211 **(c)**

Functions ADH

- (i) Reabsorption of water from DCT and CT
- (ii) Constriction of blood vessel
- (iii) Increase the blood flow

212 **(b)**

ADH (Antidiuretic hormone) or vasopressin produced in the hypothalamus of the brain and released into the blood steam from the pituitary gland, enhances fluid retention by making the kidneys to reabsorb more water. Hyposecretion of vasopressin leads no water absorption in the collecting ducts, which results in secretion of dilute urine.

213 **(d)**

The average size of filtration slit or slit pore of glomerulus is 25-60 nm.

214 (d)

Analysis of urine helps in clinical diagnosis of many metabolic disorders as well as malfunctioning of the kidney. For example, presence of glucose (glycosuria) and ketone bodies (ketonuria) in urine are indicative of diabeties mellitus

215 **(b)**

Uriniferous tubules are the vital morphological and physiological units of mammalian kidney.

216 **(b)**

On taking large amount of proteins, large amount of ammonia is formed and as a result large amount of urea is formed in liver by combining ammonia and CO_2

217 **(d)**

Correct statements regarding the dialysis (i) Blood taken out from the artery and pumped back to vein in dialysis (ii) Heparin is used before heamodialysis(iii) Nitrogenous waste are removed by passive transport

218 **(b)**

Animal	Excretory Product	Example
Uricotelic	Uric acid	Reptiles
Ammonot -elic	Urea	Sponges
Ureotelic	Ammonia	Mammals like rabbit
Aminoteli-	Amino -	In some
С	acids	animal,
		amino
		acids are
		excreted
		in small
		amount

219 **(d)**

1932 220 **(a)**

Glomerular area of adrenal cortex is responsible for water and electrolyte balance. Zona glomerulosa layer of adrenal cortex secretes hormones that influences the kidneys to excrete or retain sodium and potassium, depending on the needs of the body. These hormones and mineralocorticoids.

221 **(c)**

Glomerular capillary blood pressure causes the filtration of the blood through three layers, *i.e.*, (i) The endothelium of the glomerular blood vessels

(ii) Epithelium of Bowman's capsule

(iii) Basement membrane between these two layers

The epithelium of the Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called podocytes

222 **(b)**

Podocytes or foot cells are specialized cells of peculiar shape present in the epithelium visceral inner layer of Bowman's capsule, surrounding the glomerulus. They posses foot like processes or projections, the pedicers. Hence, called as foot cells.

223 **(d)**

Urea, uric acid and ammonia all are nitrogenous wastes. Ammonia is highly toxic and soluble in water, therefore, requires a large amount of water for excretion. Urea is less toxic and less soluble in water than ammonia. Uric acid crystals are nontoxic and almost insoluble in water.

224 **(d)**

Reptiles, birds, land snails and insects excrete nitrogenous waste as uric acid in the form of pellet of paste with a minimum loss of water and are called Uricotelic animals.

225 **(a)**

Main function of glomerulus is filtration of urine.

226 **(b)**

The expulsion of urine from the urinary bladder is called **micturition**.

227 **(d)**

The animals that excrete nitrogen in the form of urea are called ureotelic. Ureotelic animals include man, other mammals and aquatic mammals like whales. So, whale is ureotelic and not ammonotelic.

228 **(c)**

Posterior lobe of pituitary (neuro hypophysis)

229 **(c)**

Loop of Henle, also called nephron loop, is a Ushaped tube that extends from the proximal tubule. It plays a role in the transport of ions and water and the concentration of urine.

230 **(a)**

A – Afferent arteriole Curries the blood to glomerulus

B – **Efferent arteriole** carries the blood away from glomerulus toward renal vein

C – **Henle's loop** least reabsorption take place here and concentrate the urine

D – **DCT** Secretion of K⁺ ions into the surrounding medulla

231 **(d)**

In humans, the principal nitrogenous excretory compound (urea) is synthesised in liver by ornithine cycle. Urea is eliminated mostly through kidney as excretory product

232 **(b)**

Each nephron or uriniferous tubule contains a network of blood capillaries, the glomerulus, connected with afferent arteriole on one side and an efferent arteiole on the other side.

