**Q1.**          (a)     **List A** gives the names of three hormones.

**List B** gives information about the three hormones.

Draw a line from each substance in **List A** to the correct information in **List B**.

|  |  |  |
| --- | --- | --- |
| **List AHormone** |   | **List BInformation** |
|   |   | Used in some contraceptive pillsto stop eggs maturing |
| FSH |   |   |
|   |   | Used as a fertility drug to makeeggs mature |
| LH |   |   |
|   |   | Causes the lining of the wombto break down |
| Oestrogen |   |   |
|   |   | Stimulates the release of eggsin IVF |

**(3)**

(b)     The table gives information about three methods of giving hormones to stop a woman becoming pregnant.

|  |  |  |  |
| --- | --- | --- | --- |
|   | **The ‘pill’** | **The ‘patch’** | **The ‘implant’** |
| **How thehormoneis given** | Swallowed eachday for 21 days outof every 28 days. | Stuck onto the skin.Each patch lasts threeweeks.There is a one week gap between each patch. | Needs an operation toput it under the skin.Lasts for up to 5 years. |

Use the information in the table to answer these questions.

(i)     Which of the three methods is likely to be the most reliable?

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**(1)**

(ii)     Explain why you chose this method.

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**(1)**

(iii)     Give **one** disadvantage of the method you have chosen.

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**(1)**

**(Total 6 marks)**

**Q2.**(a)     Which organ of the human body produces egg cells?

Draw a ring around the correct answer.

**liver**                      **ovary**                      **testis**

**(1)**

(b)     An egg joins with a sperm and develops into an embryo.

How many chromosomes are there in each cell of a human embryo?

Draw a ring around the correct answer.

**23**                      **46**                      **48**

**(1)**

(c)     Some women find it difficult to have a baby. A doctor may suggest that these women should use In Vitro Fertilisation (IVF) to help them have a baby.

**Table 1** shows how successful IVF was for women of different ages at one clinic.

**Table 1**

|  |  |  |
| --- | --- | --- |
|   | **Age of women in years** | **Percentage of women who had a baby** |
|   |    <35 | 35 |
|   |    35–37 | 31 |
|   |    38–39 | 25 |
|   |    40–42 | 32 |
|   |    43–44 |   7 |
|   |    >44 |   0 |

(i)     A student thought that the result for women aged 40–42 was anomalous.

Suggest why the student thought this result was anomalous.

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**(1)**

(ii)     Describe the general trend in the results in **Table 1**.

You should ignore the anomalous result.

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**(1)**

(d)     Some babies are born with a faulty chromosome.

Scientists investigated whether the chance of having a baby with a faulty chromosome is also related to the age of the woman.

**Table 2** shows the scientists’ results.

|  |  |
| --- | --- |
|   | **Table 2** |
|   | **Age of women in years** | **Number of women per 1000 who had a baby with a faulty chromosome** |
|   |    25 |   2.0 |
|   |    30 |   2.6 |
|   |    35 |   6.1 |
|   |    40 | 19.6 |
|   |    45 | 66.0 |

(i)      A 45-year-old woman is more likely than a 25-year-old woman to have a baby with a faulty chromosome.

How many times more likely?

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Answer = ........................................... times

**(2)**

(ii)     Suggest **two** reasons why many fertility clinics will **not** accept women over 40 years of age for IVF treatment.

Use information from **Table 1** and **Table 2** in your answer.

1 ................................................................................................................

...................................................................................................................

2 ................................................................................................................

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**(2)**

**(Total 8 marks)**

**Q3.**          In-vitro fertilisation (IVF) is used to help some women get pregnant.

(a)     Name the **two** hormones used in IVF treatment.

1 .....................................................................................................................

2 .....................................................................................................................

**(2)**

(b)     The diagram shows the process of IVF.

Describe the process of IVF. Use information from the diagram to help you.

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**(4)**

**(Total 6 marks)**

**Q4.**         The graph shows how the likelihood of getting pregnant and the likelihood of infertility change with a woman’s age.

