

Development of Embryo (Embryogeny or Embryogenesis)

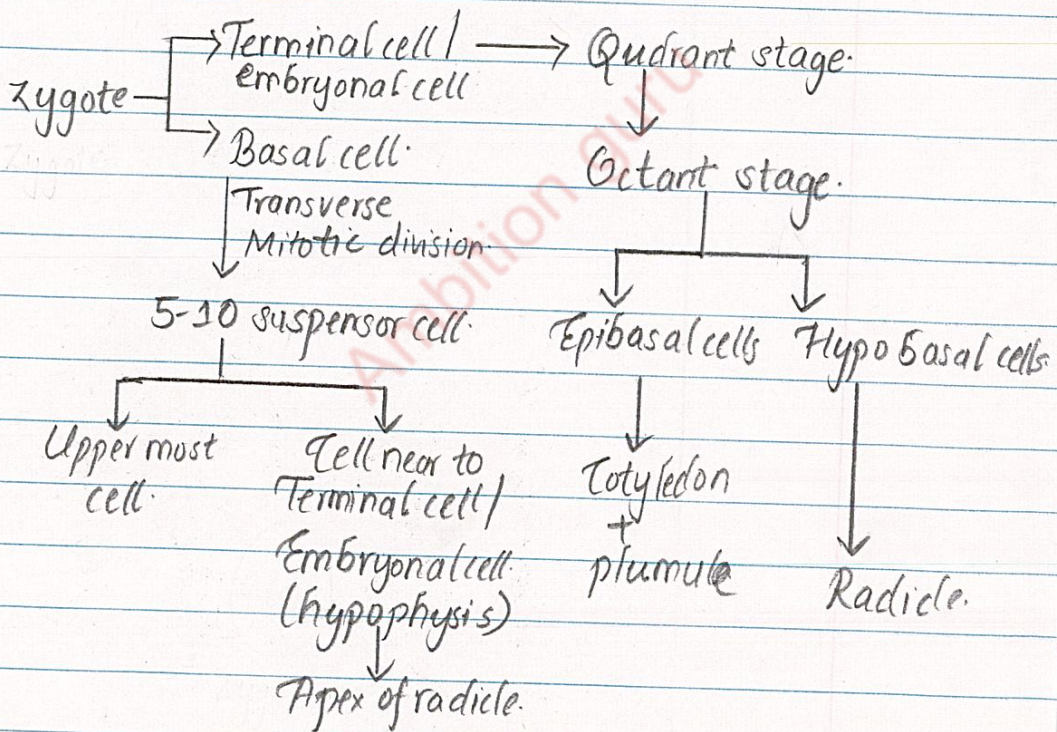
1. Write the salient features of a dicot embryo in reference to its development pattern with suitable diagrams.
(2080) (3+1=4 marks)

-Development of Dicot Embryo:

- Diploid zygote divides and re-divides and embryo forms.
- First division of egg (zygote) is transverse and 2 cell formed.
- Out of them cell lies towards interior of embryo sac called terminal cell and other basal (suspensor cell).

- Terminal cell divide vertically where suspensor divide by several transverse division forming 5-10 suspensor.
- Last cell of suspensor swell to form vesicular cell or haustorial cell.
- Suspensor pushes the developing embryo into endosperm.
- Suspensor cell near to embryo : Hypophysis.
- This cell give rise to apex of radicle.
- 2-cells formed by terminal cell divide by transverse division form 4 embryonal cells (~~octar~~ Quadrant / Octant stage)
- 4-cell divide by another vertical

forming 8-cells (Octant stage)
 - 4 cells at apex give rise to plumule and cotyledon whereas other 4-cells give rise to hypo-cotyl and most radicle.