233 (b)

Haemodialysis.

Malfunctioning of kidneys can lead of the accumulation of urea in blood, this condition is called uremia which is very harmful and may lead 242 (d) to kidney failure. In such patient urea can be removed by process called haemodialysis

234 (c)

Blood enters in glomerulus through afferent arterioles and exits out through efferent arterioles.

235 (b)

Composition of urine Water - 95% Urea - 2.6% Uric acid – 0.3% (derived from nucleic acid metabolism)

Salts (NaCl) - 1.5%

236 (d)

All of these.

Steps for Urination Bladder fills with urine and becomes distended. Stretch receptors on the wall of urinary bladder send signal to the CNS. CNS posses on motor message to initial messengers to initiate the contraction smooth muscle of bladder and simultaneous relaxation of urethral sphincter causing the release of urine

237 (a)

GFR of a healthy person is 125 mL/min or 180 L per day

238 (a)

In kangaroo rat, loop of Henle is significantly longer as it descends further into the medulla and produces a higher concentration gradient in the surrounding tissue. This concentration gradient allows more water to diffuse into the surrounding tissues to be reabsorbed.

239 **(b)**

Digestive wastes.

Liver, the largest gland in our body secretes bile containing substances like bilirubin, biliverdin, cholesterol, degraded steroid hormones, vitamins and drugs. Most of these substances ultimately pass out along with digestive wastes

240 (a)

Uric acid is commercially extracted from the bird droppings. Bird droppings or excretion is also called guano

An increase in blood flow to the atria of heart can cause the release of ANF, which causes vasodialator of blood vessels and thereby decreases blood pressure

The kidneys have a special mechanism for concentrating the urine, it is called counter current mechanism. The animals which excrete hypertonic urine have longer loop of Henle.

243 **(b)**

Triazenes are derived from urea.

244 (a)

One million nephron

245 (c)

The mammals, CO₂ and ammonia are removed from blood and used up in ornithine cycle.

246 (b)

Nephridia in earthworm, Malpighian tubules in cockroach and urinary tubules in rat,all are excretory in functions.

247 **(b)**

All glucose amino acid and some urea are absorbed in the proximal convoluted tubule, 70-80% substances reabsorbed in this region

248 (b)

Henle's Loop Reabsorption in this segment is minimum. However, this region plays a significant role in the maintenance of high osmolarity of medullary interstitial fluid. The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. This concentrates the filtrate as it moves down. The ascending limb is impermeable to water but allows transport of electrolytes actively or passively. Therefore, as the concentrated filtrate pass upward, it gets diluted due to the passage of electrolytes to the medullar fluid

249 (d)

The blood pressure in glomerular capillaries become very high, so that there is continues process of ultra-filtration. Glomerular filtrate contains a large amount of water and other dissolved substances such as urea, uric acid, creatinine, amino acids, glucose, sodium, potassium, vitamins, etc.

About 120 mL, GP is produced per minute, *i.e.*, approx 170 L filtrate is produced in 24 hour.

250 (d)

Each nephron or uriniferous tubule is made up of two main parts, *i.e.*, Malpighian body and renal tubule.

Malpighian body is composed of glomerulus and Bowman's capsule. Bowman's capsule is a blind cup shaped end of uriniferous tubule.

251 (a)

Proximal convoluted tubule (PCT) is involved with complete reabsorption of glucose by active transport and reabsorption of most of the amino acids and vitamin-C, $Na^+(70\%)$, $K^+(75\%)$ and a large amount of Ca²⁺from glomerular filtrate.

252 (d)

All of above.

Nearly all of the essential nutrients and 70-80 per cent of electrolytes and water are reabsorbed by this segment. PCT also helps to maintain the pH and ionic balance of the body fluids by selective secretion of hydrogen ion and potassium ions into the filtrate and by absorption of HCO_3^- from it

253 (d)

Alkaptonuria is a genetic disease. It is a metabolic disorder, in which patient excrete large amount of homogentisic acid in urine. Such urine turns black, 261 (c) when exposed to air.

