

CONTROLLING FERTILITY

Q:1 Read the passage about IVF (in-vitro fertilisation) and embryo-splitting.

“IVF is not as successful as we would like it,” says scientist Michael Tucker. “On average, only one in five or one in six of all the embryos that we generate in the IVF lab will develop as far as full-term delivery as a baby.”

“There is a way to perhaps double those odds. A new, identical embryo is split off from the original embryo made in the IVF lab.”

“What we are really doing is creating an identical twin,” says scientist Dr Hilton Kort.

“And that’s what happens in nature every day. Cloning is creating a replica of a person or an animal.”

(a) Explain why the two embryos will develop into identical twins.

(2 marks)

(b) Explain why the embryos are not clones of their parents.

(2 marks)

(c) The scientists want to develop this technique, but are afraid to do so because public opinion might be against the technique.

Suggest an explanation for this.

(1 mark)

Q:2 Hormones are used in contraceptive pills.

(a) Explain how a contraceptive pill works.

(2 marks)

(b) Read the information about the trialling of the first contraceptive pill.

The Pill was developed by a team of scientists led by Gregory Pincus. The team needed to carry out large scale trials on humans.

In the summer of 1955, Pincus visited the island of Puerto Rico. Puerto Rico is one of the most densely populated areas in the world. Officials supported birth control as a form of population control. Pincus knew that if he could demonstrate that the poor, uneducated women of Puerto Rico could use the pill correctly then so could women anywhere in the world.

The scientists selected a pill with a high dose of hormones to ensure that no pregnancies would occur while test subjects were taking the drug. The Pill was found to be 100% effective when taken properly. But 17% of the women in the study complained of side effects. Pincus ignored these side effects.

The women in the trial had been told only that they were taking a drug that prevented pregnancy. They had not been told that the Pill was experimental or that there was a chance of dangerous side effects.

Evaluate the methods used by Pincus in trialling the contraceptive pill.

(5 marks)

Q:3 In-vitro fertilisation (IVF) is used to help infertile women to have babies. The table gives statistics from one clinic that gives IVF treatment.

	Age of women given IVF treatment			
	Under 35 years	35–37 years	38–39 years	40–42 years
Number of women treated	425	208	106	53
Number of single births	90	44	17	1
Number of sets of twins	24	8	4	1
Number of sets of triplets	1	0	0	0

Use data from the table to help you to answer these questions.

(a) How many of the women aged 38 –39 had babies?

(1 mark)

(b) What proportion of the treated women aged 35 –37 had twins?

(1 mark)

(c) For which age group was IVF treatment most successful?

(1 mark)

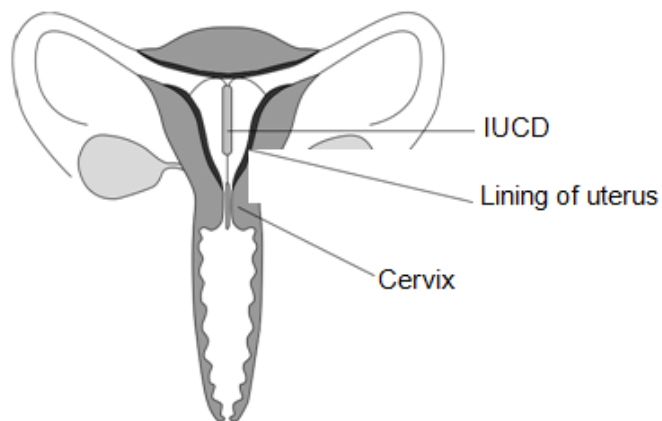
(d) Give two disadvantages of IVF treatment.

1 _____

2 _____

(2 marks)

Q:4 The diagram shows an intra-uterine contraceptive device (IUCD).



The IUCD is put inside the uterus (womb). The IUCD contains a hormone.

The hormone diffuses directly into the uterus. The supply of hormone in the IUCD lasts for about five years.

The hormone works by:

causing the cervix to produce a thick plug of mucus

causing the lining of the uterus to become very thin.

For every 1000 women using the IUCD for one year about 2 women become pregnant. There are about 10 pregnancies for every 1000 women using the contraceptive pill for one year.

