A. FUNCTIONS

1. **Exchanges oxygen** and **nutrients** from **maternal** to **fetal** blood

2. **Exchanges CO_2** and **waste** from **fetal** to **maternal** blood

3. **Exchanges antibodies** from **maternal** to **fetal** blood

4. Takes **over** the **role** of the **corpus luteum**

5. **Produces hormones** for the pregnancy:

HORMONE	FUNCTION(S)
HCG	**Maintains** the **corpus luteum**
Progesterone	**Maintains** the **uterus lining** **Prevents** the **uterus wall contracting**
Oestrogen	**Increases** the number of **oxytocin receptors** in the **uterus wall** for **stronger contractions** Increases **mammary gland growth**

6. A **barrier** to **prevent** maternal and fetal blood from **mixing** so **blood clots do not form**

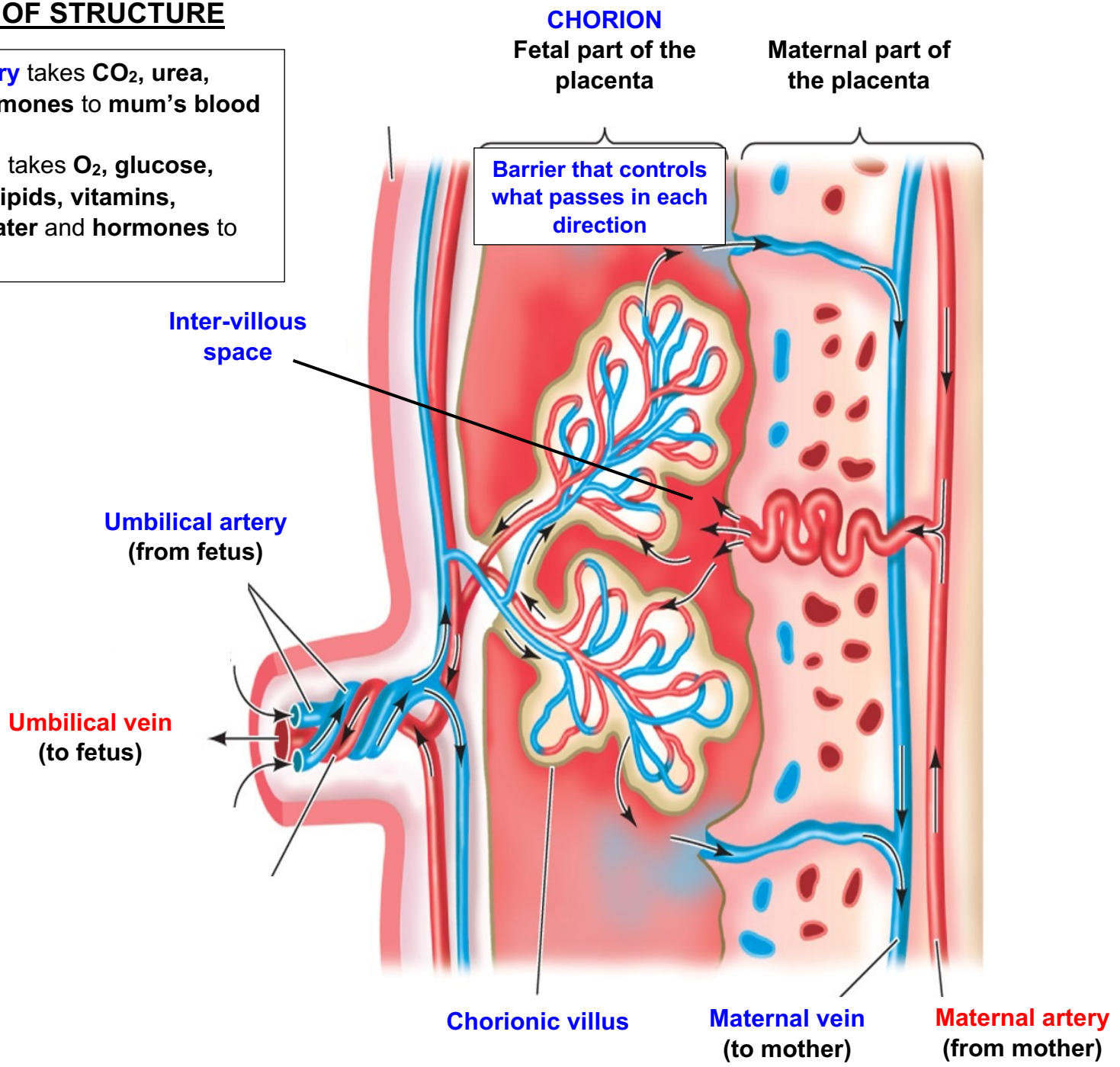
7. Prevents **damage** to the **fetus** from **high pressure blood** in **mum's arteries**