254 (d)

Due to osmotic problems, many freshwater animals cannot live for long in sea water and vice versa.

255 (a)

Medullary gradient is caused by NaCl and urea. The gradient of medullary region is primarily by NaCl and urea. NaCl is transported by ascending limb of Henle' loop which is exchanged with descending limb of vasa recta. Similarly small amount of urea enter the thin segment of the ascending limb of Henle's loop which is transported back to interstitium by collecting tubule. The above described transport of substances facilitated by special arrangement of Henle's loop and vasa recta is called counter current mechanism

Micturition is a reflex of voiding urine. If the urine content of urinary bladder reaches more than 300 mL micturition reflex starts. Neural mechanism of micturition is called micturition reflex

257 (b)

Loop of Henle has two limp Descending Thin walled, lined by squamous epithelium and permeable to water Ascending Thick walled formed by cuboidal epithelium and impermeable to water

258 (a)

Malpighian tubule are the excretory organs of insects. These open at the junction of midgut and hindgut (ileum) in cockroach. Malpighian tubules absorb excretory substances from haemolyph and fat bodies and pass into the proctodaeum. The excretory product of insects is uric acid related with water conservation in the body. These tubules are related with homeostasis, Osmoregulation and excretion.

260 (d)

Juxta-medullary nephrons have following characteristics

(i) Vasa-recta is prominant

(ii) Loop of Henle is long

(iii) Loop of Henle runs deep into the medulla (iv) Found in xerophytic animals like camel, kangaroo and rat

Tubular secretion takes place in the Proximal Convoluted Tubule (PCT) and Distal Convoluted Tubule (DCT) and also CT Ultra filtration takes place in glomerulus

262 **(b)**

Ammonia is the universal excretory of the waste product of nearly all aquatic animals, because of the following reasons :

1.It is readily soluble in water and also needs large amounts of water to dissolve.

2.It is highly toxic to internal environment of the organism and needs to be eliminated as and when it is formed.

3.It is converted to a less toxic product in aquatic animals like sharks, string rays, semi-aquatic amphibians, aquatic or semi-aquatic reptiles and aquatic mammals.

256 (a)

Solenocytes or **flame cells** are the excretory organ in phylum-Platyhelminthes.

264 (a)

On the basis of the length of loop of Henle, the nephron is of two types

↓ Cortical Nephron	↓ Juxtamedullary Nephron ↓
⇒Found in the majority of animals except which is having special adaptation to xerophytic conditions	⇒ Found in comparatively less animals, which have the special adaptability to conserve water
⇒ The loop of Henle is very short. <i>e.g.</i> , fishes, rabbit, etc.	 ⇒ The loop of Henle is long. <i>e.g.</i>, camel, kangaroo rat. ⇒ Vasa recta is prominant

 \Rightarrow Vasa-recta is absent or highly reduced.

265 (a)

Our lungs removes CO₂. Our liver secretes bile containing substances. The sweat and sebaceous gland in skin eliminate salts and other excretory product

266 (b)

The enzyme arginase cleaves arginine to form urea and ornithine. The urea is transported to kidneys for excretion. Urea is synthesized in liver through ornithine cycle, which was discovered by Hans Krebs and Kurt Henseleit (1932).

267 (a)

Nephron is the structural unit of human kidney.

269 (c)

Synthesis of urea takes place in liver through ornithine on Krebs-Henseleit cycle.

Ornithine + $NH_3 + CO_2 \rightarrow Citrulline + water$

Crnithine + $NH_3 \rightarrow Arginine + H_2O$

Arginine \rightarrow Urea + Ornithine

270 (c)

Primary excretory organs are specialised for carrying out exclusive function of excretion. e. g., kidney

271 (a)

ANF (Anti Natriuretic Factor) decrease the blood pressure vaso dilation and hence checks on reninangiotensin mechanism

272 (d)

The GFR in a normal adult person is 125 mL of plasma per minute or 180 litre of plasma per day.

