

CONTINUITY OF LIFE DEVELOPMENTAL BIOLOGY

ONE MARK QUESTIONS

1. What is gametogenesis?

Ans: The process of formation of gametes is known as gametogenesis.

2. Name the structural and functional units of mammalian testis.

Ans: Seminiferous tubules.

3. What are primordial germ cells (primary germ cells) ?

Ans: The cells which develop into gametes are called primordial germ cells .

4. Name the cells which undergo first meiosis during spermatogenesis.

Ans: Primary spermatocytes.

5. What is spermateleosis (spermiogenesis)?

Ans: The process of conversion of non – motile and non – functional spermatids into motile and functional sperms is called spermateleosis.

6. Name the type of cells in the seminiferous tubule which nourish the sperm.

Ans: Sertoli cells. (Sustenticular cells)

7. How many sperms are produced from each primary spermatocyte?

Ans: Four sperms

8. Name the cells which undergo first meiosis during oogenesis.

Ans: Primary oocytes.

9. How many ova are produced from each primary oocyte?

Ans: Only one haploid ovum.

10. Name the phase in oogenesis during which vitellogenesis occur.

Ans: Growth phase.

11. What is nebenkern ?

Ans: The axoneme is surrounded by a spiral sheath of mitochondria is called nebenkern.

12. Which cell organelle gives rise to acrosome part of the sperm?

Ans: Golgi bodies / Golgi apparatus

13. Which part of the sperm has the Nebenkern?

Ans: Middle piece.

14. What is manchette?

Ans: It is a thin layer of cytoplasm found in the middle piece of the sperm.

15. What are egg membranes ?

Ans: The egg is surrounded by additional protective layers called egg membranes or egg envelopes.

16. What is deuteroplasm (yolk)?

Ans: Deuteroplasm (yolk) is reserved food material present in the ooplasm(cytoplasm) of the egg.

17. Which is the reserve food of ovum (egg)?

Ans: Yolk or Vitellin or Deutroplasm or Metaplasm

18. What are gamones?

Ans: The hormones / chemical substances secreted by the gametes during fertilization.

19. Name the space found between plasma membrane and vitelline membrane of the egg.

Ans: Peri-Vitelline space.

20. What is fertilization (syngamy)?

Ans: The process of fusion of haploid sperm and haploid ovum to form a diploid zygote, (oosperm) is called fertilization.

21. What is monospermy?

Ans: The entry of a single sperm into the egg during fertilization is called monospermy.

22. What is Amphimixis?

Ans: The fusion of haploid sperm nucleus with haploid ovum nucleus is called Amphimixis (nuclear fusion)

23. Name the area of zygote of frog which does not show pigmentation.

Ans: Grey crescent area.

24. What is grey crescent?

Ans: Grey crescent is a crescent shaped less pigmented area of the fertilized egg of frog formed just opposite to the entry point of sperm.

25. What is blastulation?

Ans: The process of formation of blastula is called blastulation.

26. What is coeloblastula?

Ans: The blastula which contains a distinct blastocoel is called coeloblastula.

27. What is archenteron?

Ans: The cavity of the gastrula is called archenteron.

28. Which primary germ layer forms the gonads?

Ans: Mesoderm.

29. From which germ layer does brain and spinal cord arise.

Ans: Ectoderm.

**GIVE REASONS FOR THE FOLLOWING:
(ONE MARK EACH)**

30. Gametes are haploid.

Ans: Because they are formed after meiotic division.

31. Human males are heterogametic.

Ans: Because they produce two types of sperms with either X or Y chromosome.

32. Sertoli cells are called nurse cells.

Ans: Because these cells provide nourishment to the developing sperms.

33. Polar bodies are formed during oogenesis.

Ans: Because due to unequal cytokinesis during meiosis.

34. Why do polar bodies disintegrate?

Ans: Because they contain very less amount of cytoplasm.

35. Why Frog's cleavage is called holoblastic unequal?

Ans: Because frog's egg is moderately telolecithal - unequal sized blastomeres are formed during cleavage.

36. Why growth phase in oogenesis is very significant?

Ans: Because during this phase large amount of yolk is synthesized and accumulated.

37. Vitelline membrane is a primary egg membrane.

Ans: Because this membrane is derived from the ovum.

38. Jelly coat of frog's egg is a tertiary egg membrane.

Ans: Because it is derived from the oviduct of the reproductive system of frog.

39. Why does sperm of one species fertilizes the egg of the same species?

Ans: Because the reaction between fertilizin and anti-fertilizin is species specific.

40. The animal pole of frog's egg is dark in colour.

Ans: Because the dark melanin pigments are present in the animal pole.

41. The vegetal hemisphere of the frog's egg is pale in colour.

Ans: Because melanin pigment granules are absent in the vegetal hemisphere.

42. Jelly coat of frog's egg swells up during frog's spawning.

Ans: It is due to absorption of water by imbibition.

43. Blastula of frog is coeloblastula.

Ans: It has a distinct blastocoel towards animal pole.

SHORT ANSWER QUESTIONS

TWO MARKS QUESTIONS.