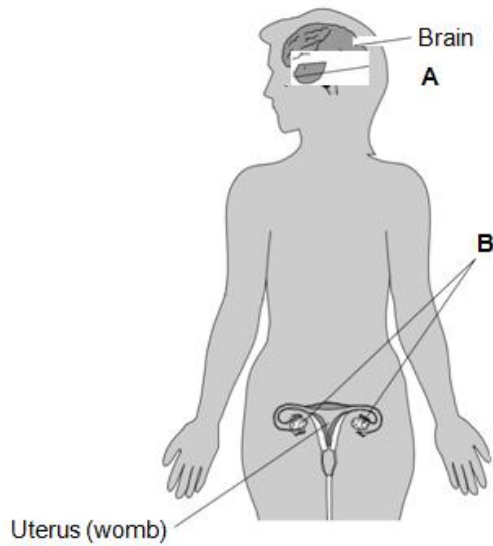
Evaluate the use of the IUCD compared with the contraceptive pill.

Use the information in this question and your own knowledge and understanding.

Remember to give a conclusion to your evaluation.

(4 marks)

Q:5 The diagram shows the position of two glands, A and B, in a woman.



(a) (i) Name glands A and B.

A _____

B _____

(2 marks)

(a) (ii) Gland A produces the hormone Follicle Stimulating Hormone (FSH).

FSH controls changes in gland B.

How does FSH move from gland A to gland B?

(1 mark)

(b) (i) A woman is not able to become pregnant. The woman does not produce mature eggs.

The woman decides to have In Vitro Fertilisation (IVF) treatment.

Which two hormones will help the woman produce and release mature eggs?

Tick (☑) one box.

FSH and Luteinising Hormone (LH)

FSH and oestrogen

Luteinising Hormone (LH) and oestrogen

(1 mark)

(b) (ii) Giving these hormones to the woman helps her to produce several mature eggs. Doctors collect the mature eggs from the woman in an operation.

Describe how the mature eggs are used in IVF treatment so that the woman may become pregnant.

(3 marks)

(b) (iii) IVF clinics have been set a target to reduce multiple births.

At least 76 % of IVF treatments should result in single babies and a maximum of 24 % of treatments should result in multiple births.

Suggest one reason why the clinics have been set this target to reduce multiple births.

(1 mark)

(c) Two clinics, R and S, used IVF treatment on women in 2007. Doctors at each clinic used the results of the treatments to predict the success rate of treatments in 2008.

The table shows the information.

	Total number of IVF treatments in 2007	Number of IVF treatments resulting in pregnancy in 2007	Predicted percentage success rate in 2008
Clinic R	1004	200	18–23
Clinic S	98	20	3–56

(c) (i) Compare the success rates of the two clinics in 2007.

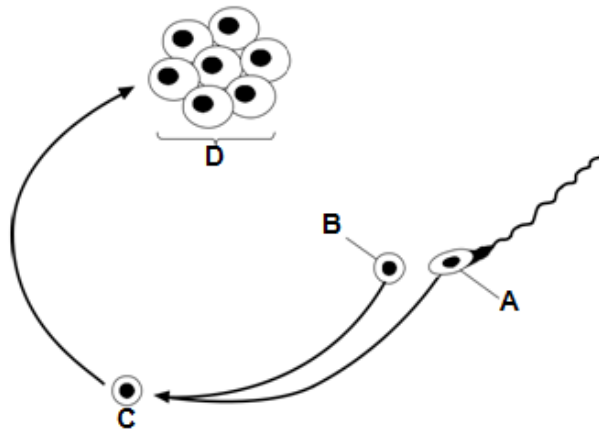
(1 mark)

(c) (ii) The range of the predicted success rate in 2008 for clinic R is much smaller than the range of the predicted success rate for clinic S.

Suggest why.

(2 marks)

Q:6 The diagram shows some of the stages in IVF (in vitro fertilisation).



(a) Use words from the box to name structures A, B, C and D.

egg	embryo	fertilised egg	ovary	sperm
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Structure A _____

Structure B _____

Structure C _____

Structure D _____

(4 marks)

(b) What do doctors do next with structure D?

(2 marks)

(c) The table gives statistics for an IVF clinic.

	Age of women treated			
	Below 35 years	35–37 years	38–39 years	40–42 years
Number of women treated	414	207	106	53
Number of women who produced one baby	90	43	17	1
Number of women who produced twins	24	8	4	1
Number of women who produced triplets	1	0	0	0

(c) (i) About what proportion of the treated women aged 35 – 37 years produced one or more babies?

Draw a ring around your answer.

one quarter one third half

(1 mark)

(c) (ii) This clinic does not give IVF treatment to women over 42 years of age. Use data from the table to explain why.

(2 marks)

(c) (iii) The committee which regulates IVF treatment now advises that only one embryo is used in each treatment.

Suggest one reason for this.

(1 mark)

TOTAL MARKS=48