ANSWERS TO TEXTBOOK QUESTIONS

Objective Questions

A. Multiple choice questions.

1. a	**2.** d	**3.** c	**4.** c	**5.** b
6. b	**7.** a	**8.** a	**9.** a	**10.** d
11. c	**12.** d	**13.** d		

B. State whether 'true' or 'false'.

1. False	**2.** True	**3.** False	**4.** True	**5.** False
6. False	**7.** False	**8.** True	**9.** True	**10.** False
11. True	**12.** True	**13.** True	**14.** True	**15.** False

C. Give one word answers.

1. Reproduction	**2.** Oviparous	**3.** viviparous	**4.** Metamorphosis	**5.** Testis
6. Ovaries	**7.** Oviduct	**8.** Uterus	**9.** Foetus	
10. Fallopian tube		**11.** Sperm	**12.** Ovum	**13.** Fertilization
14. Zygote	**15.** Amoeba	**16.** Hydra	**17.** Fish/Frog	**18.** Man
19. Uterus				

Theoretical Questions

A. Short answer type questions.

1. Reproduction is the processes which help multiplication of organisms.

2. The process of fertilization of egg taking place outside the body of an organism is called external fertilization. Female frog lays eggs in water. The eggs are in a group in a jelly like substance. The jelly with eggs is called spawn. Male frog lays sperms in water around spawn. Sperms swim to the spawn and one sperm fertilizes one egg only. Thus fertilization in frog is external.

3. Post fertilization embryo develops inside the body of the mother of viviparous animals, whereas it takes place outside the body in the egg from hen.

4. Male frog is smaller and dark as compared to the female frog .

5. Asexual reproduction is a fast process of multiplication in comparison to sexual reproduction. There is no involvement of male and female (two parents) and male and female gamete. One organism can produce off springs by itself.

6. Cow and hen are two animals. In cow fertilization and development of the baby is internal (in the body of the mother). In hen fertilization is internal but development of the baby from the egg is external.

B. Long answer type questions.

1. The sperm forming activity in testes is more efficient at a temperature below the body temperature and hence the scrotal sacs remain hanging in air to keep them cool at a temperature below the temperature of the body.

Sperms are stored in the coiled tubes in epididymis for a long period of time where they either mature into sperms or degenerate or reabsorbed by the walls of the epididymis.

Sperms travel through sperm ducts from each testis to join the tube coming from urinary bladder to urethra.

Sperms from epididymis passing through sperm ducts are stored in seminal vesicles where they mature and are placed in viscous fluid. Fluid formation is also helped by Prostate glands and Cowper's glands. The sperms lying in viscous liquid is called semen.

The semen carrying sperms passes through the urethra tube in the penis to exit. Mature sperm is a male gamete with a head, body and a long tail. The head is a single cell bearing a nucleus and is the actual sperm.

2. Fusion of male gamete (sperm) with female gamete (egg) is called fertilization. During fertilization the nucleus from the sperm fuses with the nucleus from the egg forming a single zygotic nucleus in a cell. Gametes carry genes from each parent and thus fertilization results in the combination of characters from two parents.
3. In insects development of egg to a young one takes place through four stages and in frog there are three prominent stages. Female frog lays eggs in a spawn in water where they are fertilized by sperms laid by male frog. Fertilization in frog is external and further development of fertilized egg (zygote) to an adult frog is in water (external). Zygote from frog develops into embryo (a group of cells) which then develops into a tadpole (Which is like a fish with gills and a tail). Tadpole swims in water and gradually metamorphoses to lose its tail and gills being replaced with lungs, develops limbs to become an adult frog.
4. Fertilization takes place while the egg or the ovum is passing through the oviduct and immediately thereafter the zygote starts dividing forming a group of cells in a ball shape(baby embryo). The ball like embryo enters the uterus (the womb) where it gets attached to the soft spongy cushion (endometrium) formed along the walls of the uterus. This is called implantation. Gradually, the embryo develops a link with the blood supply from the mother through a duct called umbilical cord. The point of attachment of the cord with the wall of the uterus is called placenta. The embryo starts drawing its nutrition in the form of blood from the mother through umbilical cord. When the embryo gets implanted in the womb the mother is said to have 'conceived' and is pregnant.
5. Hydra reproduces asexually by Budding. Hydra is a multicellular aquatic organism with a soft cylindrical body. It bears tentacles surrounding its mouth which is towards the top of the body. Generally, Hydra remains attached to the leaves or stems of other aquatic plants or to a base (may be a rock) under water. For the purpose of reproduction by budding, one or more buds bulge out from the lateral sides of Hydra, each bud forming a baby hydra. Baby Hydra finally separates out from the body of the parent forming an independent Hydra. Hydra multiplies rapidly by producing many Hydra buds.
6. Asexual reproduction in Amoeba is by the process of Binary Fission. You may be remembering that bacterium also multiplies by binary fission. Amoeba, the unicellular organism multiplies by simple division of one cell into two. This division of a cell to form two new cells is called binary fission (fission means splitting apart or division into two parts). Binary fission in Amoeba begins with the splitting of the nucleus into two nuclei followed by division of the body of the cell into two by constriction, each part receiving a nucleus. Each part of the cell with a single nucleus separates out into an independent Amoeba. Thus, two daughter amoebae are formed.
7. The process of cloning:
   - **i.** The clone from the sheep to be obtained was 'Finn Dorset sheep'.
   - **ii.** A normal body cell from the mammary gland of the white faced ewe 'Finn Dorset'was taken out. (Ewe is the female sheep).
   - **iii.** An egg or ovum was taken out from the ovary of the Scottish black faced ewe.
   - **iv.** The nucleus from the egg cell obtained from black faced ewe was removed and replaced with the nucleus from the cell obtained from Finn Dorset sheep.
   - **v.** The 'new cell' with the nucleus from the mammary gland of white faced ewe was implanted in the uterus of the Scottish blackface ewe as zygote (without fertilization), which developed into the clone 'Dolly".

     Advantage of cloning is in obtaining a true copy of the parent (of desired superior quality) from whom the mother nucleus is being obtained. There is no mixing of characters as happens in the case of fertilization of two gametes coming from two parents. Disadvantage of cloning is that the survival rate of clones is poor. Most of the clones die during development or soon after birth and some clones have been found to be with certain abnormalities.

8. Some women fail to conceive and get pregnant in a normal way. This may be due to some blockade in the oviducts (fallopian tubes) so that (i) the egg or the ovum from ovary fails to enter the oviduct, or (ii) sperms fail to reach the egg and unite with it, or (iii) due to insufficient number of sperms in the semen from man. In such cases a process called 'In Vitro Fertilization' (IVF) is adopted. In the process:

i. The Doctor makes a micro cut on the side of the woman's abdomen and inserts an optical fibre tube to reach the ovary for locating an egg. On finding the egg, the egg is sucked out and placed in a dish or test-tube in a suitable medium (solution) to keep the egg active.

ii. The sperms from male are obtained and transferred immediately to the dish or the test-tube with the egg in it.

iii. Fertilization of the egg takes place in the dish and it may start growing into an embryo. The fertilized egg (now an embryo) is then implanted in the women's womb (uterus).

iv. The embryo may get seeded in the uterus and starts developing further.

v. In case the attempt fails another attempt is made till success.

Babies born through this technique are called "Test-tube babies" though baby actually develops within mother's womb. It is only the process of fertilization which takes place in a test tube or a glass dish outside the body of the mother.