Development of Dicot Embryo

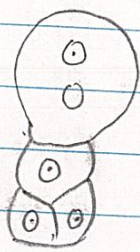
Basal cell



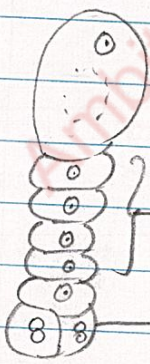
Zygote
A



Embryo
B



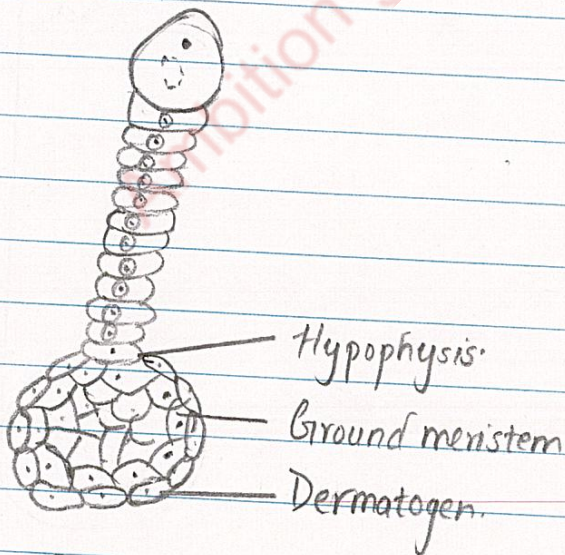
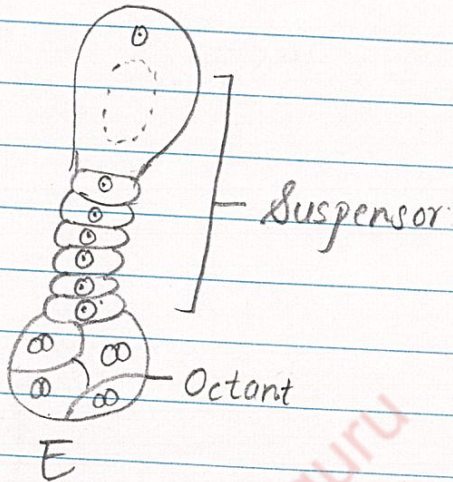
1-shaped
proembryo
C



Suspensor

Quadrant

D.



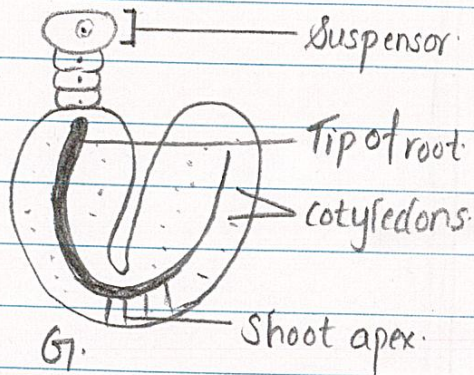


Fig: Different stages in development of dicot embryo.

2. Development of monocot embryo. (4 marks) (2016)

- Zygote or oospore elongates and then divides transversely to form basal and terminal cells.
- Basal cell (towards micropylar

end) produces a large swollen, vesicular suspensor cell.

- Terminal cell divides by another transverse wall to form two cells. (i.e. middle cell and terminal cell).

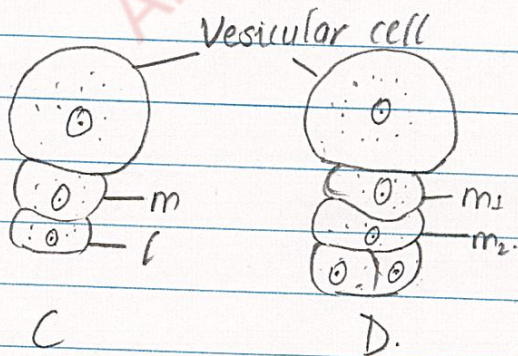
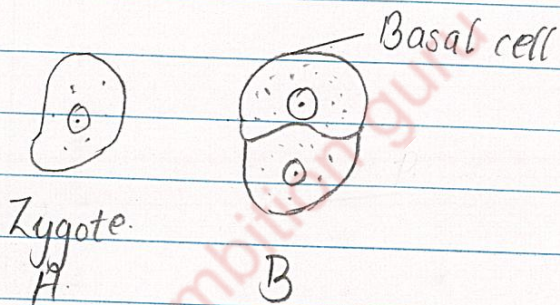
- Form 3-celled proembryo.

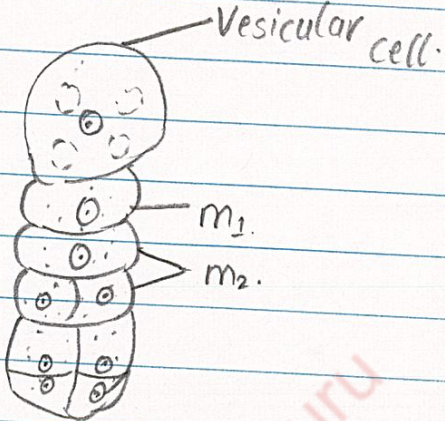
- Top cell after a series of divisions forms plumule and a single cotyledon called scutellum.

- Middle cell divides transversely into 2 cells (m_1 and m_2).