44. Write distinguishing features between spermatogenesis and oogenesis.

Spermatogenesis	Oogenesis
*Occurs in the testis	Ovary
Each primary spermatocyte results in four functional sperms	Each primary oocyte results in only one functional Ovum
Growth phase short	Prolonged
Equal division during meiosis	Unequal division during meiosis
Polar bodies are not formed	Polar bodies are formed
No vitellogenesis	Vitellogenesis is occurs

45. State any four similarities between spermatogenesis and oogenesis.

- *Both are meant for producing gametes.
- * Both the processes have 3 different stages.
- * In both, mitosis leads to the production of gonial cells.
- * During maturation phase both undergo meiosis to produce haploid gametes.

46. Mention any four difference between Sperm and Ovum.

Sperm	Ovum
Produced in the testis	Ovary
Carries paternal chromosomes	Maternal
Motile	Non motile
Extremely small	Large
No yolk	Yolk is present
Small quantity of cytoplasm	More quantity of cytoplasm
No accessory membrane	Accessory membrane present

47. With references to human sperm, mention the functions of the following.

- a. Acrosome
- b. Nebenkern
- c. Distal centriole
- d. Tail

- Ans: a) Acrosome – dissolves the egg membrane and helps in penetration.
b) Nebenkern – mitochondria provides energy for movement.
c) Distal centriole – produces the axial filament.
d) Tail – movement of sperm.

48. What is acrosome? What is its role in fertilization?

Ans : A cap like structure present at the anterior end of the sperm nucleus is called Acrosome. Acrosome helps in the penetration of sperm into ovum during fertilization.

49. Write any 4 differences between external fertilization and internal fertilization

External fertilization	Internal fertilization
1) It occurs outside the female body	It occurs within the female body
2) Mating is not necessary	Mating is necessary
3) Copulatory organs are not required	Copulatory organs are required
4) Large number of ova are released	Limited no of ova are released
5) It is primitive type	It is advanced type

50. Differentiate between fertilizin and antifertilizin.

- Ans: *Fertilizin (gynogamone) is a chemical substance secreted by ovum. Which is a glycoprotein.
*Antifertilizin (androgamone) is a chemical substance secreted by the sperm which is an acid protein.

51. What is fertilization membrane? How is it formed?

Ans :The thickened vitelline membrane is called fertilization membrane. It is formed due to accumulation of contents of cortical granules below the vitelline membrane.

52. Mention any 4 significance of fertilization.

- Ans: * It restores normal diploid number of chromosomes in the species.
* It brings about recombination of genes of 2 parents.
* It activates the ovum.
* It provides the polarity to the egg.
* It helps in determining the sex of the offspring.
* Fertilization membrane prevents polyspermy.

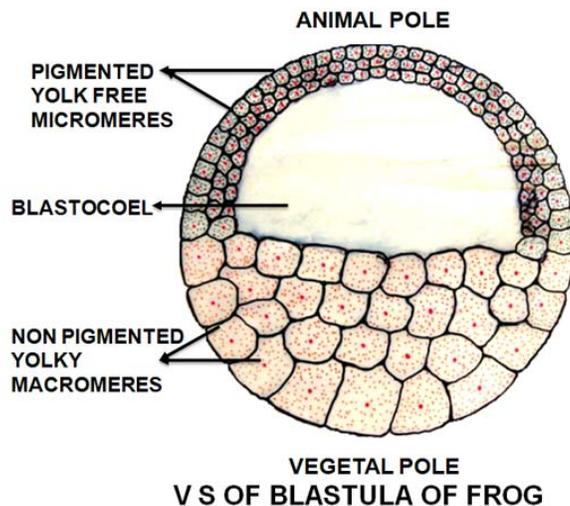
53. Classify frog's egg on the basis of amount and distribution of yolk.

- Ans: * Based on the amount of yolk, egg of frog is called mesolecithal egg.
* Based on the distribution of yolk, it is called moderately telolecithal egg.

54. What is cleavage? What type of cleavage takes place in frog ?

Ans: The process of rapid, successive mitotic divisions of the zygote is called cleavage. The holoblastic and unequal type of cleavage takes place in frog.

55. Draw a neat diagram of V S of blastula of frog and label the parts.



56. What are morphogenetic movements? Mention any three of them with reference to the development of frog.

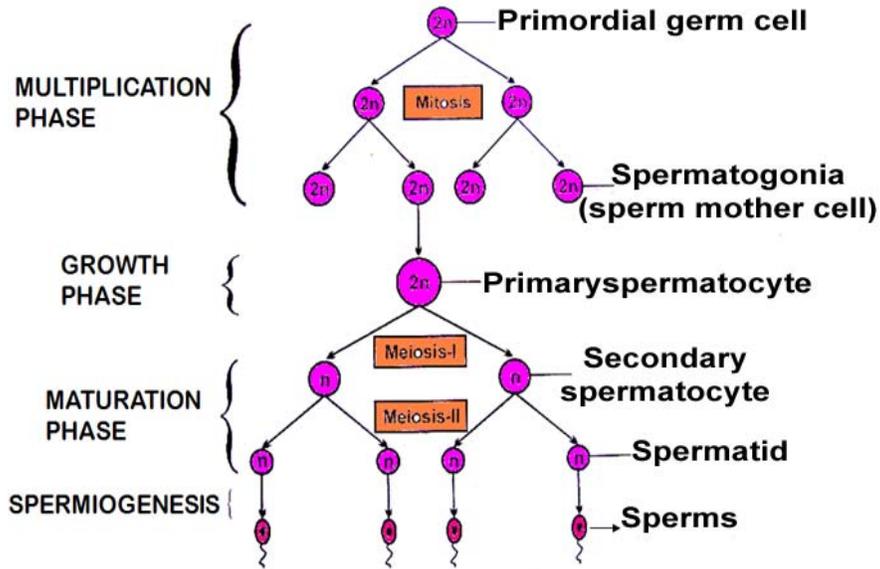
Ans: The regular and dynamic movement of blastomeres during gastrulation is called Morphogenetic movements.

