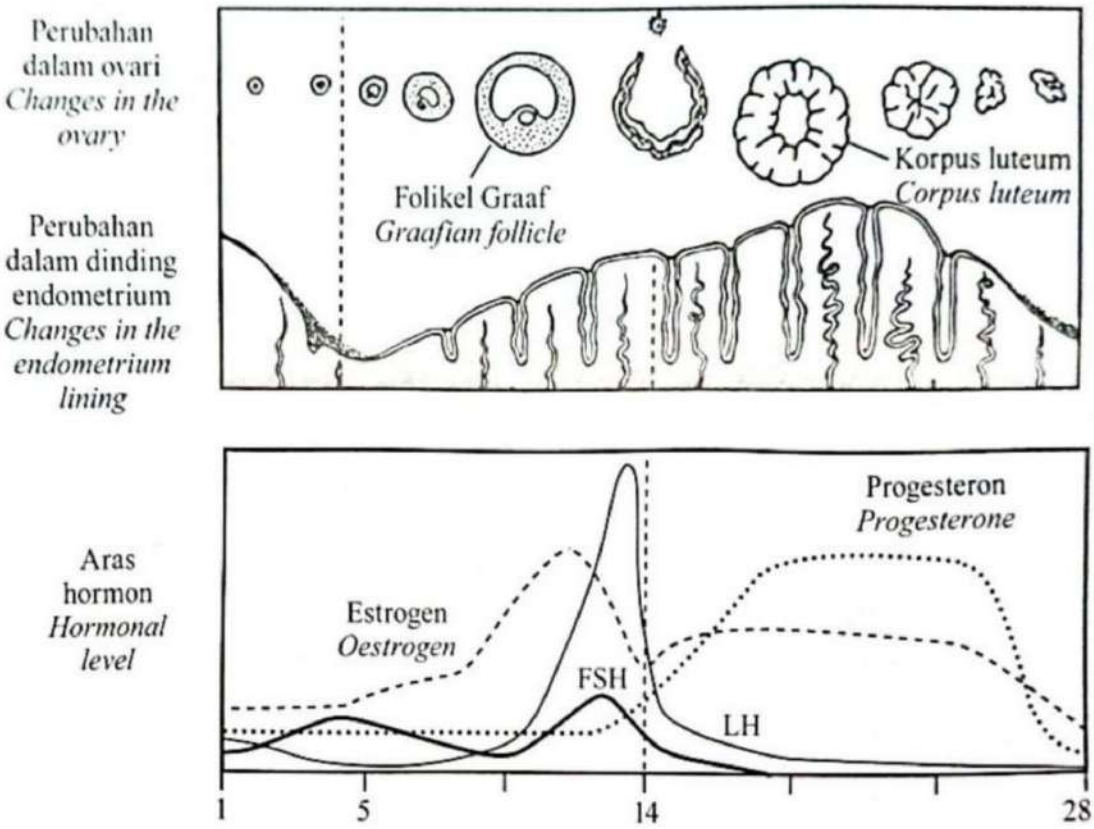
9. Rajah 9.1 menunjukkan perubahan dalam ovari, dinding endometrium dan rembesan hormon oleh kelenjar pituitari dan ovari semasa kitar haid.

Diagram 9.1 shows the changes in the ovary, endometrium lining and hormonal secretion by the pituitary gland and ovary during the menstrual cycle.



Rajah 9.1

Diagram 9.1

a. (i) Terangkan maksud sindrom prahaid.

Explain the meaning of premenstrual syndrome.

[2 markah]

[2 *marks*]

P1 Sindrom prahaid ialah gejala emosi dan fizikal yang dialami oleh wanita 7 hingga 14 hari sebelum hari pertama haid

Premenstrual syndrome is the emotional or physical symptoms that appear between 7 to 14 days before the first day of the menstrual cycle

P2 Berlaku akibat ketidakseimbangan aras estrogen dan progesteron dalam kitar haid

Due to the imbalance of oestrogen and progesterone hormones within the menstrual cycle

(ii) Berdasarkan Rajah 9.1, bincangkan perkaitan antara aras hormon dengan perubahan yang berlaku di dalam ovari dan lapisan endometrium semasa kitar haid.
Based on Diagram 9.1, discuss the relationship between the level of hormones with the changes that occur in the ovary and the endometrial layer during menstrual cycle.

[10 markah]
[10 *marks*]

P1 Pada hari 1 hingga hari 5, kelenjar pituitari merembeskan hormon perangsang folikel (FSH) dan hormon peluteinan (LH)
Day 1 to day 5, pituitary gland releases follicle-stimulating hormone (FSH) and luteinising hormone (LH)

P2 **FSH merangsang perkembangan folikel (dalam ovari)**
FSH stimulates follicle growth (in the ovary)

P3 Sel-sel folikel yang sedang berkembang merembes hormon estrogen
Growing follicles release oestrogen

P4 Pada hari 6 hingga hari 14, kepekatan estrogen meningkat / memuncak pada hari 12
Day 6 to day 14, oestrogen level rises / peaks on day 12

P5 **Estrogen memulih dan membaiki dinding uterus**
Oestrogen encourages endometrial wall repair

P6 **Aras LH mencapai kemuncak pada hari 13**
LH level rises peaks on day 13

P7 dan **merangsang ovulasi** / oosit sekunder dibebaskan dari folikel Graaf pada hari 14
*and **stimulates ovulation** / secondary oocyte release from Graafian follicle on day 14*

P8 **LH merangsang tisu folikel tertinggal membentuk korpus luteum**
LH stimulates the follicular tissue left behind transforms into corpus luteum

P9 Pada hari 15 ke hari 21, LH merangsang korpus luteum merembes hormon estrogen dan progesteron
Day 15 to day 21, LH stimulates corpus luteum to secrete oestrogen and progesterone

P10 **Progesteron merangsang endometrium menjadi lebih tebal / kaya dengan salur darah**
Progesterone stimulates endometrial wall thickening / enriching with blood vessels

P11 untuk penempelan embrio jika berlaku persenyawaan
for embryo implantation if fertilisation takes place

P12 **Aras progesterone dan estrogen yang tinggi merencat rembesan FSH dan LH**
High level of progesterone and oestrogen inhibits the secretion of FSH and LH

P13 Pada hari 22 hingga hari 28, jika persenyawaan tidak berlaku, aras LH menurun
Day 22 to day 28, if fertilisation does not take place, LH level decreases

P14 korpus luteum merosot / rembesan estrogen dan progesteron dihentikan
corpus luteum degenerate / stops the secretion of oestrogen and progesterone

P15 endometrium luruh / haid berlaku
endometrium will shed / menstruation begins

b. Puan X mengalami kesukaran untuk mengandung dengan cara semula jadi kerana tiub falopio beliau telah tersumbat. Puan X dan suaminya tetap bercadang untuk melahirkan anak mereka sendiri.