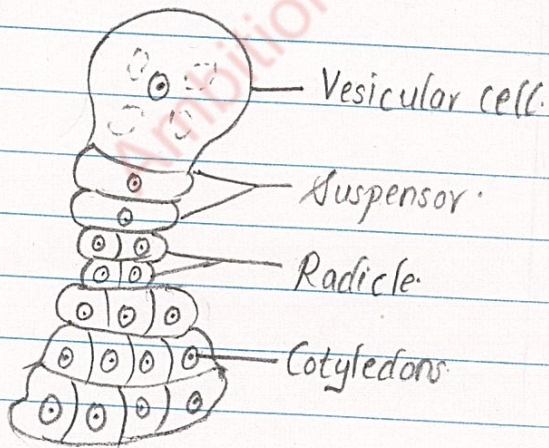
- Cell next to quadrants (m_2) also divides vertically and then transversely and later form plumule or stem tip as well as radicle of embryo.

- Cell next to the upper vesicular cell (m_2) divides several times transversely and later form 3-6 cells suspensor.

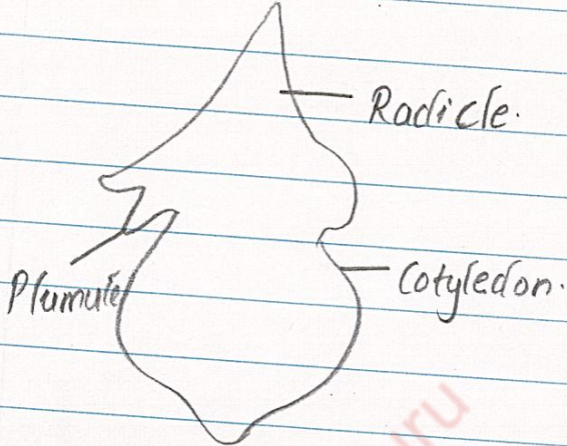




E.



F.

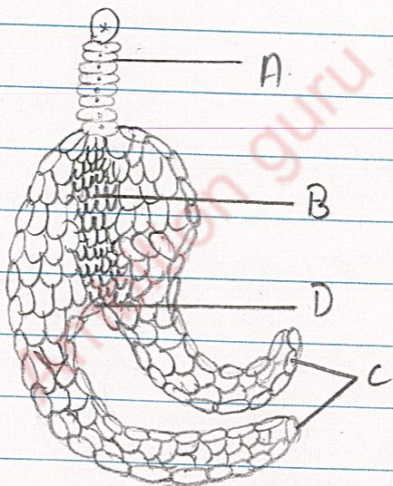


G

Fig: Development of monocot embryo.

3. Study the given figure carefully and answer the following questions. (4 marks)
(2080)

- a. Identify the given figure.
- b. Name the parts A, B, C and D.
- c. State the function of part D.



a

→ Given figure shows dicot
embryo.

b

→ A - Suspensor.

B - Radicle.

C - Cotyledons.

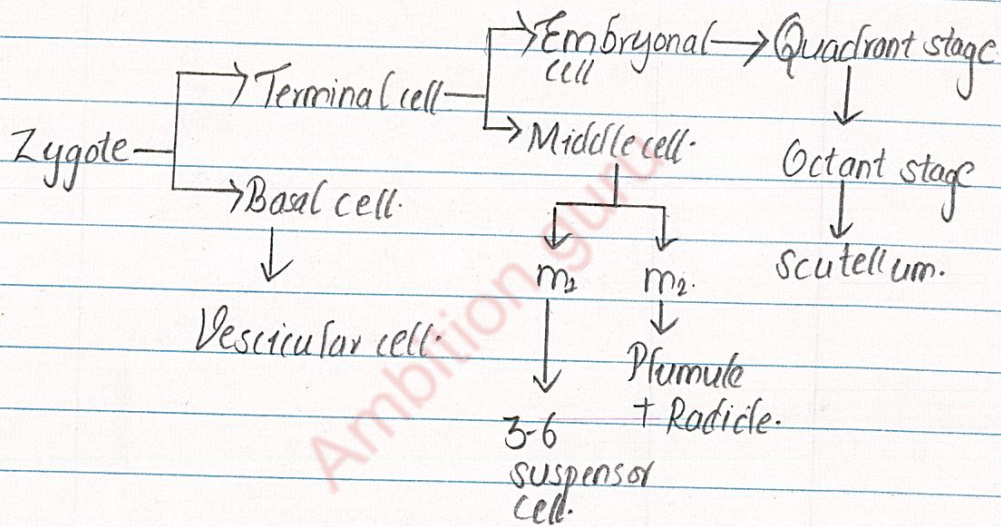
D - Plumule

c

→ Function of part D:

- Helps in the formation of first shoot which later forms the shoot system consisting of stem, leaves, buds, etc. of dicot plant.

Note:



Development of Monocot embryo.