



Chapter-10

Reaching the Age of Adolescence

SOLUTIONS:

Exercises

1. What is the term used for the chemical secretions of endocrine glands responsible for changes taking place in the body?

Ans: Hormone.

2. Define adolescence.

Ans: The period of life when the body undergoes changes, leading to reproductive maturity, is called adolescence. Adolescence begins around the age of 11 and lasts upto 18 or 19 years of age.

3. What is menstruation? Explain.

Ans: Menstruation is the process of shedding of the uterine lining of the body. With the onset of puberty, the ova (eggs) begin to mature and one matured ovum is released by one of the ovaries once in about 28 to 30 days. During this period, the wall of the uterus becomes thick and supplied with blood vessels so as to receive the fertilized egg. If the egg is left unfertilised, then the lining of the uterus breaks down and get released in the form of blood. This occurs once in about 28 to 30 days.

4. List changes in the body that take place at puberty.

Ans: The following are the changes in the body that take place at puberty:-

- (i) Sudden increase in height due to elongation of long bones, i.e., the bones of arms and the legs.
- (ii) Change in the body shape. In boys shoulders become broader and wider. In girls the region below the waist becomes wider.
- (iii) Change in voice .Boys develop larger voice box and can be seen as a protruding part of the throat called Adam's apple. In boys voice becomes deep and hoarse and in girls it is high pitched.
- (iv) Pimples and acne appear on face due to increased secretion of sweat and sebaceous (oil) glands.
- (v) Reproductive organs begin to mature. In males testes and penis develop completely and begin to produce sperms. In females the ovaries enlarge and begin to mature. Ovaries start releasing mature eggs.
- (vi) Development of secondary sexual characters. In boys facial hair, i.e., beard and moustache and hair on chest begin to grow. In girls, breast

begins to develop. In both, boys and girls, hair begins to grow under the arms and in the pubic region.

5. Prepare a Table having two columns depicting names of endocrine glands and hormones secreted by them.

Ans:

Sl.No.	Endocrine Gland	Hormone Secreted
1	Testes	Testosterone
2	Ovaries	Estrogen
3	Pituitary	Growth hormones
4	Thyroid	Thyroxine
5	Adrenal	Adrenalin
6	Pancreas	Insulin

6. What are sex hormones? Why are they named so? State their function.

Ans: The chemical substances secreted by sex organs are called sex hormones. They are testosterone and estrogen secreted by testes and ovaries respectively.

These hormones are called sex hormones because they are secreted by sex organs and are responsible for the development of secondary sexual characters.

Their functions are as follows:-

- (a) Testosterone. This hormone is responsible for the development of secondary sexual characters in boys like growth of beard and moustaches, growth of hair on the chest, under the arm and in the pubic region.
- (b) Estrogen. This hormone is responsible for the development of secondary sexual characters in girls like development of breasts, development of mammary glands inside the breast, growth of hair under the arms and in the pubic region.

7. Choose the correct option.

- (a) Adolescents should be careful about what they eat, because
 - (i) proper diet develops their brains.
 - (ii) proper diet is needed for the rapid growth taking place in their body.
 - (iii) adolescents feel hungry all the time.
 - (iv) taste buds are well developed in teenagers.
- (b) Reproductive age in women starts when their
 - (i) menstruation starts.
 - (ii) breasts start developing
 - (iii) body weight increases.
 - (iv) height increases.

- (c) The right meal for adolescents consists of
- (i) chips, noodles, coke.
 - (ii) chapatti, dal, vegetables.
 - (iii) rice, noodles and burger.
 - (iv) vegetable cutlets, chips and lemon drink.

Ans: (a) – (ii) proper diet is needed for the rapid growth taking place in their body.
(b) – (i) menstruation starts.
(c) - (ii) chapatti, dal, vegetables.

8. Write notes on-

- (a) Adam's apple.
- (b) Secondary sexual characters.
- (c) Sex determination in the unborn baby.