Terangkan **satu** teknik moden yang boleh digunakan oleh pasangan tersebut untuk hamil.

Puan X had difficulty conceiving naturally because her fallopian tubes were blocked. Puan X and her husband still plan to give birth to their own child.

Explain **one** *modern technique that the couple can use to conceive.*

P1 Persenyawaan in-vitro / *In-vitro fertilisation* (IVF) [4 markah] [4 *marks*]

P2 Oosit sekunder dikeluarkan daripada ovari Puan X
Secondary oocytes are retrieved from Puan X's ovary

P3 Sperma daripada suami dicampurkan bersama oosit sekunder Puan X di dalam piring petri
Sperms from his husband is mixed with her secondary oocytes in petri dish

P4 Persenyawaan berlaku / Sperma mensyewakan oosit sekunder membentuk zigot
Fertilisation occurs / Sperms fertilise secondary oocytes to form zygotes

P5 Zigot berkembang membentuk ovari / *Zygotes develop into embryos*

P6 Embrio dimasukkan ke dalam uterus Puan X untuk penempelan
Embryos are transferred into Puan X's uterus for implantation

P7 Embrio berkembang membentuk fetus
Embryos develop into foetus

c. Puan X telah disahkan hamil namun selepas bulan ketiga, beliau mengalami pendarahan akibat perubahan aras hormon.

Terangkan punca situasi yang dialami oleh Puan X dan cadangkan cara untuk mengatasinya.

Puan X was confirmed to be pregnant but after the third month, she experienced bleeding due to changes in hormone levels.

Explain the cause of the situation experienced by Puan X and suggest ways to overcome it.

P1 Korpus luteum gagal berkembang / *Corpus luteum fails to develop* [4 markah] [4 *marks*]

P2 Hormon progesteron kurang dirembes / *Less progesterone is secreted*

P3 Endometrium meluluh / gagal menebal / *Endometrium disintegrates / fails to thicken*

P4 tidak dapat menyokong fetus / *cannot support the foetus*

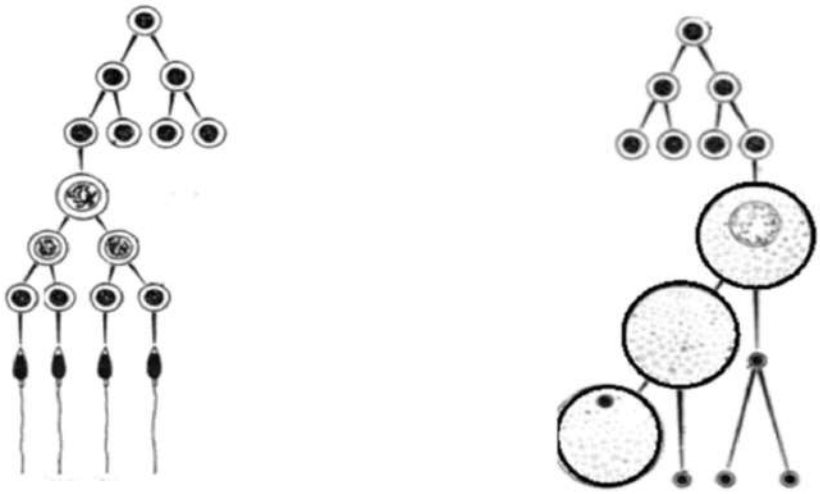
P5 menyebabkan keguguran / *causing miscarriage*

P6 Dapatkan suntikan hormon progesteron / mengambil pil hormon progesteron
Get progesterone hormone injection / take progesterone hormone pills

P7 membantu penebalan endometrium / *helps the thickening of endometrium*

P8 untuk menyokong perkembangan fetus / *to support foetus development*

4. Rajah 4.1 menunjukkan dua proses P dan Q yang berlaku di dalam sistem pembiakan manusia.
Diagram 4.1 shows two processes of P and Q that occur in the human reproductive system.



P Q

Rajah 4.1 / *Diagram 4.1*

(a) (i) Nyatakan nama proses P dan proses Q.
State the name of the process P and process Q.

P : Spermatogenesis

Q : Oogenesis

[2 markah/*marks*]

(ii) Nyatakan organ di mana berlakunya proses tersebut.
Name the organ where the process takes place.

P : Testis

Q : Ovari / *Ovary*

[2 markah/*marks*]

(iii) Bandingkan kedua-dua proses tersebut.
Compare the two processes.

