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Q-1 - 34596665

Nitrogenous waste products are eliminated mainly as

- (A) urea in tadpole and ammonia in adult frog
- (B) ammonia in tadpole and urea in adult frog
- (C) urea in both tadpole and adult frog
- (D) urea in tadpole and uric acid in adult frog

CORRECT ANSWER: B

SOLUTION:

Ammonia is the main nitrogenous waste. It is soluble in water and highly toxic. A large amount of water is

requires for its excretion. Tadpole is aquatic and lives in plenty of water so, nitrogenous wastes in tadpole are eliminated as ammonia. Frog being amphibious excretes its nitrogenous wastes as urea.

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Q-2 - 34596658

Uric acid is nitrogenous waste in

- (A) mammals and molluscs
- (B) birds and lizards
- (C) frog and cartilaginous fishes
- (D) insects and bony fishes

CORRECT ANSWER: B

SOLUTION:

Uric acid is least soluble nitrogenous waste and 1 g of it needs only 10 mL of water to be expelled out of body.

Another advantage of it is that it is least toxic among all nitrogenous wastes and can be retained in the body for longer period, so it is of greater advantage to animals which have limited access to water like birds and lizards.

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Q-3 - 34596653

If kidneys fails to reabsorb water, the effect on tissue would

- (A) remain unaffected
 - (B) shrink and shrivel
 - (C) absorb water from blood plasma
 - (D) take more O_2 from blood
-

CORRECT ANSWER: B

SOLUTION:

If kidney fails to reabsorb water the concentration of urine will be low and urination will be more frequent, a condition called polyuria as a result, the tissues of the body will be dehydrated and shrink.

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Q-4 - 34596649

In adult Frog, the kidney is

- (A) pronephros
 - (B) mesonephros
 - (C) metanephros
 - (D) opisthonephros
-

CORRECT ANSWER: B

SOLUTION:

Mesonephric kidney consists of a large number of tubules which develop internal glomeruli enclosed in capsules forming Malpighian bodies. In amphibians, (e.g. frog) it is functional both in embryo as well as adults.

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Q-5 - 34596648

In ureotelic animals, urea is formed by

(A) Ornithine cycle

(B) Cori cycle

(C) Krebs' cycle

(D) EMP pathway

CORRECT ANSWER: A

SOLUTION:

Urea is the main nitrogenous excretory product of ureotelic animals. It is produced by liver cells from deaminated excess amino acids via urea cycle, also called Ornithine cycle or Krebs-Henseleit cycle.

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Q-6 - 34596645

Aquatic reptiles are

(A) ammonotelic

(B) ureotelic

(C) ureotelic in water

(D) ureotelic over land

CORRECT ANSWER: B

SOLUTION:

Ureotelic animals include, Ascaris earthworm, cartilaginous fishes, semiaquatic amphibians aquatic or semiaquatic reptiles like turtles and alligators.

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Q-7 - 34596636

Which one of the following is correctly matched pair of the given secretion and its primary role in human physiology?

(A) Sebum → Sexual attraction

(B) Sweat → Thermoregulation

(C) Saliva → Tasting food

(D) Tears → Excretion of salts

CORRECT ANSWER: B

SOLUTION:

Sweat glands are coiled tubular glands situated in the dermis and connected to a sweat duct which open as pore on the surface of the skin. These secrete sweat which contains 0.1-04% of sodium chloride, sodium acetated and urea.

Sweating occurs when the body temperature increases.

As sweat evaporates from the body as latent heat of vaporation and in this way sweat reduces body temperature.

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In Protozoa like Amoeba and Paramecium, an organelle is found for osmoregulation which is

(A) contractile vacuole

(B) mitochondria

(C) nucleus

(D) food vacuole

CORRECT ANSWER: A

SOLUTION:

Unicellular organisms such as Amoeba, Paramecium have some organelles. These are freshwater animals i.e., they live in hypotonic solution. Therefore, water flows from outside to inside of the body of the organism.

The contractile vacuoles in these organisms collect this excess water and gradually increase in size. When the

vacuoles reach a critical size they contract, squeezing out their contents through the process of simple diffusion.