273 (d)

Transitional epithelium occurs, when there is a great degree of distension or expansion in the body, e.g., urinary bladder and uterus. It appears stratified with 4 to 6 layers. This epithelium prevents rupture of urinary bladder by permitting distension. It is a type of specialized epithelia.

274 (c)

Glomerulonephritis inflammation of glomeruli of kidney

275 (a)

Glomerular filtration occurs in Bowman's capsule when the hydrostatic pressure in the glomerulus is 70 mm Hg and net filtration rate is 10 mm Hg. Effective Filtration Pressure (EEP) or Net Filtration Pressure (NEP) is Glomerular Blood Hydrostatic Pressure (GBHP) minus the Colloidal Osmotic Pressure of Blood (BCOP) and Capsular Hydrostatic Pressure (CHP)

$$EEP/NFP = GBHP - (BCOP + CHP)$$

= 60 - (32 + 18) = 10 mmHg



Urea cycle The reaction of urea cycle, which occur in the mitochondria are contained in the oval. $CPS-I \Rightarrow Carbamyl phosphate synthetase-I, OTC-is$ ornithine transcarbamoyl case

- 1. This is also called Kreb-Henselet cycle (1932)
- 2. Formation and transformation of three amino acids namely ornithine, citrulline and arginine one after the other constitute the major steps in this cycle

277 (a)

Sodium reabsorption in DCT is controlled primarily by aldosterone. Increase in plasma aldosterone concentration increases Na⁺ reabsorption.

278 (d)

In humans, the principle nitrogenous excretory compound (*i.e.*, urea) is synthesized in liver by ornithine cycle. Urea is eliminated mostly through kidney as excretory product.

279 **(c)**

Liver, the largest gland in our body secretes bile containing substances like bilirubin, biliverdin, cholesterol, degraded steroid hormones, vitamins and drugs. Most of these substances ultimately pass out along with digestive wastes

280 (a)

The normal concentration of sodium in the blood plasma is 150 mEq/L. If this level drops below 120 mEq/L, the result may be lethargy, coma or death. Unlike deficiencies of other important fluid constituents, the most common cause of this drop in sodium concentration is not a nutritional deficit of sodium, but rather an excess of water.

281 **(b)**

A terrestrial animal must be able to conserve water.

282 **(b)**

The urine is hypertonic (*i. e*, it has higher osmotic pressure than the blood plasma).

283 **(b)**

Wolffian body is also known as mesonephros.

284 **(d)**

Kidneys do not take part in destruction of dead blood corpuscles.

285 **(d)**

Blood of filtered so finely through the these membranes (three layers) that almost all the constituents of the plasma except the proteins, RBC and WBC pass into the lumen of the Bowman's capsule. Therefore, it is considered as the process of ultra filtration

286 **(d)**

Hepatopancreas is not an excretory organ. Hepatopancreas is an organ of the digestive track of arthrous, mollusks and fish. It provides function as same on liver and pancreas of mammals.

287 **(c)**

Epithelium cells of the Bowman's capsule. Glomerular capillary blood pressure causes the filtration of the blood through three layers, *i.e.*, (i) The endothelium of the glomerular blood vessels

(ii) Epithelium of Bowman's capsule

(iii) Basement membrane between these two layers

The epithelium of the Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called podocytes

288 **(d)**

Functioning of kidney is regulated by (i) Hypothalamus by ADH or vasopressin hormone

(ii) JGA by renin angiotensin mechanism

(iii) Heart by ANF (Atrial Natriuretic Factor)

289 **(d)**

In nephron, reabsorption from filtrate is minimum in collecting duct, while maximum in proximal convoluted tubule.

290 **(d)**

Waste like urea, uric acid, CO_2 , H_2O and ions gets accumulated in the body. Their accumulation occurs by the metabolic activities or excess ingestion

291 **(a)**

The malpighian corpuscle, PCT and DCT of the nephrons are situated in the cortex or cortical part of the kidney whereas the loop of Henle dips into the medullary part of the kidney

292 **(b)**

Human blood normally contains 18 to 38 mg of urea per 100 mL blood.