S1 Kedua-duanya **proses gametogenesis** / *Both are gametogenesis process*

S2 Kedua-duanya **berlaku dalam organ pembiakan** / *Both occur in reproductive organ*

S3 Kedua-duanya **menghasilkan gamet yang haploid** / *Both produce haploid gametes*

D1 P berlaku dalam **testis**, Q berlaku dalam **ovari** / *P takes place in testis, Q takes place in ovary*

D2 P menghasilkan **empat sperma**, Q menghasilkan **satu oosit sekunder** dan tiga jasad kutub
P produces four sperms, Q produces one secondary oocyte and three polar bodies

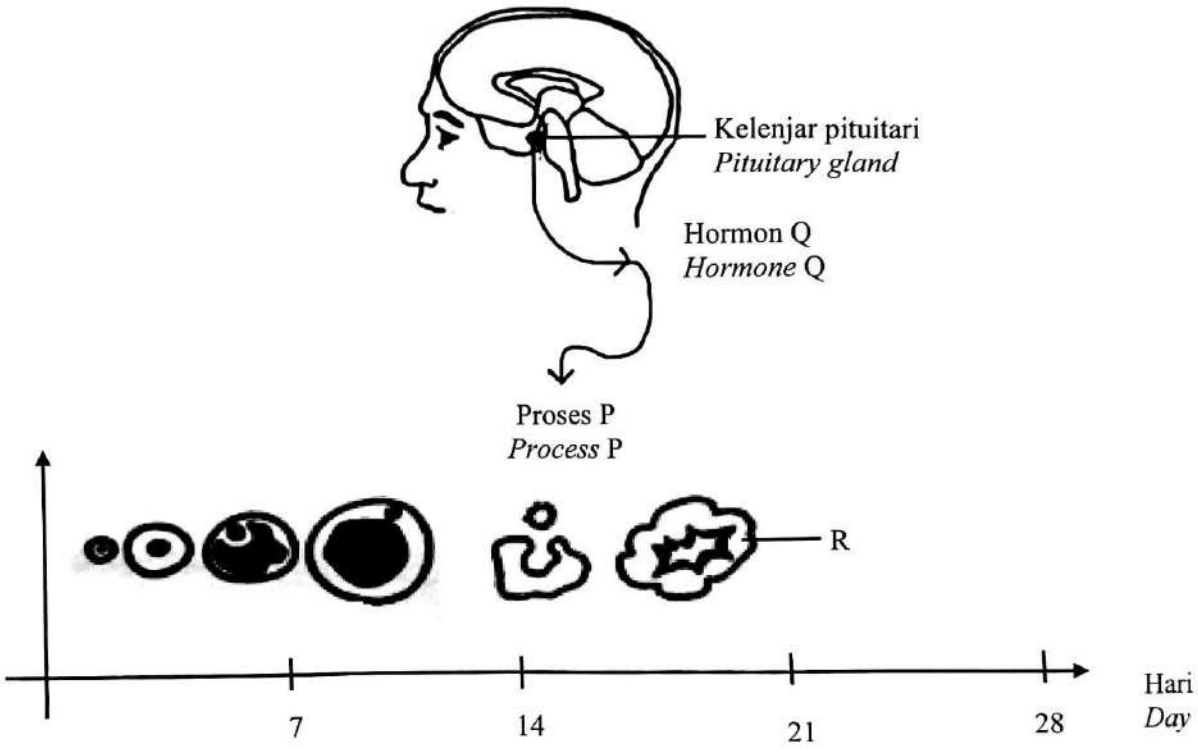
[3 markah/*marks*]

D3 ***P meiosis process is completed, Q meiosis process only completed when sperm fertilises oocyte***

D4 P **penghasilan sperma berterusan** dari akli baligh sehingga lanjut usia, Q **penghasilan oosit bermula dari fetus** dan berhenti apabila bayi dilahirkan, proses diteruskan dari akil baligh sehingga putus haid
P Production of sperm is continuous from puberty until old age, Q Production of oocytes starts in the female foetus, remains dormant when the baby is born & continues from puberty until menopause

D5 P **Berjuta sperma dihasilkan setiap hari**, Q **Satu oosit sekunder dibebaskan pada setiap kitar haid**
P Millions of sperms are formed every day, Q One oocyte is released at every menstrual cycle

11 (a) Rajah 11.1 menunjukkan pengawalan hormon Q terhadap perkembangan dalam ovari .
Diagram 11.1 *shows the regulation of hormones* Q *towards the development in the ovary.*



Rajah 11.1
Diagram 11.1

Berdasarkan Rajah 11.1;
Based on Diagram 11.1*;*

(i) Terangkan kesan kepada kehamilan jika struktur R tiba-tiba merosot pada trimester pertama kehamilan.
Explain the effect to the pregnancy if structure R *suddenly degenerate during first trimester of the pregnancy.*

[5 markah] [5 *marks*]

P1 R ialah **korpus luteum** / *R is corpus luteum*

P2 **Saiz** R **merosot** / *Size R decreases*

P3 **Hormon progesteron** kurang dirembes / *Less progesterone is secreted*

P4 **Ketebelan endometrium** berkurang / menipis // *The thickness of endometrium reduces*

P5 **Endometrium** meluluh / gagal menebal / *Endometrium disintegrates / fails to thicken*

P6 **Embrio** gagal menempel / *Embryo fails to implant*

P7 menyebabkan **keguguran** / *causing miscarriage*

(ii) Seorang wanita telah mengambil pil perancang kehamilan yang mengandungi hormon yang dirembeskan oleh struktur R dengan kepekatan yang tinggi bermula pada hari pertama haid setiap hari.
Terangkan kesan pengambilan pil kehamilan tersebut ke atas perembesan hormon Q dan proses P.

A woman has taken a contraceptive pills containing a hormone secreted by the structure R *in high concentration starting on the first day of menstruation every day.*
Explain the effect of taking the contraceptive pills on the secretion of hormone Q *and process* P.