Ans: (a) Adam's apple

At puberty, the voice box or larynx begins to grow. In boys the growing voice box can be seen as a protruding part of the throat and is known as Adam's apple. Sometimes the muscles of the growing voice box in boys go out of control and makes the voice hoarse.

(b) Secondary sexual characters.

Secondary sexual characters are those features that begin to develop at puberty and distinguish the male from the female. Sex hormones, testosterone and estrogen are responsible for the development of secondary sexual characters in male and female respectively. Some of the secondary sexual characters of males are development of beard and moustache, growth of hair on chest, under the arms and in the pubic region, etc. And some of the secondary sexual characters of females are development of breasts, development of mammary gland inside the breasts, growth of hair under the arms and in the pubic region, etc.

(c) Sex determination in the unborn baby.

All humans have 23 pairs of chromosomes in the nuclei of their cells. Two chromosomes out of these are called the sex chromosomes, named X and Y. A female has two X chromosomes, while a male has one X and one Y chromosome. The gametes, i.e., egg and sperm have only one set of chromosome. The unfertilized egg always has one X chromosome. But sperms are of two kinds. One kind has X chromosome and the other kind has a Y chromosome. When a sperm containing X chromosome fertilises the egg, the zygote would have two X chromosomes and develops into a female child. If the sperm containing Y chromosome fertilises the egg, the zygote would have X and Y chromosomes and develops into a male child.

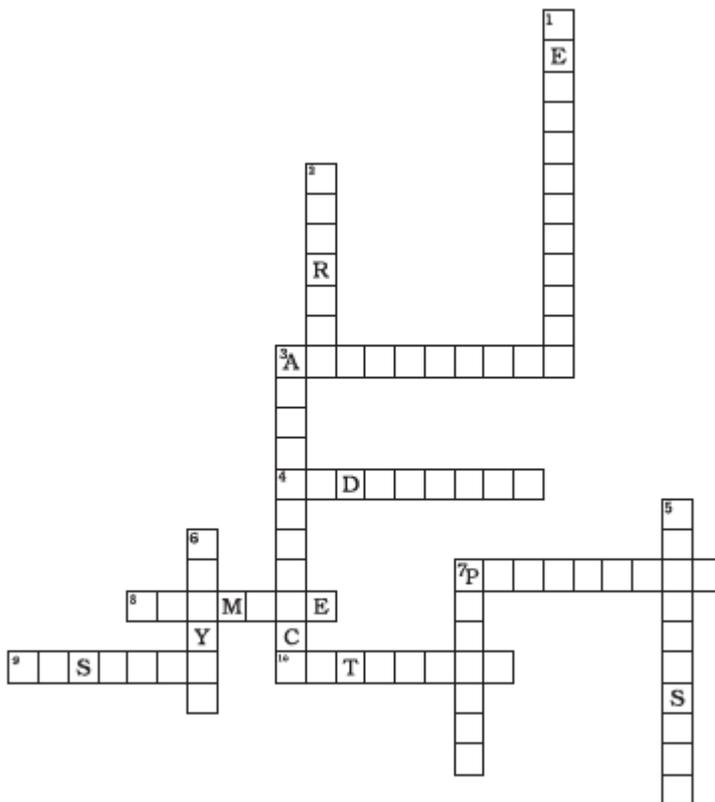
9. Word game: use the clues to work out the words.

Across

3. Protruding voice box in boys
4. Glands without ducts
7. Endocrine gland attached to brain
8. Secretions of endocrine glands
9. Pancreatic hormones
10. Female hormone

Down

1. Male hormone
2. Secretes thyroxine
3. Another term for teenage
5. Hormone reaches here through blood stream
6. Voice box
7. Term for changes at adolescence



Ans: Across

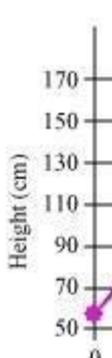
3. Adam's apple
4. Endocrine
7. Pituitary
8. Hormone
9. Insulin

10. Estrogen

Down

1. Testosterone
2. Thyroid
3. Adolescence
5. Target site
6. Larynx
7. Puberty

10. The table below shows the data on likely heights of boys and girls as they grow in age. Draw graphs showing heights of boys and girls on the same graph paper. What conclusions can be drawn from these graphs?