B. BASIC STRUCTURE

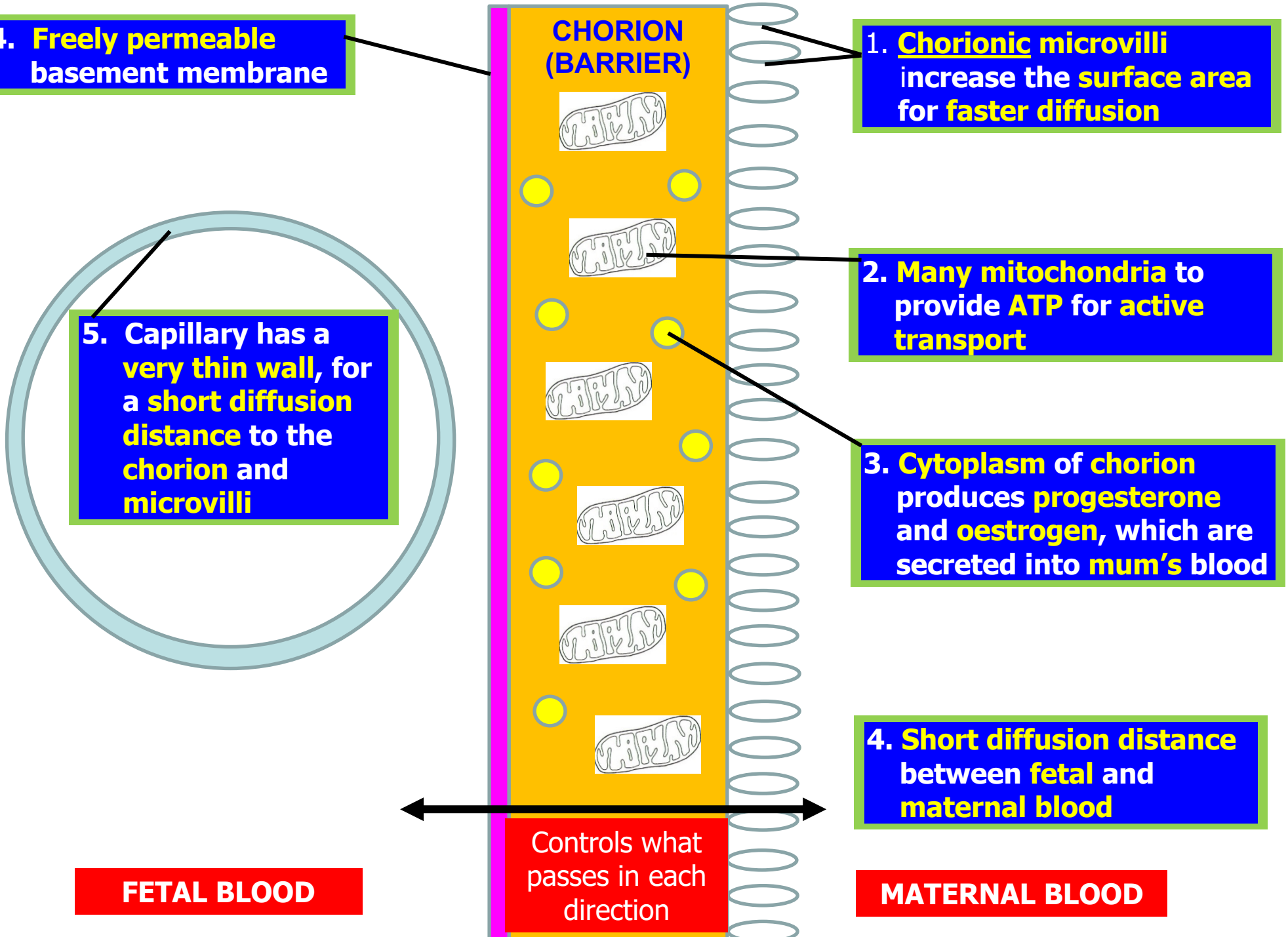
- **Disc-shaped** structure
- **Embedded** in the **uterus wall**
- **Connected** to **fetus** by the **umbilical cord**
- Contains **fetal** and **maternal structures**/tissues
- **Maternal** blood and **fetal** blood flow **close** to each other but **never mix**

C. OVERVIEW OF STRUCTURE

- **Umbilical artery** takes **CO_2, urea, water** and **hormones** to **mum's blood**
- **Umbilical vein** takes **O_2, glucose, amino acids, lipids, vitamins, antibodies, water** and **hormones** to **fetal blood**



D. HOW THE STRUCTURE OF THE PLACENTA IS ADAPTED TO ITS FUNCTIONS



D. EXAM QUESTIONS

Explain the structure and role of the placenta. [8 marks]

a. disc-shaped structure/embedded in uterus wall;

b. connected to fetus by umbilical cord;

c. contains fetal and maternal tissues;

d. materials exchanged/diffuse (through membranes) between mother and fetal blood;

e. oxygen/glucose/amino acids/antibodies diffuses to fetus;

f. carbon dioxide/urea/waste diffuses to mother;

g. maternal antibodies protect the fetus;

h. fetal and maternal blood never mixes/flow close to each other;

i. protects fetus from high maternal blood pressure / ensures that blood does not clot if different blood groups;

j. chorionic villi provide large surface area for exchange/diffusion (of materials);

k. many mitochondria to produce ATP for active transport;

l. small diffusion distance between fetal and maternal blood;

m. takes over role of corpus luteum (to produce hormones);

n. maintains/prevents degeneration of corpus luteum by producing HCG;

o. produces oestrogen to increase number of oxytocin receptors (on uterus wall) for positive feedback/stronger contractions;

p. produces progesterone to inhibit uterus contractions/maintain thickness of uterus lining;

q. caffeine/drugs/alcohol/viruses from mother may damage fetal development;