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Q-9 - 34596601

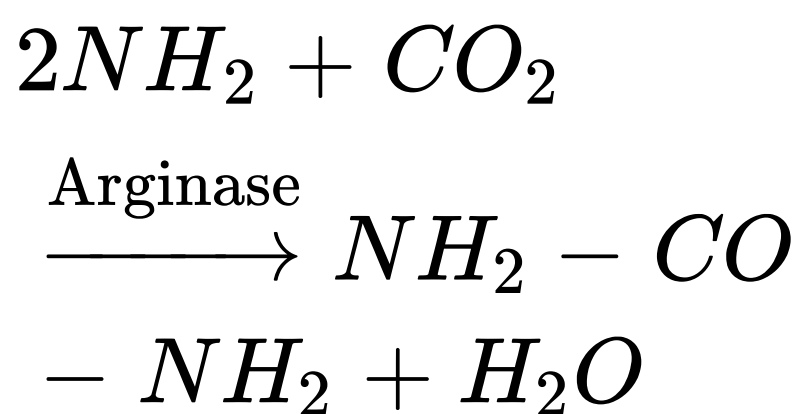
The principal nitrogenous excretory compound in humans is synthesised

- (A) in kidneys but eliminated mostly through liver
- (B) in kidneys as well as eliminated by kidneys
- (C) in liver and also eliminated by the same through bile
- (D) in the liver but eliminated mostly through kidneys

CORRECT ANSWER: D

SOLUTION:

In humans, the principal nitrogenous excretory compound (i.e., urea) is synthesised in liver by Ornithine cycle and is eliminated mostly through kidney as nitrogenous excretory product. In liver, one molecule of CO_2 is activated by biotin and combines with two molecules of NH_3 in the presence of carbamyl phosphate and one molecule of H_2O is released. Carbamyl phosphate reacts with Ornithine and forms Citrulline. Citrulline combines with another molecule of ammonia and form arginine that is broken into urea and Ornithine in the presence of an enzyme arginase and water.



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Q-10 - 23778913

Columns of Bertin are found in

- (A) Testes
 - (B) Ovaries
 - (C) Kidney
 - (D) Liver
-

CORRECT ANSWER: C

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Q-11 - 23778915

The yellow colour of urine is due to the presence of

- (A) Uric acid

(B) Urea

(C) Urochrome

(D) Melanin

CORRECT ANSWER: C

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Q-12 - 23778917

Certain carbonates and phosphates are removed by

(A) skin

(B) Liver

(C) Kidney

(D) None of the above

CORRECT ANSWER: A

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Q-13 - 23778947

The pH of human urine is approximately

- (A) 7.1
- (B) 6.0
- (C) 8.4
- (D) 9.9

CORRECT ANSWER: B

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Q-14 - 23779276

which one is both osmoregulator as well as nitrogenous products

(A) NH_3

(B) Urea

(C) Uric acid

(D) All the above

CORRECT ANSWER: B

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Q-15 - 14145709

Which one of the following organisms is correctly matched with its excretory organs?

(A) Humans-Kidneys, sebaceous glands and tear glands

(B) Earthworm-Pharyngeal, integumentary and septal nephridia

(C) Cockroach-Malpighian tubules and enteric caeca

(D) Frog-Kidneys, skin and buccal epithelium

CORRECT ANSWER: B

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Q-16 - 34596661

Glucose is taken back from glomerular filtrate through

(A) active transport

(B) passive transport

(C) osmosis

(D) diffusion

CORRECT ANSWER: A

SOLUTION:

Glucose is taken back from glomerular filtrate through active transport in proximal convoluted tubule.

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Q-17 - 34596668

Brush border is characteristic of

- (A) neck of nephron
- (B) collecting tube
- (C) proximal convoluted tubule
- (D) All of the above

CORRECT ANSWER: C

SOLUTION:

Proximal convoluted tubule is present in cortex and is

convoluted. It is about 12-24 mm in length. It is lined by brush bordered cuboidal epithelium with numerous microvilli. These cells have numerous mitochondria for active transport.

