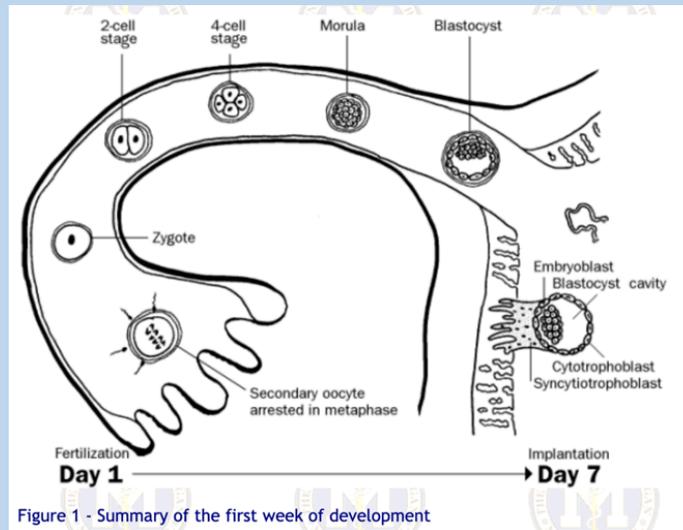
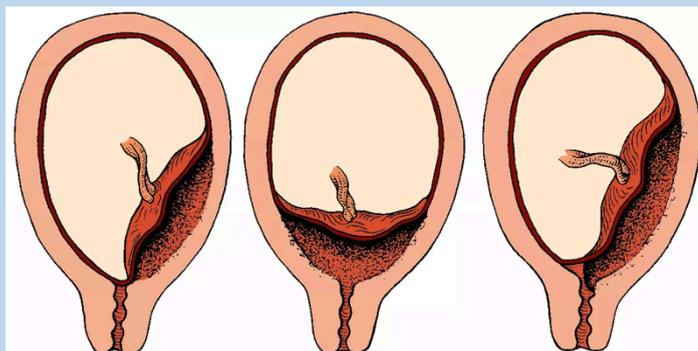


**SECTION I: 20 Points**

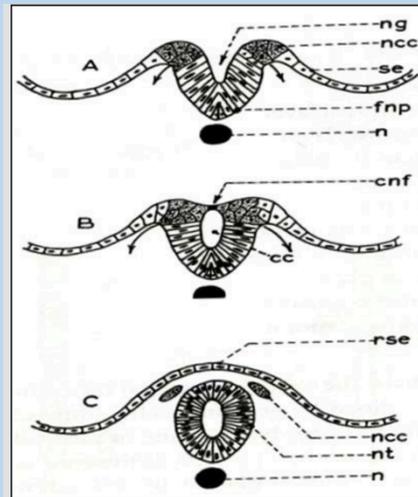
**The figure below summarises the first week of development**



- a.) Briefly describe the process of folliculogenesis/oogenesis (4 pts)
  
- b.) Implantation is the invasion and attachment of the embryo to the maternal endometrium. (4 pts, 2 pts for q. iii)
  - i. State the normal site of implantation-
  
  - ii. State the term that describes the implantation of the blastocyst in a location other than the uterus.
  
  - iii. List common sites for the above condition with reasons;-
  
  - iv. Describe the condition (with the variations illustrated (0.5 pts each)) shown in the image below and its implications (effect and solution (1.5 pts)). Hint: *An abnormality in implantation.* Total 2pts



- c.) In which cells is cyclic AMP formed in oogenesis, and what is its role? (1pt)
- d.) Describe the hormonal control of follicular growth and maturation. (3 pts)
- e.) The diagram illustrates the process involved in neurulation.



List the destination for neural crest cells originating in the cephalic region and at the trunk, (2 each). (2 pts)

Head:

Trunk:

**SECTION II: 15 Points**

Credits: Nahry O. Muhammad

**1. Select the most suitable answer from the options for each question. (5 pts)**

**i. When the amount of amniotic fluid exceeds two litres, the condition is called:**

- A. oligohydramnios
- B. polyhydramnios or hydramnios
- C. amnio-titis
- D. bag of waters
- E. hydro gravida

**ii. Failure of the brain to grow may result in:**

- A. plagiocephaly
- B. craniostenosis
- C. acrocephaly
- D. scaphocephaly
- E. microcephaly

**iii. Which of the following gives rise to the labia majora?**

- A. genital folds
- B. genital swellings
- C. genital tubercle
- D. urorectal gold
- E. inguinal fold

**iv. The fetal right atrium is mainly derived from:**

- A. primitive pulmonary vein
- B. primitive atrium

- C. right pulmonary vein
- D. sinus venarum
- E. sinus venosus

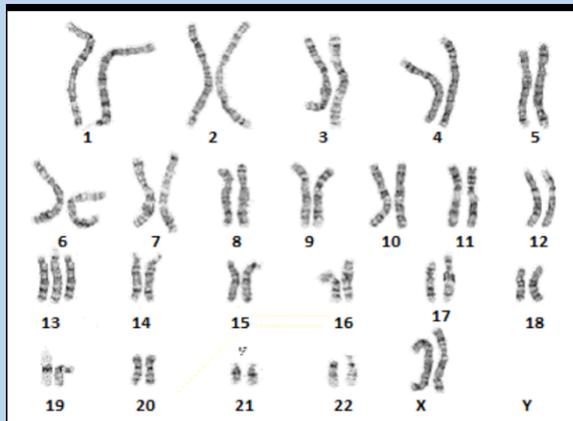
**v. Which of the following are associated with the 2nd pharyngeal arch?**