[3 markah] [3 *marks*]

P1 Pil mengandungi **hormon progesteron / estrogen**
The pill contains progesterone / oestrogen hormone

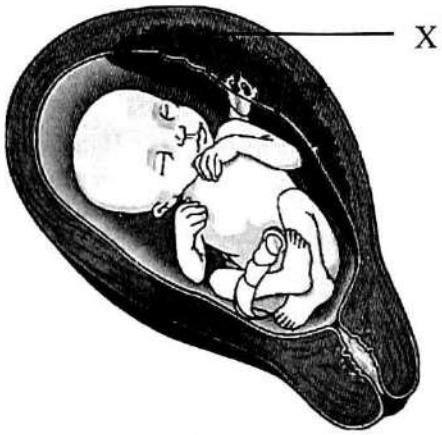
P2 yang **merencat rembesan hormon Q** / hormon peluteinan (LH)
that inhibits the secretion of hormon Q / luteinising hormone (LH)

P3 **Proses P / Ovulasi** tidak berlaku / *Process P / ovulation does not occur*

P4 **Oosit sekunder** tidak dibebaskan / *Secondary oocytes are not released*

P5 **Persenyawaan** tidak berlaku / *Fertilisation does not occur*

(b) Rajah 11.2 menunjukkan struktur X yang terdapat di endometrium semasa kehamilan.
Diagram 11.2 *shows structure* X *found in the endometrium during pregnancy.*



Rajah 11.2
Diagram 11.2

Terangkan peranan X yang mempunyai perkaitan dengan struktur R pada Rajah 11.1.
Explain the role of X *in relation to the structure* R *in Diagram* 11.1.

[2 markah] [2 *marks*]

P1 X ialah plasenta / *X is placenta*

P2 X bertindak sebagai organ endokrin / *X acts as endocrine organ*

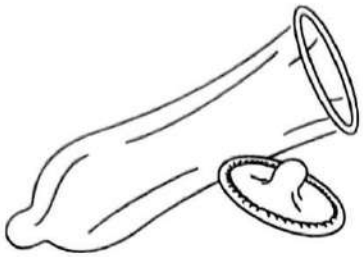
P3 Selepas struktur R / *korpus luteum merosot* pada bulan ke-4 kehamilan
After structure R / corpus luteum degenerates in the fourth months of pregnancy

P4 X menggantikan R / *X replaces R*

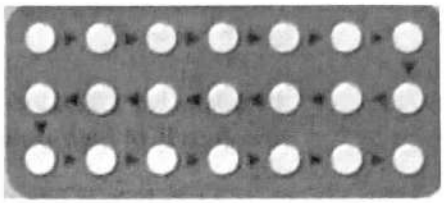
P5 menghasilkan progesteron / estrogen // *producing progesterone / oestrogen*

P6 untuk mengekalkan ketebalan endometrium // *to maintain endometrial thickness*

(c) (i) Rajah 11.3 menunjukkan dua kaedah pencegahan kehamilan.
Diagram 11.3 *shows two contraceptive methods.*



Kondom
Condom



Pil pencegahan kehamilan
Contraceptive pills

Rajah 11.3
Diagram 11.3

Pasangan suami isteri yang baru berkahwin masih belum bersedia untuk mempunyai anak. Mereka telah memilih dua kaedah pencegahan kehamilan seperti dalam Rajah 11.3. Bincangkan kebaikan dan keburukan mengamalkan kaedah pencegahan kehamilan ini.
Newly married couples are not yet ready to have children. They have chosen two contraceptive methods as shown in Diagram 11.3. *Discuss the advantages and disadvantages of this contraceptive methods.*

KEBAIKAN

[5 markah] [5 *marks*]

P1 Kedua-dua kaedah dapat merancang kehamilan / mencegah kehamilan tidak dirancang
Both methods helps to plan pregnancy / prevent unwanted pregnancy

P2 Kedua-dua kaedah meningkatkan keharmonian dalam perkahwinan
Both methods improve harmony in marriage

P3 Kedua-dua kaedah mengurangkan pengguguran
Both methods reduce abortion

P4 Kedua-dua kaedah tidak kekal / sementara / *Both methods are not permanent / temporary*

P5 Kedua-dua kaedah tidak melibatkan pembedahan / *Both methods do not involve surgery*

P6 Kedua-dua kaedah kos yang rendah / *Both methods low cost*

P7 Kondom menghalang persenyawaan / *Condom prevents fertilisation //*
Pil menghalang ovulasi / perkembangan folikel / *Pills prevent ovulation / follicle develompent*

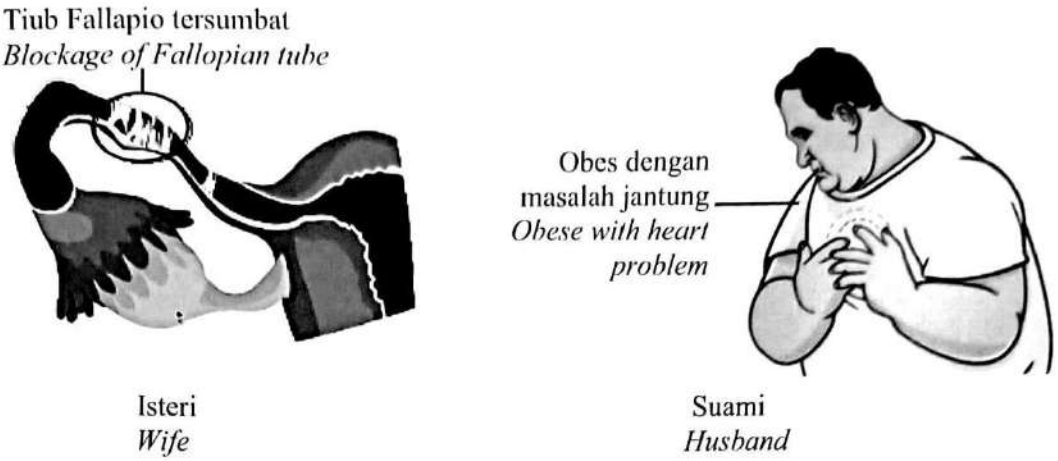
KEBURUKAN

P8 Pil perlu diambil setiap hari / Kondom perlu dipakai setiap kali persetubuhan
Pills must be consumed everyday / Condoms must be used every single intercourse

P9 Pil menyebabkan ketidakseimbangan hormon / *Pills cause imbalance hormones*

P10 Pil menyebabkan alahan / Kondom menyebabkan ketidakselesaan
Pills cause allergic / Condoms cause uncomfortable

(ii) Rajah 11.4 menunjukkan masalah fizikal dan kesihatan yang dihidapi oleh sepasang suami isteri.
Diagram 11.4 *shows the physical and health problems faced by a married couple.*



Rajah 11.4
Diagram 11.4

Pasangan tersebut tidak mempunyai anak walaupun telah berkahwin lebih 10 tahun. Mereka merancang untuk mempunyai anak secara biologi.
Terangkan apakah nasihat dan cadangan yang boleh anda berikan kepada mereka.
A couple do not have a child although more than 10 *years married. They plan to have a child biologically.*
Explain what are the advice and suggestions that can you give to them.