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Q-18 - 34596666

Under normal conditions which one is completely reabsorbed in the renal tubule ?

- (A) Urea
- (B) Uric acid
- (C) Salts
- (D) Glucose

CORRECT ANSWER: D

SOLUTION:

Glucose is high threshold substance, i.e., it is totally or mostly reabsorbed from the nephric filtrate in the blood capillaries.

Renal threshold, i.e., upper limit of kidney to reabsorb such high threshold substances of kidney for reabsorption of glucose is about 180 mg/100 mL of nephric filtrate. When blood sugar level reaches beyond this sugar also appears in urine.

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Q-19 - 14145722

Which one of the following is not a part of renal pyramid?

(A) Peritubular capillaries

(B) Convoluted tubules

(C) Collecting ducts

(D) Loop of Henle

CORRECT ANSWER: B

SOLUTION:

Renal pyramids are the conical areas of medulla.

Peritubular capillaries, collecting ducts and loop of Henle lie in the renal pyramids while convoluted tubules lie in the cortex of the kidney.

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Q-20 - 14145746

Effective filtration pressure in glomerulus is caused due to

(A) powerful pumping action of the heart

(B) secretion of adrenaline

(C) afferent arteriole is slightly wider than efferent arteriole

(D) vacuum develops in proximal convoluted tubule and sucks and blood.

CORRECT ANSWER: C

SOLUTION:

The diameter of afferent arteriole is larger than the efferent arteriole. This increases the volume of blood in glomerulus and increases the filtration rate. This causes the effective filtration pressure which is the total pressure that promotes filtration.

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Q-21 - 23778992

Which blood vessel contains the least amount of urea ?

- (A) Hepatic vein
 - (B) Renal vein
 - (C) Hepatic portal vein
 - (D) Renal artery
-

CORRECT ANSWER: B

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Q-22 - 14145763

Which one of the following statements in regard to the excretion by the human kidneys is correct?

- (A) Descending limb of loop of Henle is impermeable to water.
- (B) Distal convoluted tubule is incapable of reabsorbing

Na^+ ions.

(C) Nearly 99 per cent of the glomerular filtrate is reabsorbed by the renal tubules.

(D) Ascending limb of loop of Henle is impermeable to electrolytes.

CORRECT ANSWER: C

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Q-23 - 14145765

Which one of the following is a correct pair showing the function of a specific part of the human nephron?

(A) Podocytes: create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule

(B) Henle's loop : most reabsorption of the major

substances from the glomerular filtrate

(C) Distal convoluted tubule: reabsorption of K^+ ions into the surrounding blood capillaries

(D) Afferent arteriole: carries the blood away from the glomerulus towards renal vein

CORRECT ANSWER: A

SOLUTION:

Most reabsorption of the major substances from the glomerular filtrate takes place in proximal convoluted tubule. In DCT, selective secretion of H^+ and K^+ occur to maintain pH and Na-K balance in blood.

Afferent arteriole carries the blood towards the glomerulus.

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Liquid which collects in the cavity of Bowman's capsule is

- (A) Concentrated urine
- (B) Plasma minus blood proteins
- (C) Glycogen and water
- (D) Sulphates and water

CORRECT ANSWER: B

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Which of the following is removed from the filtrate at loop of Henle?

(A) Amino acids

(B) Hormones

(C) Water

(D) Glucose

CORRECT ANSWER: C

SOLUTION:

In descending limb of loop of Henle, water is reabsorbed due to increasing osmolarity of interstitial fluid

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Q-26 - 34596643

The ability of producing concentrated (hypertonic) urine in vertebrates generally depends on

(A) area of Bowman's capsule epithelium

(B) length of Henle's loop

(C) length of the proximal convoluted tubule

(D) capillary network forming glomerulus

CORRECT ANSWER: B

SOLUTION:

Length of Henle's loop determined the concentration of urine. Urine is concentrated through counter current mechanism which involves (a) the loop of Henle (b) the vasa recta (c) nearby collecting tubules and ducts, (d) the interstitial fluid.