Age (Years)	Height (cm)	
	Boys	Girls
0	53	53
4	96	92
8	114	110
12	129	133
16	150	150
20	173	165

Ans: From this graph we can conclude that boys grow faster initially, i.e., at 0-8 years of age. But at the age of 8-16 years girls grow faster than boys. At the age of 20 years both boys and girls have attained their maximum heights. The graph also shows greater increase of the boys' height than the girls'.



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Extra Questions and Answers

1. Match the endocrine gland in Column A with its secretion in Column B.

A	B
(i) Testes	(a) Thyroxine
(ii) Pituitary	(b) Insulin
(iii) Pancreas	(c) Adrenalin
(iv) Thyroid	(d) Growth hormones
	(e) Testosterone

Ans: (i) Testes – (e) Testosterone
(ii) Pituitary – (d) Growth hormones
(iii) Pancreas – (b) Insulin
(iv) Thyroid – (a) Thyroxine

2. What is the other name of ductless glands?

Ans: Endocrine glands.

3. Define puberty.

Ans: Puberty is the process of several changes taking place in the body during adolescence leading to reproductive maturity.

4. What is the relation between adolescence and puberty?

Ans: Adolescence is the period of life, when the body undergoes several changes, leading to reproductive maturity. These changes marked the onset of puberty.

5. What are endocrine glands? Give examples.

Ans: Endocrine glands are ductless glands that secrete chemical substances called hormones into the bloodstream. E.g., pituitary gland, adrenal gland, testes, ovaries, etc.

6. Name the hormone secreted by pancreas. What is the disease caused by insufficient production of its hormone?

Ans: The hormone secreted by pancreas is Insulin.

Insufficient production of insulin causes diabetes.

7. Why some of the adolescent boys have hoarse voice?

Ans: In adolescent boys, sometimes, the muscles of the growing voice box go out of control and the voice become hoarse.

8. Why is metamorphosis in frogs stopped in iodine deficient water?

Ans: Metamorphosis in frogs is controlled by thyroxine hormone. Production of this hormone requires the presence of iodine in the water. Therefore, metamorphosis is stopped in iodine deficient water.

9. List the changes taking place in the body of the girls at puberty.

Ans: The changes that take place in the body of the girls are as follows:

- I. Sudden increase in height due to elongation of long bones, i.e., the bones of arm and the legs.
- II. The region below the waist becomes wider.
- III. Appearance of pimples and acne due to increased activity of sweat and sebaceous (oil) glands.
- IV. The ovaries enlarge and eggs begin to mature. Also matured eggs begin to release.
- V. Development of breast and mammary glands inside the breast.
- VI. Growth of hair under the arms and in the pubic region.

10. What are the changes taking place in the body of the boys at puberty?

Ans: The changes that takes place in the body of the boys at puberty are as follows:-

- i. Sudden increase in height.
- ii. Shoulder become broader and chest become wider.
- iii. Voice box or larynx become larger and seen as a protruding part of the throat and is known as Adam's apple.
- iv. The voice becomes deeper and hoarse.
- v. Appearance of pimples and acne on the face due to increased activity of sweat and sebaceous glands.
- vi. Testes and penis develop completely and testes begin to produce sperms.
- vii. Development of moustaches and beard, development of hair on the chest, under the arm and in the pubic region.

11. Draw a neat diagram of Adam's apple.

Ans:

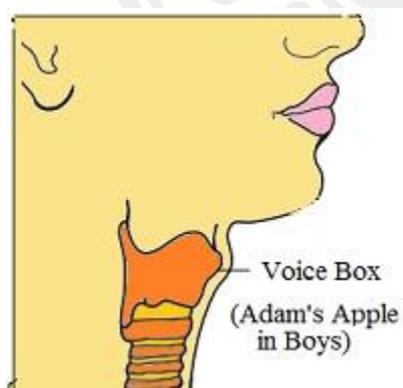


Fig.: Adam's apple.