Kaedah 1

[5 markah] [5 *marks*]

P1 Persenyawaan in-vitro / *In-vitro fertilisation* (IVF)
P2 Oosit sekunder dikeluarkan daripada ovari Puan X
Secondary oocytes are retrieved from Puan X's ovary
P3 Sperma daripada suami dicampurkan bersama oosit sekunder Puan X di dalam piring petri
Sperms from his husband is mixed with her secondary oocytes in petri dish
P4 Persenyawaan berlaku / Sperma mensyewakan oosit sekunder membentuk zigot
Fertilisation occurs / Sperms fertilise secondary oocytes to form zygotes
P5 Zigot berkembang membentuk ovari / *Zygotes develop into embryos*
P6 Embrio dimasukkan ke dalam uterus Puan X untuk penempelan
Embryos are transferred into Puan X's uterus for implantation
P7 Embrio berkembang membentuk fetus
Embryos develop into foetus

Kaedah 2

P1 **Pembedahan** membuang bahagian tersumbat / *Surgery to remove the blockage*
P2 Membolehkan sperma berenang ke tiub falopio / **persenyawaan** berlaku
To enable the sperms can swim into fallopian tube / fertilisation occurs
P3 Membolehkan **embrio menempel** di endometrium
To enable the embryos can implant in the endometrium
P4 Mengamalkan **pemakanan seimbang** / Pinggan Malaysia
Practise a balances diet / Healthy Plate
P5 **Kerap bersenam** / *Exercise regularly*
P6 **Tidak merokok** / *Not smoking*

Kaedah 3
Ibu tumpang / *Surrogate mother*

For Examiner's Use

TRIAL N. SEMBILAN 2023

4 Rajah 4.1 menunjukkan peringkat-peringkat pertumbuhan belalang.
Diagram 4.1 shows the stages of grasshopper growth.

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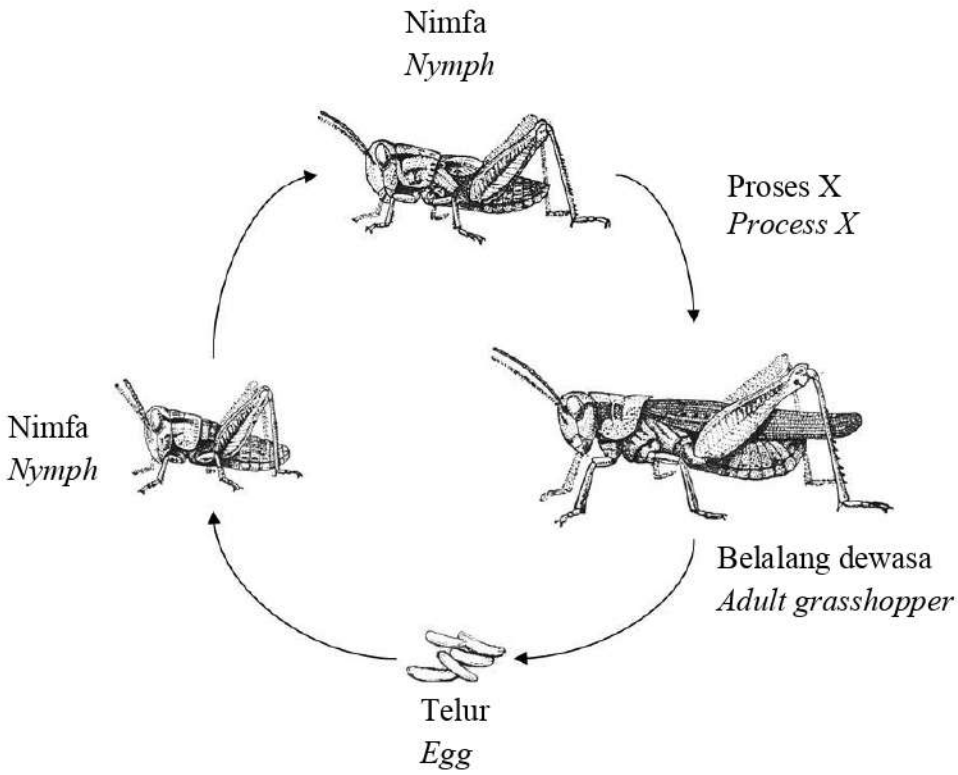


Rajah 4.1 / *Diagram 4.1*

(a) Namakan jenis pertumbuhan yang ditunjukkan oleh belalang.
Name the type of growth shown by the grasshopper.

Metamorfosis tidak lengkap / *Incomplete metamorphosis*
.....

[1 markah/*mark*]

4(a) 1

(b) (i) Namakan proses X.
Name process X.

Ekdisis / *Ecdysis*
.....

[1 markah/*mark*]

4(b)(i) 1

(ii) Terangkan mengapa belalang perlu menjalani proses X.
Explain why grasshopper need to undergo process X.

P1 Belalang mempunyai rangka luar yang keras / *Grasshopper has a hard exoskeleton*

P2 Rangka luar tidak membesar selaras dengan pertumbuhan serangga
Exoskeleton does not grow proportionally with the growth of insect

P3 Serangga perlu menyalin rangka luar / *Insects casts off outer cuticle*

P4 Bagi membolehkan pertumbuhan / pertambahan saiz
To enable the growth / increasing of size

[2 markah/*marks*]

4(b)(ii) 2

(iii) Proses X akan berlaku beberapa kali sehingga nimfa mencapai peringkat dewasa. Terangkan apa yang akan berlaku kepada nimfa selepas setiap proses X?
Process X will occur multiple times until the nymph reaches adulthood. Explain what will happen to the nymph after each process X?