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The longest loop of Henle is found in

- (A) Kangaroo Rat
 - (B) Rhesus Monkey
 - (C) Opossum
 - (D) Rabbit
-

CORRECT ANSWER: A

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Q-28 - 23779231

Vasopressin stimulates reabsorption of water and reduction of urine secretion. Hence vasopressin is otherwise called

- (A) Synovial fluid
- (B) Neurotransmitter

(C) Antidiuretic hormone

(D) Growth regulating substance

CORRECT ANSWER: C

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Q-29 - 14145772

Match column I with column II and select the correct option from the codes given below.

Column I

A. PCT

B. DCT

C. Loop of Henle

D

Counter current mechanism

E. Renal corpuscle

Column II

(i). Minimum reabsorption

(ii). Filtration of blood

(iii)

Reabsorption of 70-80%

(iv). Ionic balance

(v)

Maintenance of concentration

(A) A-(iii),B-(iv),C-(i),D-(v),E-(ii)

(B) A-(iii),B-(v),C-(iv),D-(ii),E-(i)

(C) A-(i),B-(iii),C-(ii),D-(v),E-(iv)

(D) A-(iii),B-(i),C-(iv),D-(v),E-(ii)

CORRECT ANSWER: A

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Q-30 - 14145785

Which someone drinks lot of water, ADH release is suppressed.

(A) When someone drinks lot of water, ADH release is suppressed.

(B) Exposure to cold temperature stimulates ADH Release

(C) An increase in glomerular blood flow stimulates formation of angiotensin II.

(D) During summer, when body loses lot of water by evaporation, the release of ADH is suppressed.

CORRECT ANSWER: A

SOLUTION:

When someone drinks lot of water, the volume of body fluid increases, this switches off the osmoreceptors in the body and suppresses the ADH release

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Q-31 - 23778970

Collecting tubes are lined by

(A) Squamous epithelium

(B) Columnar epithelium

(C) Cuboidal epithelium

(D) Cuboidal and columnar epithelium

CORRECT ANSWER: C

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Q-32 - 14145740

The dotted appearance of cortex of kidney is due to

(A) ducts of Bellini

(B) convoluted parts

(C) loop of Henle

(D) collecting tubes.

CORRECT ANSWER: B

SOLUTION:

The dotted appearance of cortex of kidney is due to the presence of convoluted parts of the tubule (proximal and distal convoluted tubules).

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Q-33 - 14145750

A fall in glomerular filtration rate (GFR) activates

- (A) juxtaglomerular cells to release renin
- (B) adrenal cortex to release aldosterone
- (C) adrenal medulla to release adrenaline
- (D) posterior pituitary to release vasopressin.

CORRECT ANSWER: A

SOLUTION:

A fall in GFR can stimulate the JG cells to release renin which can stimulate the glomerular blood flow and thereby the GFR comes back to normal.

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Q-34 - 14145782

Diuresis is the condition in which

- (A) the excretory volume of urine increases
- (B) the excretory volume of urine decreases
- (C) the kidneys fail to excrete urine
- (D) the water balance of the body is disturbed.

CORRECT ANSWER: A

Q-35 - 34596576

A decrease in blood pressure / volume will not cause the release of

- (A) renin
- (B) atrial natriuretic factor
- (C) aldosterone
- (D) ADH

CORRECT ANSWER: B

SOLUTION:

A decrease in blood pressure/volume stimulates the hypothalamus to release ADH (Anti Diuretic Hormone) as well as JGA (Juxtaglomerular Apparatus) cells to release renin. Renin by renin angiotensin mechanism

activate the adrenal cortex to release aldosterone.

Atrial Natriuretic Factor (ANF) is produced by atria of heart during increased blood pressure/volume. It can cause vasodilation and thereby, decrease the blood pressure, therefore, option (b) is correct

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Q-36 - 34596620

Angiotensinogen is a protein produced and secreted by

- (A) macula densa cells
- (B) endothelial cells (cells lining the blood vessels)
- (C) liver cells
- (D) Juxtaglomerular (JG) cells

CORRECT ANSWER: C

SOLUTION:

Angiotensinogen is a plasma protein produced and secreted by the liver cells. Renin is secreted from juxtaglomerular cells and acts enzymatically on angiotensinogen to release 10 amino acid containing peptide angiotensin-I. Macula densa is actually a plaque in wall at the end of thick ascending limb of nephrons.