They include

- a) Invagination b) Involution and c) Epiboly.

FIVE MARK QUESTIONS

57. Give the schematic representation of spermatogenesis and explain.



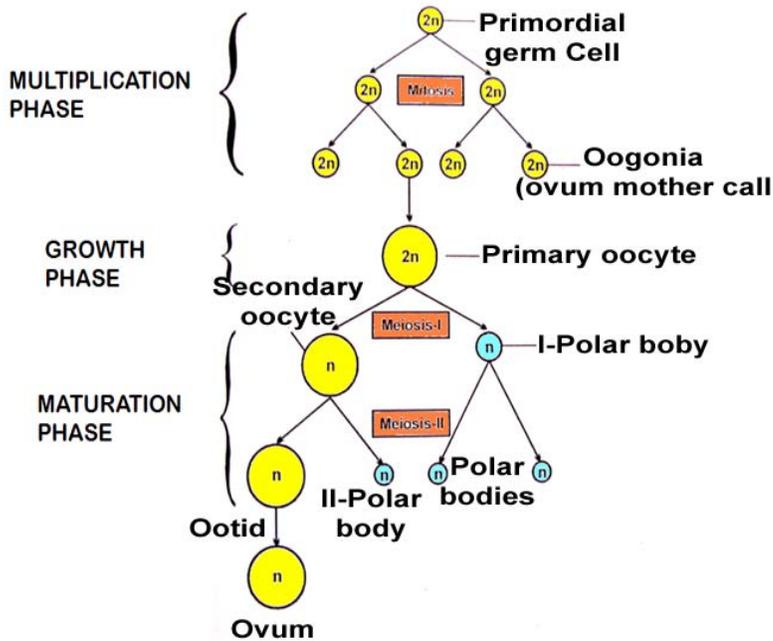
***MULTIPLICATION PHASE**

***GROWTH PHASE**

***MATURATION PHASE**

***SPERMIOGENESIS**

58. Give the schematic representation of oogenesis and explain.

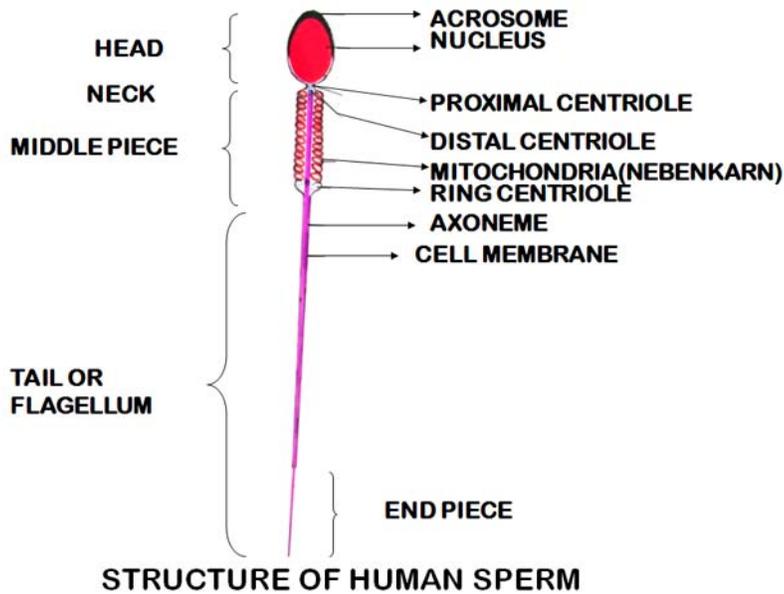


***MULTIPLICATION PHASE**

***GROWTH PHASE**

***MATURATION PHASE**

59. Explain Human sperm with the help of a labelled diagram.



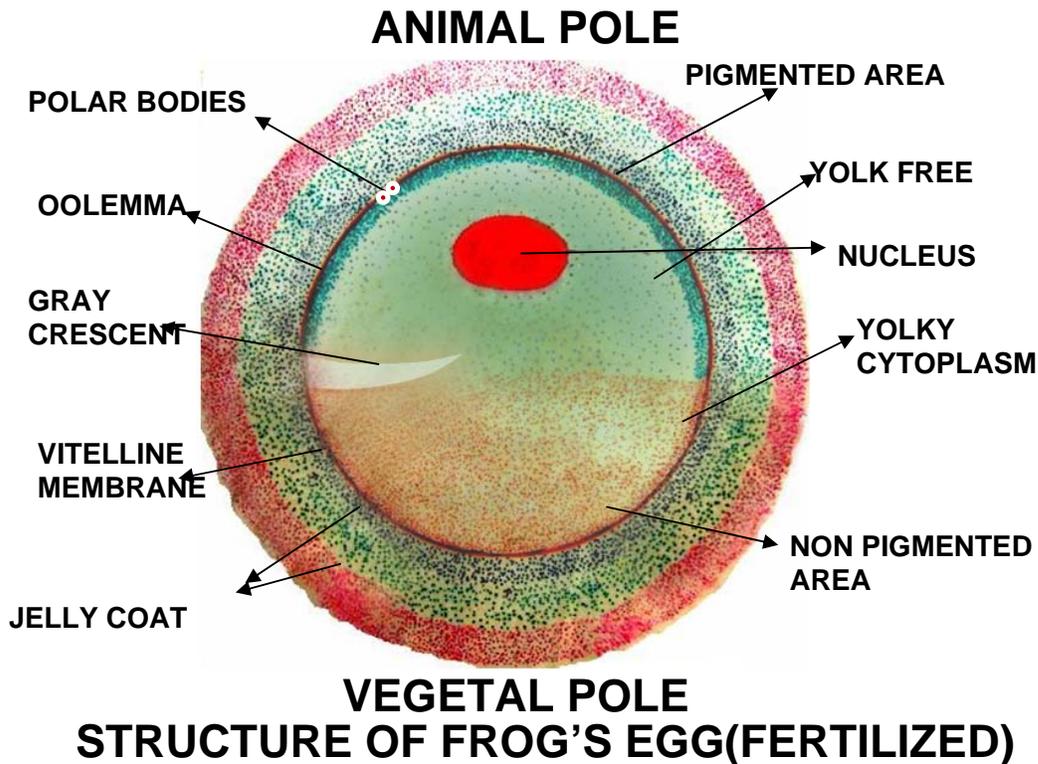