P1 Rangka luar baharu terbentuk di bawah rangka luar lama
A new exoskeleton forms under old exoskeleton

P2 Serangga menambah isipadu badan dgn menyedut udara utk mengembangkan badan
Insects increase the volume of the body by sucking air to expand the body

P3 Rangka luar lama pecah / Belalang keluar dari rangka lama
The old exoskeleton breaks / The grasshopper comes out from the exoskeleton

P4 Belalang mengembangkan badan (sekali lagi) sebelum rangka baharu menjadi keras
The grasshopper expands the body (one more time) before new skeleton hardens

[2 markah/*marks*]

4(b)(iii) 2

(c) Nyatakan satu perbezaan pertumbuhan antara rama-rama dan belalang.
State one difference in growth between butterfly and grasshopper.

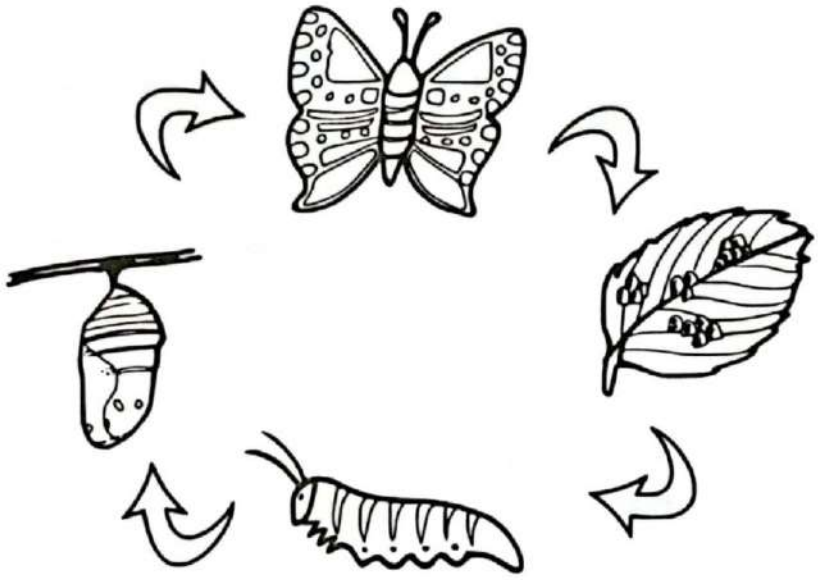
Rama-rama / *Butterfly*	Belalang / *Grasshopper*
P1 Metamorfosis lengkap *Complete metamorphosis*	P1 Metamorfosis tidak lengkap *Incomplete metamorphosis*
P2 Mengalami 4 peringkat pertumbuhan / telur, larva, pupa dan dewasa *Undergoes 4 stages of growth / egg, larva, pupa and adult*	P2 Mengalami beberapa peringkat ekdisis sebelum menjadi dewasa *Undergoes several stages of ecdysis before becoming an adult*

[1 markah/*mark*]

4(c) 1

Total A4 7

11 (*a*) Serangga yang berbeza mengalami pertumbuhan yang berbeza. Rajah 11.1 menunjukkan peringkat pertumbuhan satu serangga.
Different insects undergo different growth. Diagram 11.1 *shows the growth stages of an insect.*



Rajah 11.1
Diagram 11.1

Berdasarkan Rajah 11.1, terangkan jenis pertumbuhan yang berlaku pada serangga tersebut.
Based on Diagram 11.1, *explain the type of growth that occurs to the insect.*

[4 *markah*]
[4 *marks*]

P1 Serangga menjalankan metamorfosis lengkap
The insect undergoes complete metamorphosis

P2 Terdiri daripada 4 peringkat pertumbuhan iaitu telur, larva, pupa dan dewasa
Consists of 4 stages of growth; egg, larva, pupa and adult

P3 Rama-rama dewasa bertelur / *Adult butterfly lay eggs*

P4 Telur menetas menjadi larva / *Ulat beluncas // Egg hatch into larva / caterpillar*

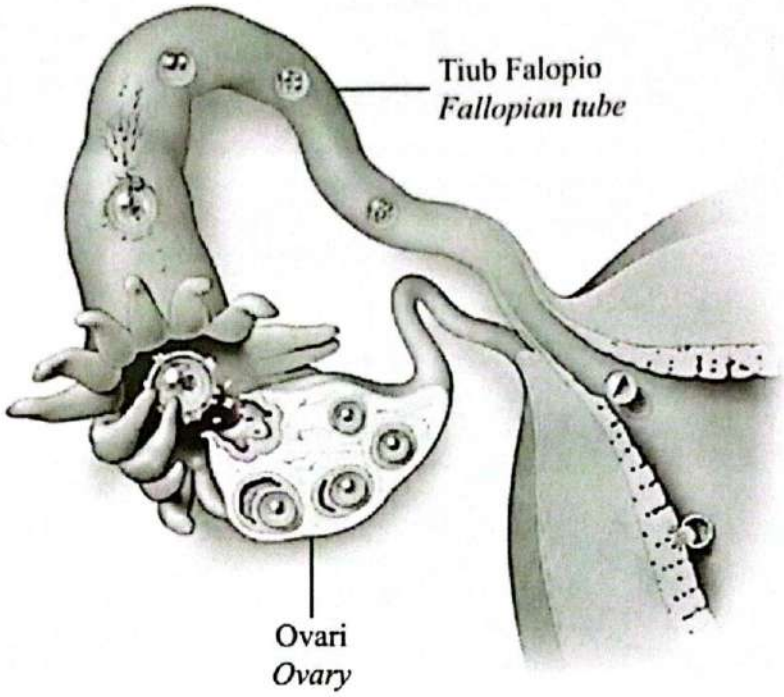
P5 Larva / Ulat beluncas makan daun untuk membesar // *Larva / Caterpillar eat leaves to grow*

P6 Larva / Ulat beluncas menjadi pupa // *Larva / Caterpillar becomes pupa*

P7 Rama-rama keluar dari pupa // *Butterfly emerges from pupa*

P8 Rama-rama membesar menajdi dewasa // *Butterfly matures into adult*

(*b*) Rajah 11.2 menunjukkan proses perkembangan awal embrio dalam salur pembiakan.
Diagram 11.2 *shows the process of early development of embryo in the reproductive tract.*



Rajah 11.2
Diagram 11.2

(i) Huraikan perkembangan embrio selepas persenyawaan sehingga penempelan.
Describe the development of embryo after fertilisation until implantation.