- A. the malleus bone
- B. facial nerve
- C. glossopharyngeal muscle
- D. the lower portion of the hyoid bone
- E. anterior belly of digastric

**2. Describe fetal circulation: (4 pts)**

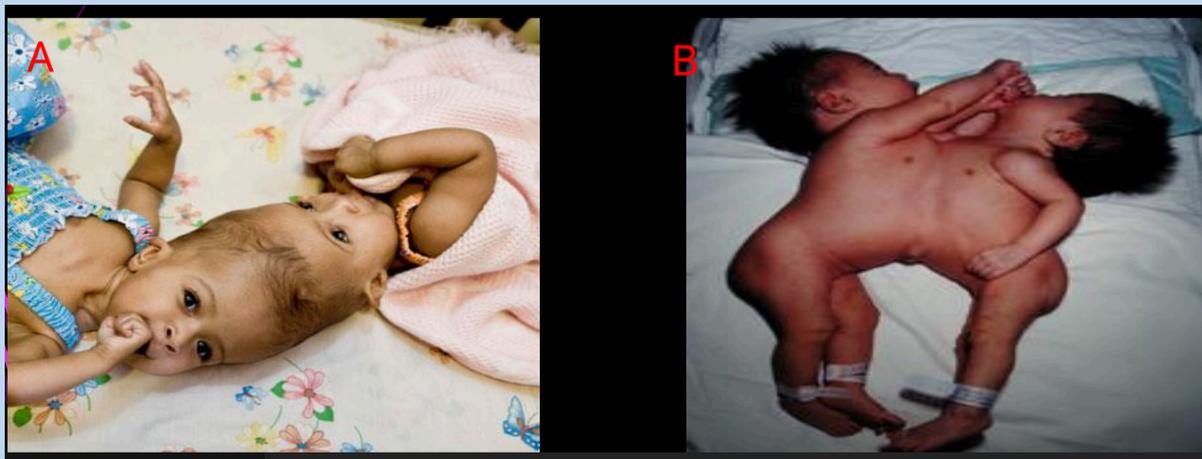
3. SPOT ON: Identify each condition associated with developmental stages in embryology. (6 pts; 1-2-3 respectively)

1.)



A)

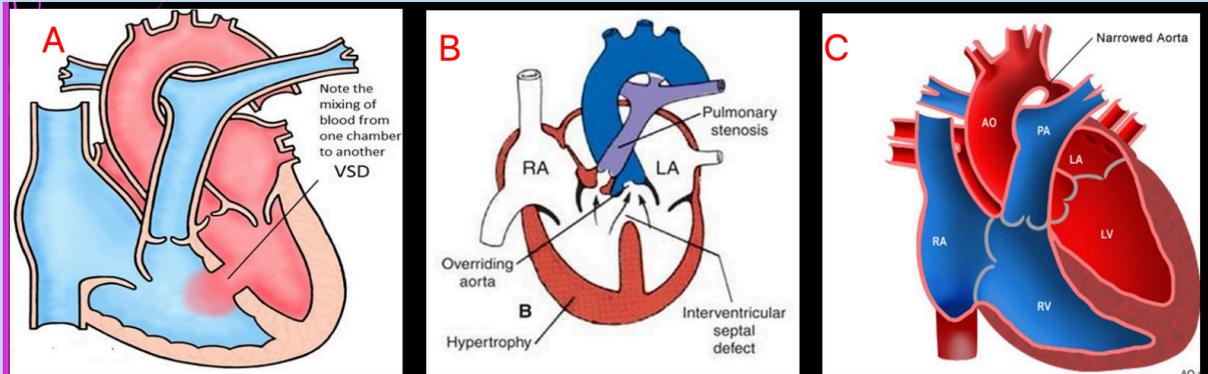
2.)



A)

B)

3.)



A)

B)

B)

### **SECTION III: 15 Points**

In the local hospital, during a routine check-up, a prenatal scan of a 5-and-a-month fetus detected an abnormal aortic valve, leading to a diagnosis of aortic stenosis, impending hypoplastic left heart syndrome, as well as severe mitral regurgitation.

**1. What is hypoplastic left heart syndrome? 2 pts**

**2. State the aetiology, risk factors and symptoms. 1+1+2 pts**

The mother and her unborn fetus were admitted immediately following the fetal echo. As per the patient's history, the mother's sibling had died at a young age after undergoing a heart transplant. The mother did not want her child to have to undergo transplantation. Statistics show that

babies with this combination of defects have only a 10% survival to six months of age.

**3. What other tests are required/recommended? 4 pts**

**4. What are the treatment options? Why do these combinations of defects have a poor prognosis?**

4+3 pts

After careful planning, the doctors discussed the option of in-utero fetal aortic valvuloplasty with the parents. Although this combination of defects has a very poor prognosis, the team was encouraged that they caught it in the second trimester, which is early for this combination of heart defects, and that the function of the left ventricle was still normal.

A successful in utero fetal aortic valvuloplasty was done and it was performed at 24 weeks gestation. The procedure was uncomplicated and was completed with only four minutes spent in the fetal heart, resulting in a full-term birth and discharge at four days of age. The intervention on the aortic valve completely reversed the impending HLHS and the severe mitral regurgitation to the point that the full-term baby was discharged from the hospital with his mother without the need for a procedure or surgery prior to discharge – the best possible outcome and one not before seen with this combination of defects.



**5. Explain the procedure of fetal aortic valvuloplasty. At which stage of gestation can this procedure be performed? 3 pts**