HEAD - ACROSOME, NUCLEUS

NECK - PROXIMAL CENTRIOLE, DISTAL CENTRIOLE

MIDDLE PIECE - MITOCHONDRIA (NEBENKARN), RING CENTRIOLE, AXONEME

TAIL OR FLAGELLUM - CELL MEMBRANE, END PIECE

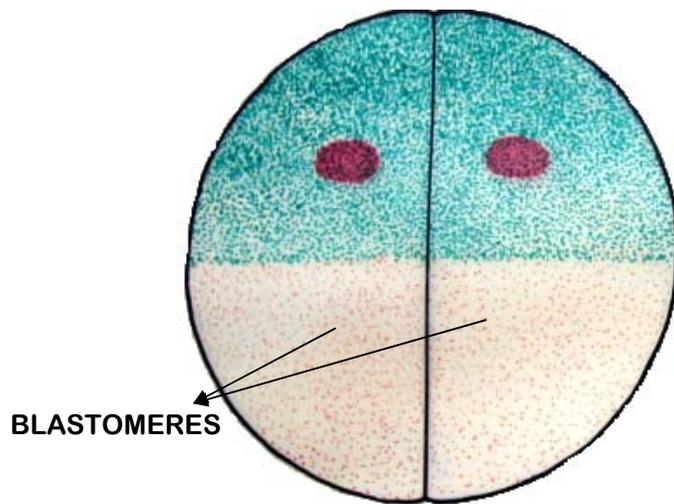
60. Draw a neat labelled diagram of fertilized egg of frog and explain.



- * Mesolecithal egg
- * Moderately telolecithal egg
- * Pigmented area
- * Non pigmented area
- * Animal pole
- * Vegetal pole
- * Grey crescent

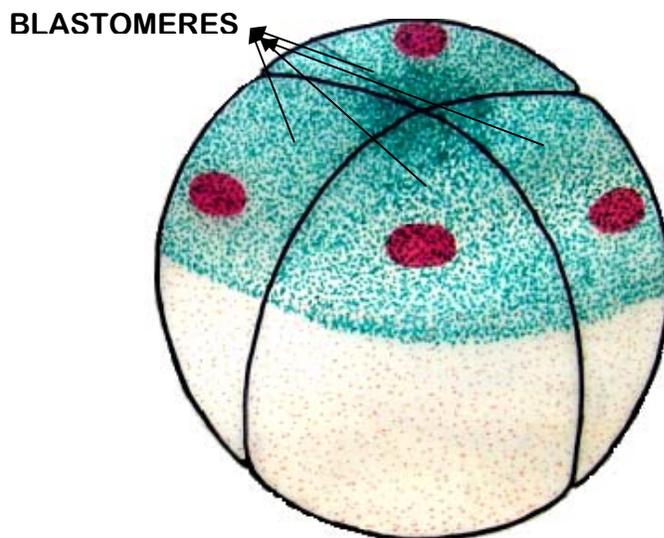
61. Explain cleavage in frogs egg with suitable diagrams.