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Q-37 - 34596593

Which one of the following statement is correct respect to kidney function regulation

(A) Exposure to cold temperular stimulates ADH release

(B) An increase in glomerular blood flow stimulates formation of angiotensin-II

(C) During summer when body loses lot of water by evaporation the release of ADH is suppressed

(D) When someone drinks lot of water ADH release is stopped

CORRECT ANSWER: D

SOLUTION:

When someone drinks lot of water which is not required by body, the osmoregulation of the blood will decrease.

The decrease in osmoregulation will inhibit the release of ADH.

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Q-38 - 14145769

Which of the following options has the correct pair of nephron parts that maintain pH and ionic balance of blood?

- (A) Proximal convoluted tubule and Henle's loop
 - (B) Distal convoluted tubule and collecting duct
 - (C) Proximal convoluted tubule and glomerulus
 - (D) collecting duct and Henle's loop
-

CORRECT ANSWER: B

SOLUTION:

DCT maintains the pH and ionic balance in the blood by reabsorption of Na^+ , water, HCO_3^- and selective secretion of H^+ , K^+ and NH_3 . Collecting duct plays a role in the maintenance of pH and ionic balance of blood by reabsorption of water, and elective secretion of H^+ and K^+ ions.

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Select the incorrect statement regarding mechanism of urine formation in man.

- (A) The glomerular filtration rate is about 125 ml per minute.
- (B) The ultrafiltration is opposed by the colloidal osmotic pressure of plasma.
- (C) Aldosterone induces greater reabsorption of sodium
- (D) The counter current system contributes in diluting the urine.

CORRECT ANSWER: D

SOLUTION:

Counter current mechanism helps to concentrate the

urine.

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Q-40 - 23779213

Chemical composition of renal calculi, besides uric acid is

- (A) Bile salts
- (B) Barium chloride
- (C) Zinc sulphate
- (D) Calcium oxalate

CORRECT ANSWER: D

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Q-41 - 23778963

In human beings, gout is caused by

- (A) Deficiency of iodine
 - (B) Excessive secretion of thyroid
 - (C) Excessive liberation of uric acid
 - (D) Deposition of uric acid
-

CORRECT ANSWER: D

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Q-42 - 34596652

Cholera patient is administered by 'saline drip' because

- (A) Cl^- ions are important component of blood plasma
- (B) Na^+ ions help to retain water in the body
- (C) Na^+ ions are important in transport of substances across membrane

(D) Cl^+ ions help in the formation of HCl in stomach for digestion

CORRECT ANSWER: B

SOLUTION:

Severe diarrhoea, vomiting, watery stools are the chief symptoms of cholera. All these lead to dehydration. The toxin secreted by *Vibrio cholerae* causes a continuous activation of adenylate cyclase of intestinal epithelial cells.

The resultant high concentration of cAMP triggers continual secretion of Cl^- , HCO_3^- and water into the lumen of the intestine. Administration of saline not only supports the sodium-potassium pump through which water in cell is restored, but glucose is also symported along with sodium.

Q-43 - 34596646

A condition of failure of kidney to form urine is called

- (A) deamination
- (B) entropy
- (C) anuria
- (D) None of these

CORRECT ANSWER: C

SOLUTION:

The terms anuria, oligonuria, polynuria and dysuria are used for absence of urine scanty urine, large amounts of urine and painful urination respectively. Deamination is the removal of an amino ($-NH_2$) group frequently

from an amino acid by transaminase enzymes.