The data is for healthy women who have unprotected sexual intercourse during one year.

(a)     Use information from the graph to answer this question.

A woman in her mid-twenties is thinking about waiting until her late-thirties before she has children.
A doctor advises the woman not to wait.

Explain why the doctor gives this advice.

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**(2)**

(b)     The hormones FSH and LH are used in fertility treatment.

Give the function in fertility treatment of:

(i)      FSH

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**(1)**

(ii)      LH.

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**(1)**

(c)     In the first stage of in-vitro fertilisation (IVF), eggs from the mother are fertilised with sperm from the father.

Describe the next stages of IVF.

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**(2)**

**(Total 6 marks)**

**Q5.**          Hormones can be used as contraceptives.

(a)     Explain **one** way in which a hormone can prevent conception (pregnancy).

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**(2)**

(b)     Two methods of giving contraceptive hormones to a woman are the vaginal ring and the hormone implant.

**Vaginal ring**

The vaginal ring is a flexible ring 54 mm in diameter containing hormones.

The woman puts in and takes out the vaginal ring herself; there is no ‘wrongߣ way to put the ring in.
Each ring is designed for one cycle of use, which is three weeks of continuous ring use, followed by one week without the ring.
About 0.3 % of women become pregnant in the first year of ring use.
4 % of women stop using the ring because of vaginal discomfort.

**Hormone implant**

A health professional puts the hormone implant under the skin of the woman’s arm.
The implant releases contraceptive hormones for three years before the implant needs to be replaced.
The hormone implant is 100 % effective.
About 2 % of women stop using the hormone implant, mainly because of irregular menstrual bleeding.

Evaluate the use of the vaginal ring compared with the hormone implant.

Remember to give a conclusion to your evaluation.

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**(4)**

**(Total 6 marks)**

**Q6.**          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.

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**(4)**

**(Total 4 marks)**

**Q7.**Endocrine glands produce hormones.

(a)     Hyperthyroidism is caused by an overactive thyroid gland.

Suggest what would happen in the body of a person with hyperthyroidism.

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**(3)**

(b)     Describe the roles of FSH and LH in the menstrual cycle.

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**(2)**

(c)     The combined pill is a contraceptive that contains progesterone **and** oestrogen.

The ‘mini-pill’:

•        is a contraceptive that **only contains** the progesterone hormone

•        has to be taken at the same time each day to prevent pregnancy.

The success rate of the mini-pill in preventing pregnancy is lower than that of the combined pill.

Explain why missing a dose of the mini-pill would reduce the success rate of the mini-pill.

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**(4)**

**(Total 9 marks)**

**M1.**          (a)

*mark each line from left hand box*

*two lines from left hand box cancels mark for that box*

**3**

(b)     (i)      implant

**1**

(ii)     any **one** from:

*allow explanation for their method in (b)(i)*

•        lasts for 5 years / long(est)

•        cannot forget to take / replace it / lose it

•        (hormone) there all the time

*ignore expense*

*ignore STDs*

*ignore side effects*

**1**

(iii)    any **one** from:

*accept correct disadvantage for wrong method in (b)(i)*

•        needs surgery / operation

*allow it could go wrong*

•        painful

•        infection

•        have to wait five years for a child or more difficult to have a change of mind

*ignore expense*

*ignore STDs*

*ignore side effects*

**1**

**[6]**

**M2.**(a)     ovary

**1**

(b)     46

**1**

(c)     (i)      does not fit the pattern

**or**

it is higher than the 3rd value / it should be lower than the 3rd value / it should be between the 3rd and 5th values

*do* ***not*** *allow use of incorrect figures*

**1**

(ii)     As age increases % of women (having a baby) decreases

**1**

(d)     (i)      33

*allow 1 mark for*

*if no answer / wrong answer*

**2**

(ii)     low success rate

**1**

more likely to have a baby with health problems / abnormalities / a faulty chromosome