12. Write a short note on adolescent pregnancy.

Ans: Adolescent pregnancy is harmful to the girls and the child. This is because teenage mothers are not prepared mentally or physically for motherhood. Early marriage and motherhood cause health problems in the mother and the child. It also curtails employment opportunities for the young women and may cause mental agony

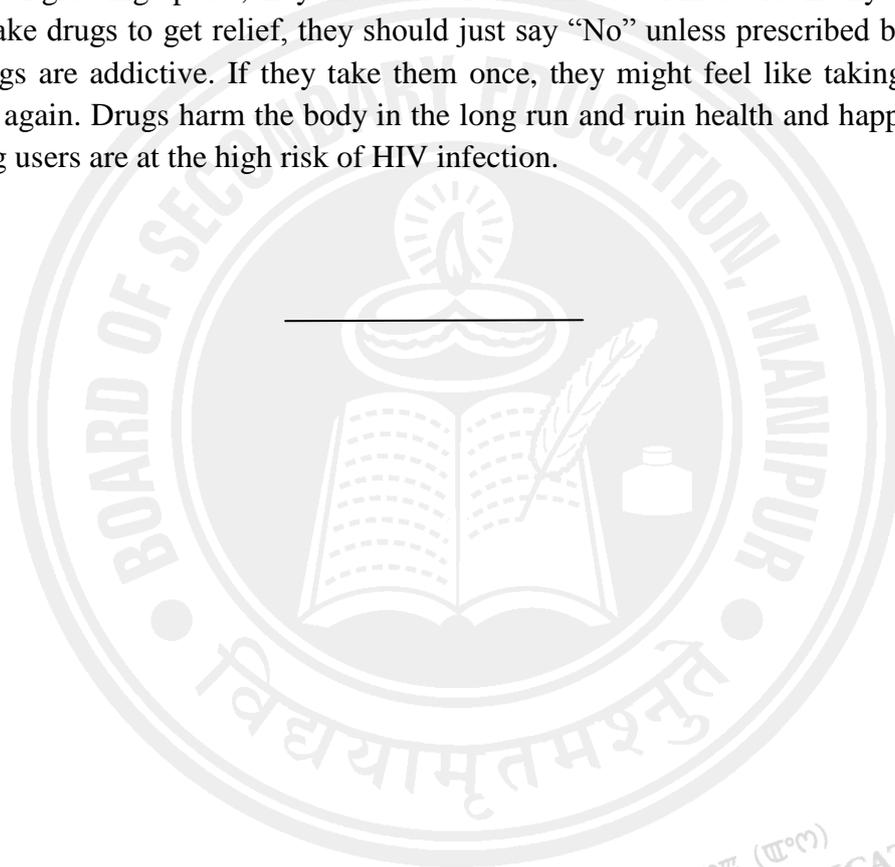
as she is not ready for responsibilities of motherhood. Therefore, the legal age for marriage, in our country, is 18 years for girls and 21 years for boys.

13. What will happen if personal hygiene is not maintained by adolescent?

Ans: If personal hygiene is not maintained by adolescent there are chances of catching bacterial infection. One should bath at least once everyday because the increased activity of sweat glands sometimes makes the body smelly. Girls should take special care of cleanliness during the time of menstrual flow.

14. Why should adolescent say “No” to drugs?

Ans: Adolescence is a period of much activity in the body and mind which is a normal part of growing up. So, they should not feel confused or insecure. If anybody suggests to take drugs to get relief, they should just say “No” unless prescribed by the doctor. Drugs are addictive. If they take them once, they might feel like taking them again and again. Drugs harm the body in the long run and ruin health and happiness. Again drug users are at the high risk of HIV infection.



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