1ST - CLEAVAGE , 2-CELLS STAGE



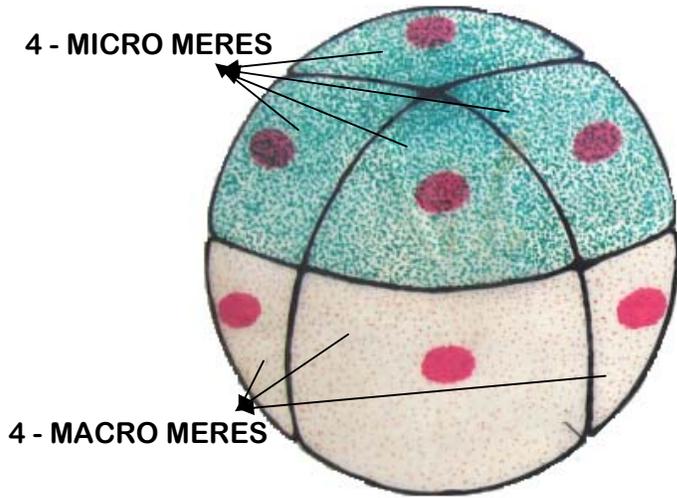
HOLO BLASTIC EQUAL
MERIDIONAL

2ND - CLEAVAGE , 4- CELLS STAGE



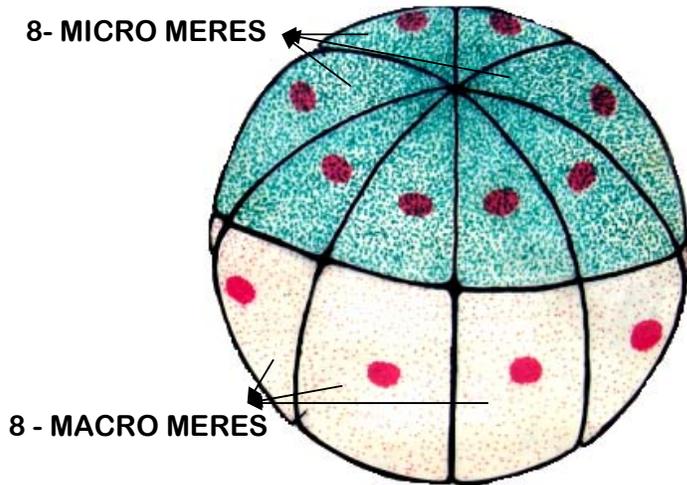
HOLO BLASTIC EQUAL
MERIDIONAL

3RD – CLEAVAGE , 8 - CELLS STAGE



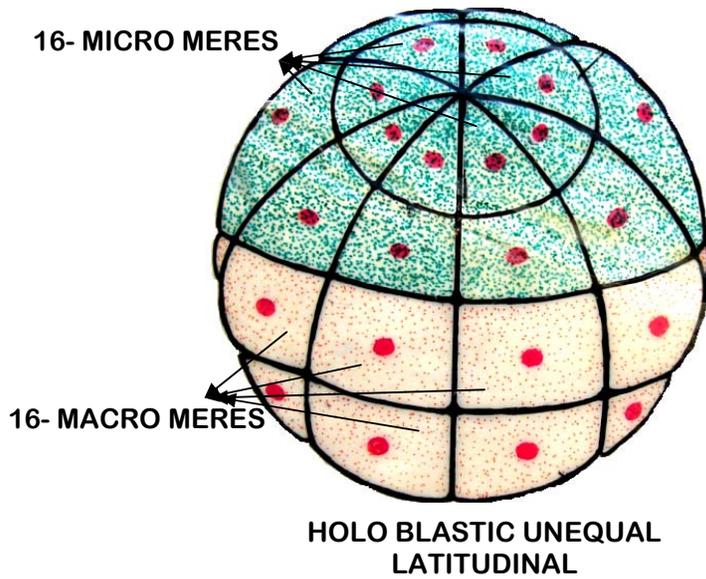
**HOLO BLASTIC UNEQUAL
LATITUDINAL**

4TH – CLEAVAGE , 16 - CELLS STAGE

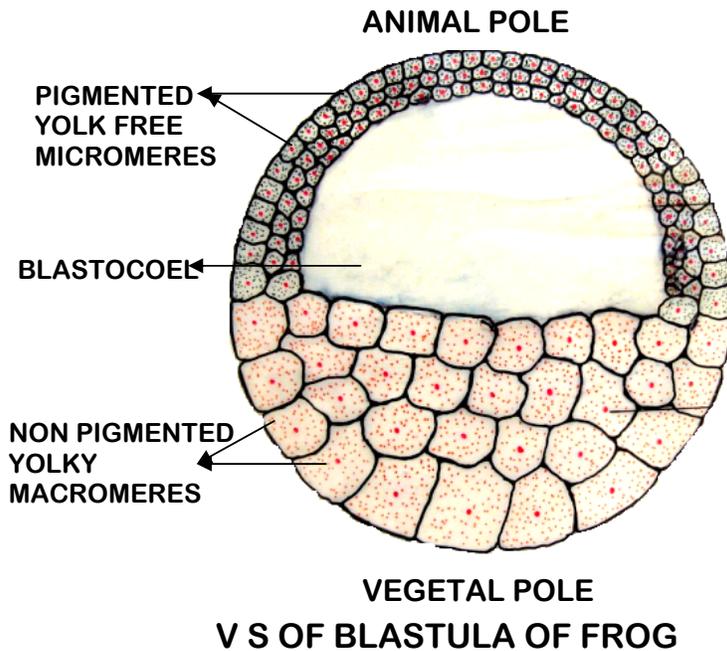


**HOLO BLASTIC UNEQUAL
MERIDIONAL**

