VENOUS SYSTEM:

- Blood vessels that return blood from different parts of the body to the heart are called veins. The walls of veins are thin and non-muscular.
- Their lumen is wide and contains valves. Veins are superficial and blood flow in them is continuous. Veins always begin with capillaries.
- Wall of a vein is formed by three layers, namely, outer **tunica externa** (formed by collagen fibres), middle **tunica media** (formed by a thin layer of smooth muscles) and inner **tunica interna** or endothelium (formed by a layer of epithelial cells).
- The venous system of rabbit may be divided into three components, namely 1. System of vena cavae, 2. Hepatic portal system 3. Pulmonary system.

1. System of vena cavae:

- It includes three major veins or vena cavae. They are two anterior vena cavae (or pre caval veins) and a posterior vena cava(or post caval vein).

A. Anterior vena cavae (pre caval veins):

- The two precaval veins (left and right) collect blood from anterior parts of the body. They open into right auricle through separate openings. Each precaval vein is formed by the following veins:
- **i. External jugular vein:** It collects blood from the muscles of jaws, tongue and various parts of head. External Jugular veins of both sides are connected by a transverse jugular anastomosis.
- **ii. Internal jugular vein:** It collects blood from the brain and muscles of neck.
- **iii. Subclavian vein:** It collects blood from the fore limb of its side and also from shoulder. The right precaval vein also receives the following two veins, which are absent on left side.
- **a. Anterior intercostal vein** collects blood from anterior inter costal spaces.
- **b. Azygous cardinal vein** collects blood from posterior inter costal spaces and lumbar region.
- Few veins on the left side form a **hemiazygous vein**. It is connected to azygous cardinal vein through a transeverse anastamosis.
- A pair of **coronary veins** collects blood from muscles of heart and they open into left precaval vein just before it opens into the right auricle, through a common pore. This pore is guarded by **valve of Thebesius.**

B. Posterior vena cava (postcaval vein):

- There is one postcaval vein collecting blood from tail, hindlimbs and various parts of abdomen.
- A pair of **internal iliac veins** (hypogastric veins) and a pair of **external iliac veins** open into the postcaval vein.
- Each internal iliac vein collects blood from dorsal wall of pelvic cavity.
- Each external iliac vein is formed by **femoral vein** collecting blood from hind limb, **uterine vein** collecting blood from uterus in female, **vesicular vein** collecting blood from urinary bladder and **posterior epigastric vein** collecting blood from ventral abdominal wall.
- Caudal vein that collected blood from tail also opens into the postcaval vein.
- Postcaval vein extends anteriorly through the diaphragm and opens into the right atrium.
- On its way, postcaval vein receives blood from different parts through the following veins.
- **i. A pair of iliolumbar veins:** Collects blood from dorsal abdominal wall and muscles of back.
- **ii. A pair of gonadial veins:** Collects blood from gonads. In **males** these are called **spermatic veins** and in **females, ovarian veins.**
- **iii. A pair of renal veins:** Collects blood from kidneys.
- **iv. Two pairs of hepatic veins:** Collect blood from liver.
- **v. A pair of phrenic veins:** Collects blood from muscles of diaphragm.

2. Hepatic portal system:

- A vein that begins with capillaries in one (or some) organ(s) and supplies it to another organ (not to heart) is called a **portal vein**.
- Rabbit has hepatic portal system only. Renal portal system is absent. Hepatic portal system collects blood from stomach, intestine etc., and supplies it to the liver.
- Hepatic portal vein is formed by the union of the following veins :
- **i. A lienogastric vein -** collecting blood from stomach and spleen.
- **ii. A duodenal vein** - collecting blood from duodenum and pancreas.
- **iii. An anterior mesenteric vein** - collecting blood from ileum, caecum and colon.
- **iv. A posterior mesenteric vein** - collecting blood from rectum and anus.
- The hepatic portal vein reaches the liver and splits into capillaries in it.

3. **Pulmonary system:**

- It consists of a pair of pulmonary veins that carry oxygenated blood from lungs to the left auricle. They open into the left auricle through a common pore.