

16 Human reproduction - answers

- 1** Fertilisation occurs when the nucleus (A) of a sperm cell fuses with the nucleus (B) of the ovum (C).
- 2** (a) The sperm (male gamete) is much smaller than the ovum (female gamete).
(b) The ovum is spherical and contains more cytoplasm than the sperm, which is elongated with a 'tail'.
(c) Sperms are produced in much greater numbers than the ova.
- 3** Before fertilisation can occur, the sperms must pass through the sperm duct, urethra, vagina, cervix, uterus and oviduct.
- 4** (a) Ovulation is the release of an ovum from a mature follicle in the ovary.
(b) Ovulation occurs approximately once every 28 days.
- 5** Sperms can fertilise an ovum for up to about three days after entering the female reproductive system, and the ovum survives for about one day.
- 6** (A) vagina, (B) cervix, (C) amnion, (D) uterus, (E) placenta, (F) oviduct, (G) fetus.
(i) Ovum matures in ovary, (ii) ovum released from follicle, (iii) sperms deposited at top of vagina, (iv) ovum enters oviduct, (v) sperm fertilises ovum, (vi) embryo implants in lining of uterus.
- 7** (a) (i) oxygen and digested food (glucose, amino acids) pass from maternal to fetal blood,
(ii) carbon dioxide and nitrogenous waste (urea) pass from fetal to maternal blood.
(b) The fetus's own heart pumps blood through the fetal vessels in the placenta.
- 8** The umbilical cord contains blood vessels which convey blood between the fetus and the placenta.
- 9** (a) Smoking during pregnancy can lead to an underweight fetus.
(b) If a pregnant woman catches rubella in the first 4 months of pregnancy, the fetal ears, eyes and nervous system may be damaged.
- 10** (a) Identical twins are derived from the products of a single zygote which divides into two at an early stage of development.
(b) Fraternal twins result from the simultaneous fertilisation of two ova.
- 11** (a) Blood tests can reveal the mother's Rhesus blood group and show whether she is anaemic.
(b) Urine tests can confirm the pregnancy and show if she is diabetic. Later in pregnancy, the presence of proteins in the urine implies restricted circulation in the placenta.

Human reproduction - answers (continued)

12 Contractions of the uterus begin, amnion breaks, amniotic fluid escapes, cervix dilates, abdominal contractions begin, baby's head emerges from vagina, baby's feet emerge from vagina, placenta expelled from uterus.

Note: The amnion may break earlier or later, but prior to emergence.

13 (a) Human milk is the correct composition for human babies and it contains antibodies to some diseases.

(b) The milk is free from bacteria and at the right temperature. Breast-feeding helps to establish a psychological bond between mother and baby.

14 (a) testosterone, (b) oestrogen(s).

15 (a) After ovulation, the follicle is replaced by the corpus luteum.

(b) The corpus luteum produces the hormone progesterone.

16 Human Reproduction

1 Fertilisation occurs when the(A)..... of the sperm cell fuses with the.....(B) of the (C)

2 State the differences between the male gametes and the female gametes with regard to (a) their size; (b) their structure, (c) their relative numbers.

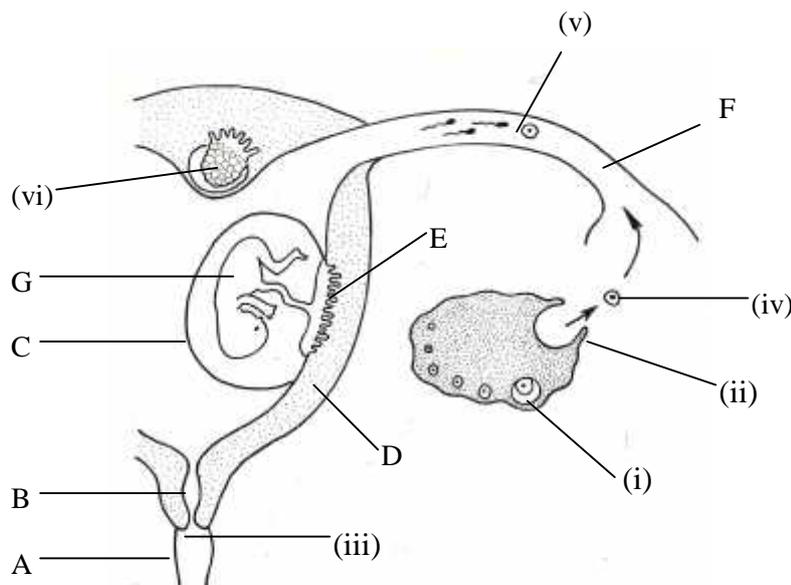
3 Before fertilisation can occur, the sperms have to travel from the testes to meet an ovum in the female organs. Using the list below, name the organs, in the correct order, through which the sperms will have to pass.

uterus, sperm duct, oviduct, urethra, cervix, vagina

4 (a) Explain what is meant by ovulation.
(b) How often does it occur in humans?

5 Explain why the chance of fertilisation in humans is restricted to only a few days each month.

6 The diagram below represents the events leading up to fertilisation (v), implantation (vi) and development. In each case name the structures involved and, at the numbers, state briefly what is happening or what has happened previously.



7 Blood from the fetus circulates through the placenta.

(a) What substances pass (i) from the maternal to the fetal blood, (ii) from the fetal to the maternal blood?

(b) By what means is the fetal blood circulated through the placenta?

8 What is the function of the umbilical cord?

9 What are the possible effects on the fetus if, during pregnancy, the mother (a) smokes, (b) catches rubella?

10 Describe the events which lead to the formation of (a) identical twins, (b) fraternal twins.

11 At an ante-natal clinic what can (a) blood tests, (b) urine tests reveal?

Human reproduction (continued)

12 Place the following events in the correct order for natural childbirth.

amniotic fluid expelled, placenta expelled from uterus, baby's feet emerge from vagina, abdominal contractions begin, baby's head emerges from vagina, amnion breaks, cervix dilates, contractions of the uterus begin .

13 (a) What are the advantages of human milk over cows' milk for feeding babies?

(b) Apart from the composition of the milk, what are the other advantages of breast-feeding?

14 Name (a) the male sex hormone and (b) the female sex hormone which help bring about the changes at puberty .

15 After ovulation (a) what structure replaces the Graafian follicle, (b) what hormone does it produce?