[4 *markah*]
[4 *marks*]

P1 Zigot membahagi berulang kembali secara mitosis
Zygote undergoes multiple division by mitosis

P2 membentuk embrio dua sel / *formed a two-cell embryo*

P3 Embrio dua sel membahagi membentuk empat sel, lapan sel dan akhirnya morula
The two-cell embryo divides to form four cells, eight cell and finally morula

P4 Morula berkembang menjadi blastosista / *Morula develops into blastocyte*

P5 Pergerakan embrio berlaku di sepanjang tiub Falopio sehingga sampai uterus
The movement embryo occurs along the Fallopian tube until reaches uterus

P6 Tindakan silium / peristalsis otot tiub Falopio menggerakkan embrio ke uterus
The action of cilia / peristalsis by the Fallopion tube muscles moves the embryo to uterus

P7 Blastosista menempel di dinding uterus / *Blastocyte implant in the endometrium*

P8 Blastosista berkembang menjadi embrio / *Blastocyte continues to grow into an embryo*

(ii) Seorang wanita hamil sering mengalami keguguran pada bulan ketiga kehamilannya disebabkan penempelan embrio tidak berlaku dalam uterus.
Wanita tersebut ingin mendapatkan zuriat dan bercadang untuk hamil semula.

Cadangkan satu rawatan hormon yang boleh dilakukan bagi mencegah keguguran berlaku dan memastikan kehamilan berjaya sehingga melahirkan anak.
Terangkan cadangan tersebut.

A pregnant woman often has miscarriage at the third month of gestation caused by failure of implantation of the embryo in the uterus.
She wanted to get a child and plan to get pregnant again.

Suggest a hormonal treatment that can be carried out to prevent miscarriage from occurring and to ensure the pregnancy is successful until the delivery of the baby.
Explain the suggestion.

[4 *markah*]
[4 *marks*]

P1 **Suntikan hormon progesteron** / *Injection of progesterone*

P2 Progesteron **merangsang penebalan endometrium** / menjadi lebih tebal, berlipat-lipat dan kaya dengan kapilari darah
Progesterone stimulates the thickening of the endometrium / making it thick, folded and rich in blood vessels

P3 bagi **persediaan penempelan embrio** / *to prepare for the implantation of embryo*

P4 Aras progesteron yang tinggi **merencat pengecutan uterus**
High level of progesterone inhibits the contraction of uterus

P5 Aras progesteron yang tinggi **merencat perembesan hormon perangsang folikel (FSH)**
High level of progesterone inhibits the secretion of follicle stimulating hormone (FSH)

P6 **merencat perkembangan folikel** dalam ovari
inhibits the development of follicle in ovary

P7 Aras progesteron yang tinggi **merencat perembesan hormon peluteinan (LH)**
High level of progesterone inhibits the secretion of luteinising hormone (LH)

P8 **merencat ovulasi** / *inhibits ovulation*

c) Rajah 11.3 menunjukkan dua jenis kembar.
Diagram 11.3 shows two types of twins.

J K

Rajah 11.3
Diagram 11.3

(i) Terangkan perbezaan di antara kembar J dan K.
Explain the differences between twins J and K.

[4 *markah*]
[4 *marks*]

	J	K
P1	Kembar tak seiras *Fraternal twins*	Kembar seiras *Identical twins*
P2	Hasil persenyawaan dua ovum dan 2 sperma *Product of fertilsation of* *two sperms and two ova*	Hasil persenyawaan satu ovum dan satu sperma *Product of fertilsation of* *one sperm and one ovum*
P3	Membentuk dua zigot *Form two zygotes*	Membentuk satu zigot *Form one zygote*
P4	Embrio tidak membahagi menjadi dua *Embryo does not divide into two*	Embrio membahagi menjadi dua *Embryo divides into two*
P5	Setiap fetus mempunyai plasenta sendiri *Each foetus has its own placenta*	Satu plasenta dikongsi oleh dua fetus *One placenta is shared by two foetus*
P6	Kandungan genetik kembar tidak sama *The genetic makeup of the twins* *are different*	Kandungan genetik kembar sama *The genetic makeup of the twins* *are similar*
P7	Sifat fizikal kembar tidak sama *Their physical appparances are different*	Sifat fizikal kembar sama *Their physical appparances are similar*
P8	Jantina kembar sama atau berbeza *The sex of both twin* *can be the same or different*	Jantina kembar sama *The sex of both twin* *is the same*

(ii) Pembentukan kembar K mengalami ketidaknormalan apabila pembahagian embrio berlaku secara tidak lengkap.
Terangkan akibat ketidaknormalan tersebut ke atas pembentukan kembar tersebut.

Formation of twins K *is having abnormality when there is incomplete division of the embryo.*
Explain the consequence of the abnormality on the formation of the twins.