5TH – CLEAVAGE , 32 - CELLS STAGE

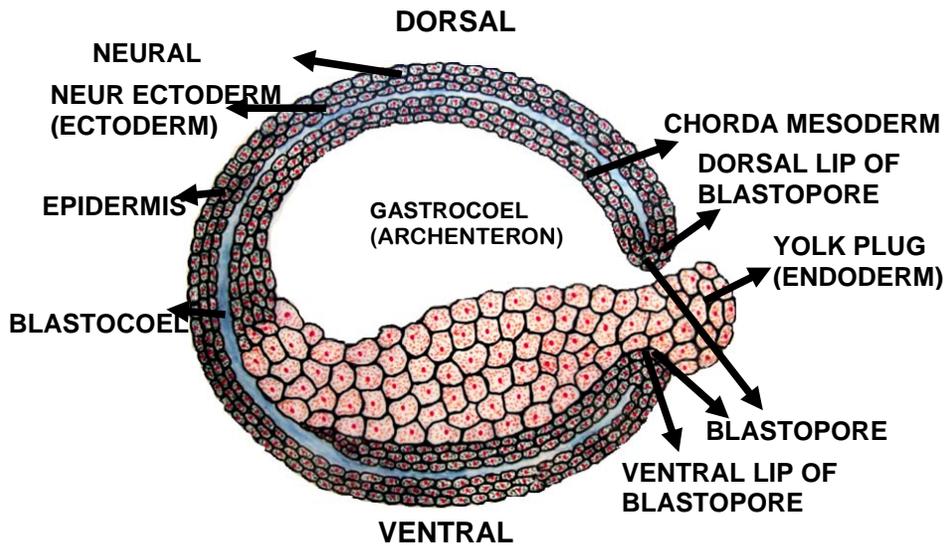


62. Draw a neat labelled diagram of V S of Blastula of frog and explain.



- *PIGMENTED YOLK FREE MICROMERES – ANIMAL POLE
- *NON PIGMENTED YOLKY MACROMERES – VEGETAL POLE
- *ACENTRIC BLASTOCOEL
- *COELO BLASTULA

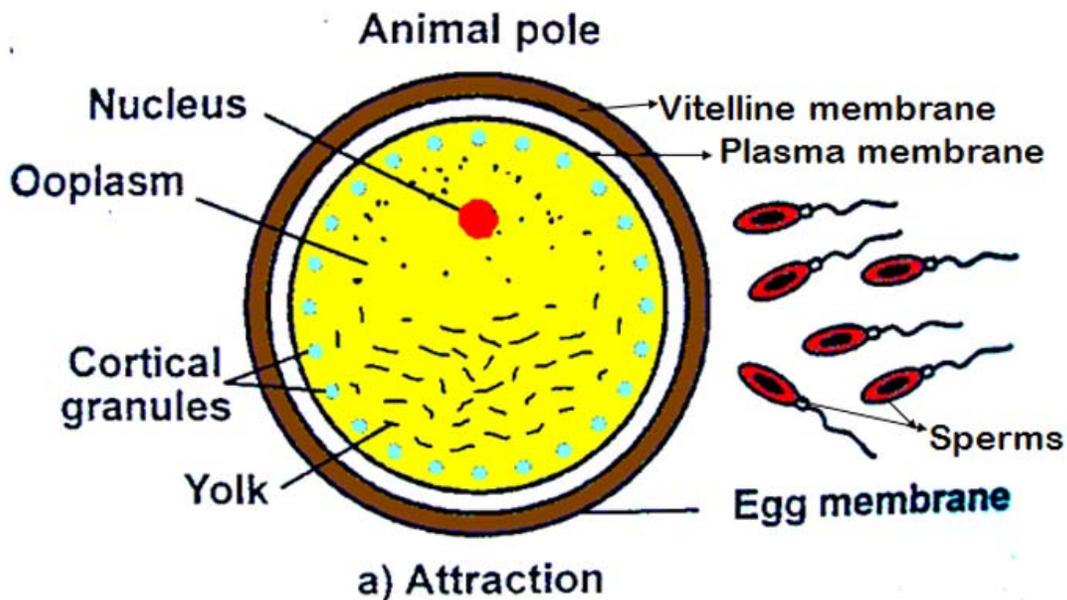
63. Draw a neat labelled diagram of V S of Gastrula of frog and explain.

