1. Nov/2021/Paper_41/No.1

(a) Fig. 1.1 is a diagram of a kidney nephron and some of its blood vessels.

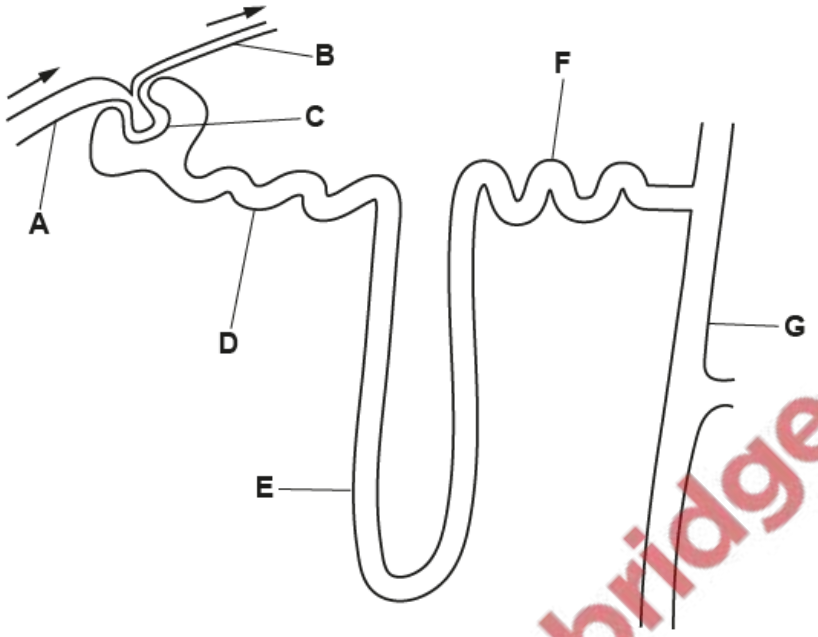

Fig. 1.1

With reference to Fig. 1.1, complete Table 1.1 using the letters **A – G**.

Each letter may be used once, more than once or not at all.

Table 1.1

description	letter
efferent blood vessel	.....
part of nephron containing cells that respond to ADH	.....
part of nephron where podocyte cells are located	.....
part of nephron containing cells that are located in the medulla	.....

[4]

(b) Describe **and** explain how the cells of the proximal convoluted tubule are adapted to carry out selective reabsorption.

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..... [5]

(c) Fig. 1.2 shows the concentrations of ADH in the blood at different percentage changes in water potential of the blood.

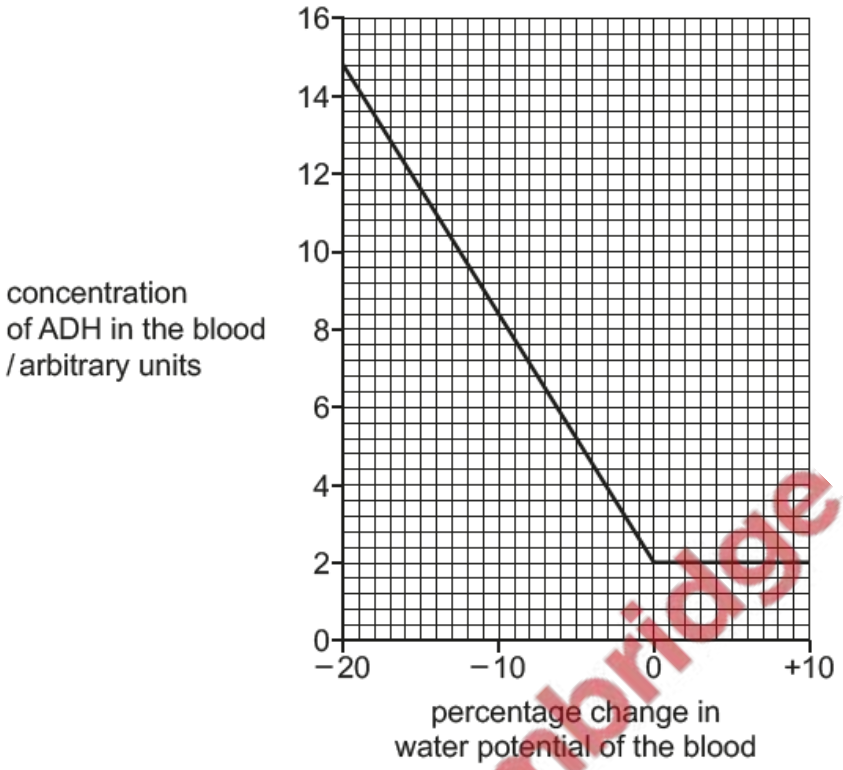

Fig. 1.2

(i) Describe the trend shown in Fig. 1.2.

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..... [2]

(ii) Sometimes a person will have a low concentration of ADH in the blood even though there is a change in the water potential.