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Q-44 - 23778949

Haematuria is the disorder involving

- (A) The loss of blood through the urine
- (B) Loss of haemoglobin in R.B.C.
- (C) Loss of glucose in urine
- (D) The increase in concentration blood urea

CORRECT ANSWER: A

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Q-45 - 23778956

Excretion of bile pigments in the urine indicates

(A) Anaemia

(B) Diabetes

(C) Rickets

(D) Jaundice

CORRECT ANSWER: D

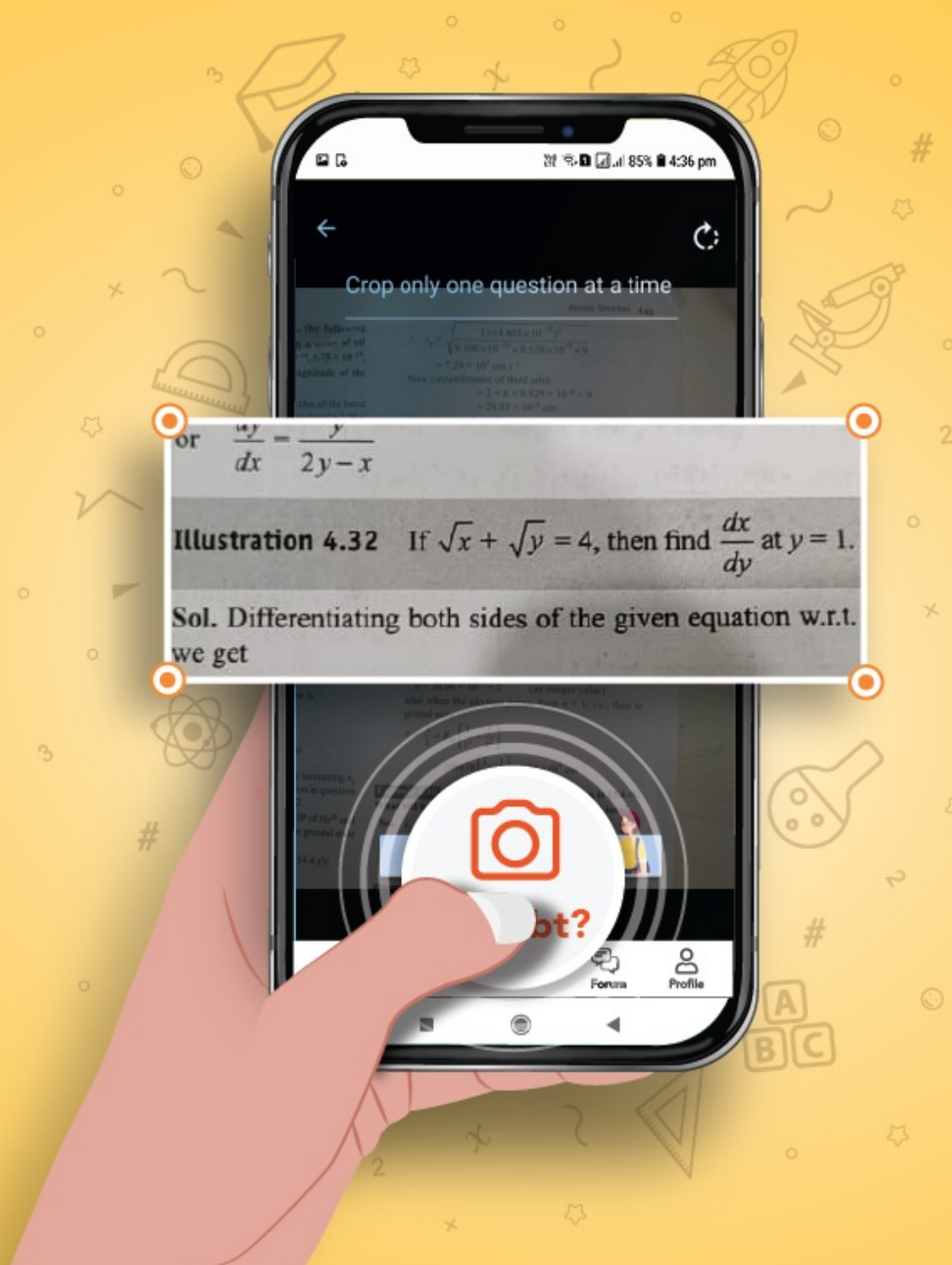
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