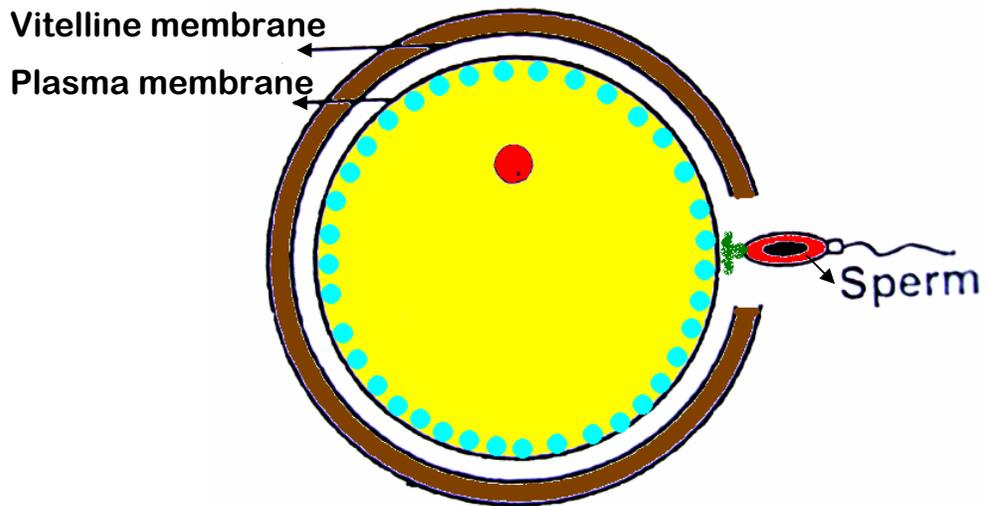


V S OF GASTRULA OF FROG (YOLK PLUG STAGE)

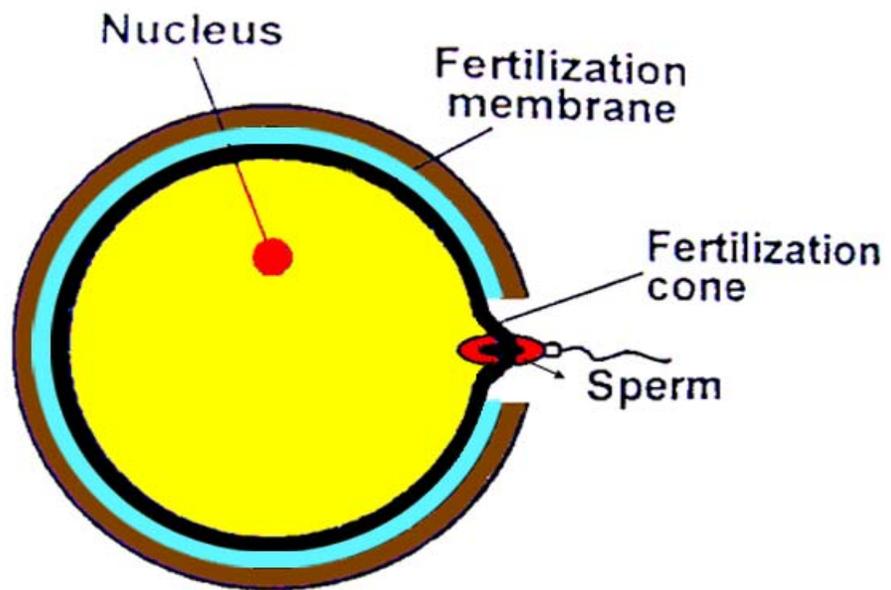
- *NEUR ECTODERM (ECTODERM)
- *CHORDA MESODERM
- *YOLK PLUG (ENDODERM)
- *GASTROCOEL (ARCHENTERON)
- *BLASTOPORE

64. With the help of labeled sketches describe the process of fertilization.

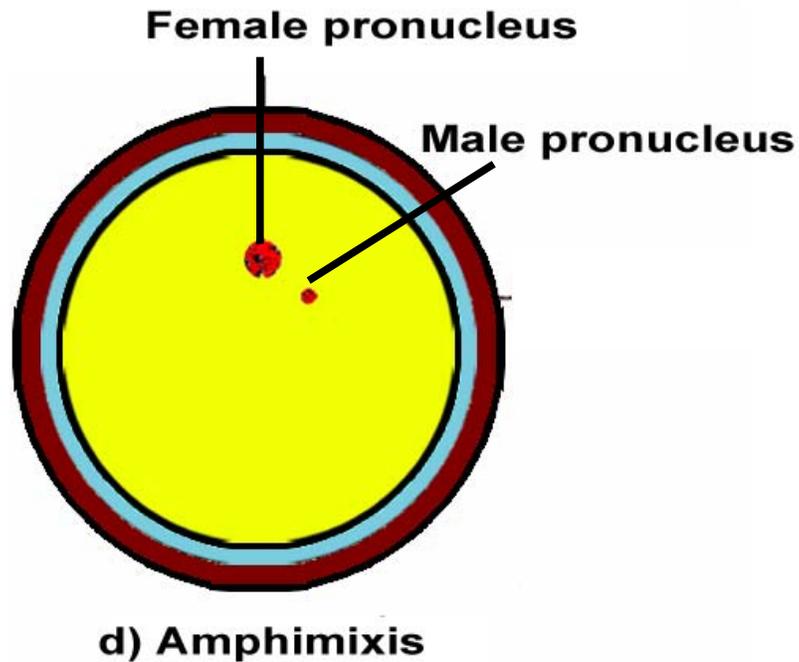




b) Penetration



c) Activation



- *Attraction – Chemotaxis, Fertilizin, anti fertilizin
- * Penetration - Acrosomal reaction, Hydrolytic enzymes
- * Activation - Cortical changes, formation of fertilization cone, formation of fertilization membrane
- *Amphimixis - Union of male pronucleus(n) with female pronucleus(n)
- formation of zygote nucleus(2n), formation of zygote

HUMAN REPRODUCTION

ONE MARK QUESTIONS

65. Name the non-reproductive cell found in the germinal epithelium of male gonad.

Ans: Sertoli cells

66. What is an antrum ?

Ans: Antrum is the cavity found in the Graafian follicle.