Suggest **one** effect on the circulatory system of a low concentration of ADH in the blood.

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..... [1]

[Total: 12]

(a) The Bowman's capsule of a nephron is involved in ultrafiltration.

Fig. 1.1 is a diagram of part of a Bowman's capsule and glomerulus.

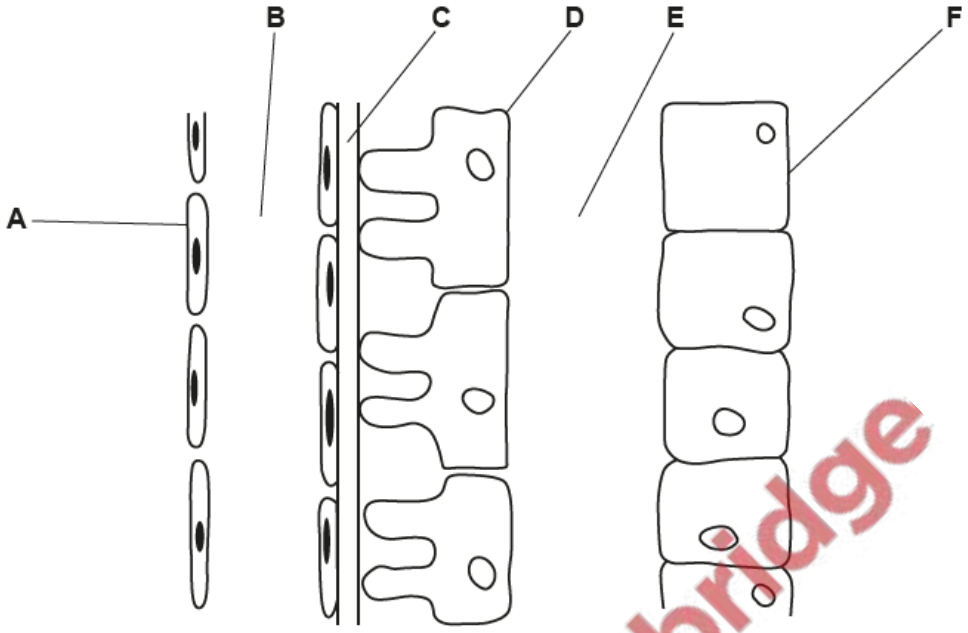

Fig. 1.1

With reference to Fig. 1.1, complete Table 1.1 using the letters **A – F**.

Each letter may be used once, more than once or not at all.

Table 1.1

feature	letter
glomerular filtrate	.....
basement membrane	.....
podocyte cell	.....
capillary endothelial cell	.....

[4]

(b) Describe **and** explain how the structures in the Bowman's capsule and its associated blood supply are adapted to allow ultrafiltration to take place.

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..... [5]

(c) The glomerular filtration rate (GFR) is the rate at which blood plasma is filtered in the Bowman's capsule.

Fig. 1.2 shows the relationship between GFR and mean renal arterial blood pressure.

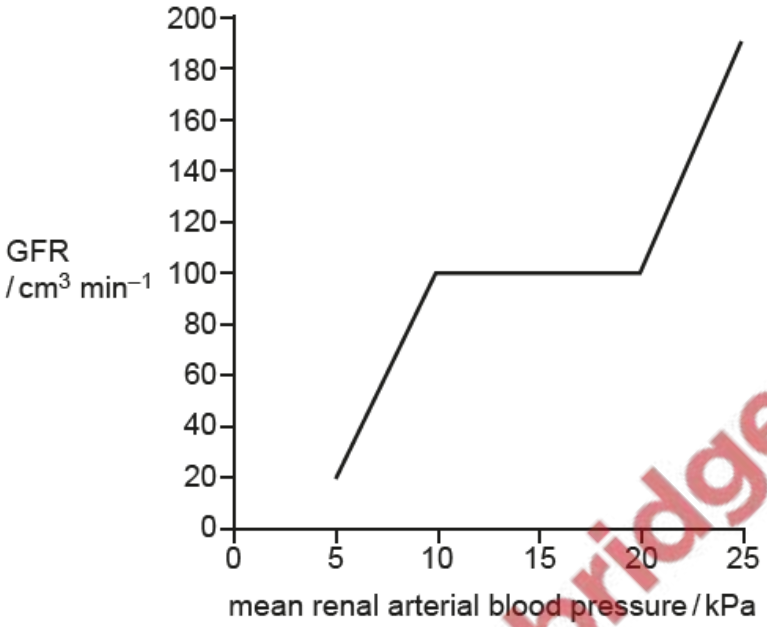

Fig. 1.2

(i) Comment on the relationship between GFR and mean renal arterial blood pressure.

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..... [2]

(ii) Suggest **one** reason why the GFR of a person might decrease.

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..... [1]

[Total: 12]

3. Nov/2021/Paper_42/No.9(a)

(a) Describe the roles of ADH **and** the collecting ducts in osmoregulation. [9]