**1**

**[8]**

**M3.**          (a)     FSH / follicle stimulating hormone

*allow FHS*

*either order*

**1**

LH / luteinizing hormone

**1**

(b)     any **four** from:

•        egg(s) collected from ovary

•        (eggs) mixed with sperm **or** fertilisation occurs

*allow eggs and sperm put into tube*

•        fertilised egg divides

•        embryo formed

•        (embryos) inserted into womb / uterus

*ignore references to vagina*

•        FSH matures egg **and** LH releases eggs

**4**

**[6]**

**M4.**          (a)     chance of getting pregnant decreases with age

*ignore figures*

**1**

chance of infertility increases with age

**1**

(b)     (i)      causes eggs to mature

*allow growth*

*do* ***not*** *accept produced*

*do* ***not*** *accept releases egg*

*ignore references to oestrogen / LH / uterus / womb*

**1**

(ii)     causes egg release

*do* ***not*** *accept matures egg / growth of egg / produces egg*

*ignore references to other hormones and uterus / womb*

**1**

(c)     embryo

*allow (fertilised) egg divides*

**1**

insert (embryo) into womb / uterus

*ignore electric shock*

**1**

**[6]**

**M5.**          (a)     inhibit FSH production

*ignore LH production*

*ignore wrong hormone*

**1**

so egg does not mature

*ignore egg production / egg release / egg development*

**1**

(b)     any **three** comparisons: eg

•        ease of insertion compared ie ring easily inserted by woman whereas
implant needs professional **or** no damage to skin with ring

*comparisons must be made ie two separate lists will gain no marks unless the lists are linked by eg whereas / however / on the other hand* ***and*** *the points are made in the same order in both lists*

•        length of delivery compared eg 3 weeks for ring whereas 3 years for implant
**or** delivery longer for implant
**or**woman has to remember to insert ring whereas does not have to remember
to insert implant

*ignore cost*

•        effectiveness compared eg 0.3 % failure with ring whereas nil for implant **or**implant more effective

•        number giving up compared eg 4 % for ring whereas 2 % for implant **or** fewer women give up using implant

**or** ring might cause vaginal discomfort whereas implant may cause irregular menstrual bleeding

**3**

reasoned conclusion (normally at the end)

*ie must state ‘better because....’*

**1**

**[6]**

**M6.**          any **three** from:

*max* ***2*** *if only advantages* ***or*** *only disadvantages discussed*

*ignore ‘side effects’ unqualified*

*ignore side effects produced by hormones*

**advantages of IUCD over pill eg**

•        can’t forget to take it / have to take pill every day

*do* ***not*** *allow last 5 years unless qualified*

•        effect much longer than pill

•        more effective in preventing pregnancy

*do* ***not*** *allow reference to figures unless qualified*

•        stops sperm entering uterus

**disadvantages of IUCD over pill eg**

•        pain / uncomfortable / risk of infection / may damage uterus

•        prevents fertilised egg developing / ‘embryo rights’

*allow kills embryo*

•        needs replacement by doctor / nurse / professional
**or** access to IUCD is more difficult than pill
**or** IUCD is harder to come off than pill

**3**

argued conclusion

*must include a preference and a reference to* ***both*** *advantages and disadvantages****or*** *one is better in a given situation but the other is better in a different situation*

**1**

**[4]**

**M7.**(a)     Too much thyroxine is released into the blood

**1**

which raises BMR

**1**

causing increase in formation of glycogen / lipids / proteins

**or**

increase in rate of respiration

**or**

increase in breakdown of excess proteins

**1**

(b)     FSH causes eggs to mature and stimulate ovaries to produce oestrogen

**1**

LH stimulates the egg to be released

**1**

(c)     (missing a dose causes a) dip / drop in progesterone levels

**1**

(therefore) FSH is not inhibited anymore

**1**

(therefore) LH is not inhibited anymore

**1**

(and consequently) an egg is matured and released

*allow (and consequently) an egg is available to be fertilised*

**1**

**[9]**