67. Mention the site of fertilization in human.

Ans: Fertilization occurs in the upper part of fallopian tube.

68. What is ovulation ?

Ans: The release of ovum (egg) from the ovary is called ovulation.

69. Define implantation.

Ans: Process of attachment of the blastocyst to the endometrium of the uterus.

70. Name the physiological connection between the mother and fetus.

Ans: Placenta.

71. What is Allantochoionic placenta?

Ans: The placenta formed by the fusion of chorion and allantois is called Allantochoionic placenta.

72. What is endometrium?

Ans: The inner lining layer of the uterus is called endometrium.

73. What is pregnancy (gestation)?

Ans: The period of development between fertilization and birth is called pregnancy.

74. What is duration of gestation in humans?

Ans: Approximately 280 days after fertilization.

75. Name the hormone responsible for the secondary sexual characters in males

Ans: Testosterone or Androgen.

76. Name the organ which secretes human chorionic gonadotropin(hCG).

Ans: Placenta.

77. Name the cells which secrete testosterone.

Ans: Interstitial cells (cells of Leydig)

78. Which is the pregnancy hormone?

Ans: Progesterone is the pregnancy hormone.

79. What is contraception ?

Ans: Prevention of conception / prevention of pregnancy.

80. What is azoospermia?

Ans: Absence of sperms in the semen is called azoospermia.

81. Name the causative agent (bacteria) of syphilis.

Ans: *Treponema pallidum* causes syphilis.

82. Name the virus which causes AIDS.

Ans: Human Immunodeficiency virus(HIV).

(Note: HIV is a RNA virus)

83. Expand STD

Sexually Transmitted Disease

84. Expand ZIFT

Zygote Intra Fallopian Transfer.

85. Expand GIFT

Gamete Intra Fallopian Transfer.

**GIVE REASONS FOR THE FOLLOWING:
(ONE MARK EACH)**

86. Human egg is alecithal.

Ans: Because yolk is absent.

87. Human fetus is a parasite on the mother.

Ans: Because it depends on the mother for its nourishment.

88. The progesterone is called pregnancy hormone.

Ans: Because it maintains pregnancy and prevents spontaneous abortion.

89. Menstruation is generally not seen during pregnancy.

Ans: Because progesterone and estrogen hormones prevents menstrual cycle during pregnancy.

90. Why is contraception necessary?

Ans: Contraception is necessary to check population growth.

SHORT ANSWER QUESTIONS

TWO MARKS QUESTIONS.

91. Mention four functions of placenta

Ans: i) Transport of O₂ and nutrients
ii) Transport of CO₂ and nitrogenous wastes
iii) Secretes hormones
iv) Stores lipids and glycogen
v) Stores Ca and Fe (mineral salts)
vi) Anchorage of embryo to the uterus
vii) Natural immunity
viii) Physical barrier.

92. Mention the phases of menstrual cycle.

Ans: The menstrual cycle has 4 phases namely,

- a) Menstrual phase,
- b) Pre-ovulatory phase,
- c) Ovulatory phase and
- d) Post-Ovulatory phase.

93. Mention two ovarian hormones.

Ans: i) Estrogens
ii) Progesterone

94. What is IUD? Give an example.

Ans: An IUD is a flexible small birth control device made up of plastic, copper or stainless steel.

Ex: Copper –T, loops.

95. List four common causes for infertility among males

Ans: i) Obstruction of reproductive ducts
ii) Infection of testis
iii) Alcoholism
iv) Undeveloped testis
v) Oligospermia
vi) Azoospermia

96. What is Gonorrhoea ? Name the causative organism

Ans : Gonorrhoea is a sexually transmitted disease.

Causative organism – *Neisseria gonorrhoeae*.

97. Mention any four preventive measures to control AIDS

- Ans:
- i) Avoiding sex with multiple partners
 - ii) Use of condoms during sexual intercourse
 - iii) Avoid homosexuality
 - iv) Use of disposable syringe or sterilized needles
 - v) Avoid sharing personal items like razors, shaving blades, etc.

98. Name two sexually, transmitted diseases.

- Ans:
- i) Gonorrhoea and
 - ii) Syphilis.

99. Write any four symptoms of AIDS.

- Ans:
- i) Sudden loss of weight.
 - ii) Prolonged fever.
 - iii) Recurrent diarrhea.
 - iv) Persistent dry cough.
 - v) Swelling of lymph nodes
 - vi) Loss of appetite.

FIVE MARK QUESTION

100. What is AIDS? Write the mode of its infection and preventive measures.

Ans : AIDS is a sexually transmitted viral disease which destroy the immune system of the body.

It is caused by HIV

Mode of infection :

- 1) Sexual contact with infected person.
- 2) Transfusion of HIV+ve blood.
- 3) Using Unsterilized needles and syringes.
- 4) Intravenous drug abuse.
- 5) From an infected mother to her baby.

Preventive measures:

1. Avoiding multiple sex partner.
2. Not using HIV+ve blood for transfusion.
3. Using sterilized needles and syringes.
4. Avoiding drug abuse.
5. Advising infected woman against pregnancy.