[4 *markah*]
[4 *marks*]

P1 Menyebabkan pembentukan kembar Siam
Cause the formation of Siamese / cojoined twins

P2 Terdapat bahagian fizikal yang melekat
The physical parts fused together

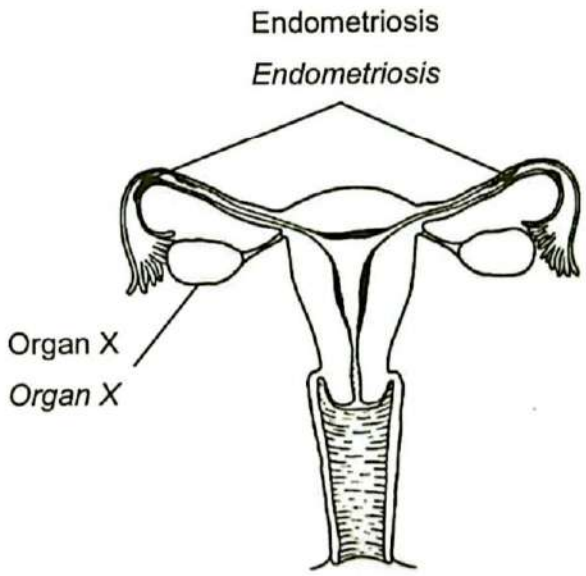
P3 Berkongsi organ dalaman / *Share internal organs*

P4 Pergerakan kembar terbatas / *Limited movement*

P5 Kebanyakan mati sebelum dilahirkan / Jangka hayat pendek
Most twins die before they are born / Shot lifespan

9. (a) Rajah 9.1 menunjukkan sistem pembiakan perempuan yang tiub fallopionya mempunyai endometriosis iaitu pembentukan dan pengumpulan tisu endometrium di luar uterus.

Diagram 9.1 shows the reproductive system of a woman whose fallopian tubes have endometriosis, which is the formation and accumulation of endometrial tissue outside the uterus.

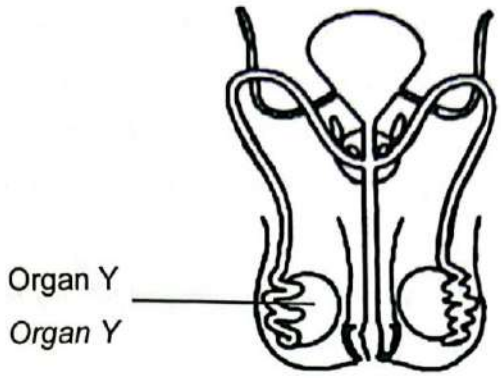


Rajah 9.1

Diagram 9.1

Rajah 9.2 menunjukkan organ yang terdapat dalam sistem pembiakan lelaki.

Diagram 9.2 shows an organ found in the male reproductive system.



Rajah 9.2

Diagram 9.2

Berdasarkan Rajah 9.1 dan 9.2,

Based on Diagram 9.1 and 9.2,

(i) Banding bezakan proses gametogenesis yang berlaku pada organ X dan organ Y.

Compare and contrast the process of gametogenesis that occurs in organ X and organ Y.

[7 markah]

[7 *marks*]

	Gametogenesis di Organ X	**Gametogenesis di Organ Y**
S1	Proses pembentukan sel pembiakan / gamet *The production of gametes / reproductive cells process*	
S2	Berlaku dalam organ pembiakan / *Take place in reproductive organs*	
S3	Menghasilkan gamet yang haploid / *Produce haploid gametes*	
D1	Oogenesis	Spermatogenesis
D2	Berlaku dalam ovari *Takes place in ovary*	Berlaku dalam testis *Takes place in testis*
D3	Oogonium menghasilkan satu oosit sekunder *Oogonium produces one secondary oocyte*	Spermatogonium menghasilkan empat sperma *Spermatogonium produces four sperms*
D4	Meiosis II hanya lengkap selepas sperma mensenyawakan oosit sekunder *Meiosis II completed when a sperm fertlises the secondary oocyte*	Meiosis lengkap *Meiosis is completed*
D5	Penghasilan oosit bermula dari fetus dan berhenti apabila bayi dilahirkan, proses diteruskan dari akil baligh sehingga putus haid *Production of oocytes starts in the female foetus, remains dormant when the baby is born & continues from puberty until menopause*	P penghasilan sperma berterusan dari akli baligh sehingga lanjut usia, *P Production of sperm is continuous from puberty until old age*
D6	Hanya satu oosit sekunder dibebaskan pada setiap kitar haid *Onle one secondary oocyte is released at every menstrual cycle*	Berjuta-juta sperma dihasilkan setiap hari *Millions of sperms are formed everyday*

(ii) Terangkan peluang bagi perempuan tersebut untuk hamil jika dia berkahwin.

Explain the chances for the woman to get pregnant if she gets married.

[2 markah]

[2 *marks*]

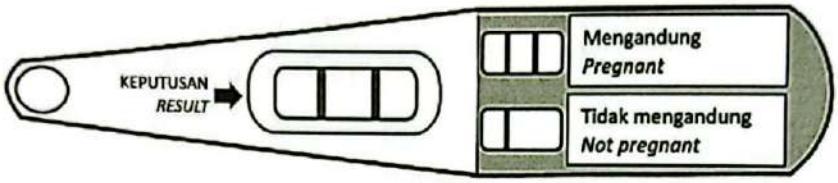
P1 Peluang hamil rendah / *Low chance of pregnancy*

P2 Tiub Fallopio tersumbat / sempit // *Blocked / Narrow Fallopian tube*

P3 Sperma tidak dapat sampai / mensenyawakan oosit sekunder
Sperma unable to reach / fertilise secondary oocyte

P4 Tiada zigot terbentuk / *No zygote is formed*

(b) Puan A yang baru berkahwin mengalami muntah-muntah, loya dan pening. Dia telah menguji air kencingnya dengan menggunakan kit kehamilan untuk mengetahui sama ada dirinya mengandung atau tidak.
Rajah 9.3 menunjukkan keputusan pada kit kehamilan tersebut yang disebabkan oleh kehadiran satu hormon di dalam urin.
Mrs. A, who has recently gotten married, is experiencing vomiting, nausea, and dizziness. She has tested her urine using a pregnancy test kit to determine whether she is pregnant or not.
Diagram 9.3 shows the result on the pregnancy test kit, which is caused by the presence of a hormone in the urine.



Rajah 9.3
Diagram 9.3

Apakah hormon tersebut? Terangkan.
What is the hormone? Explain.

[4 markah]
[*4 marks*]

P1 Hormon gonadotrofin korion manusia / HCG
Human chorionic gonadotropin / HCG

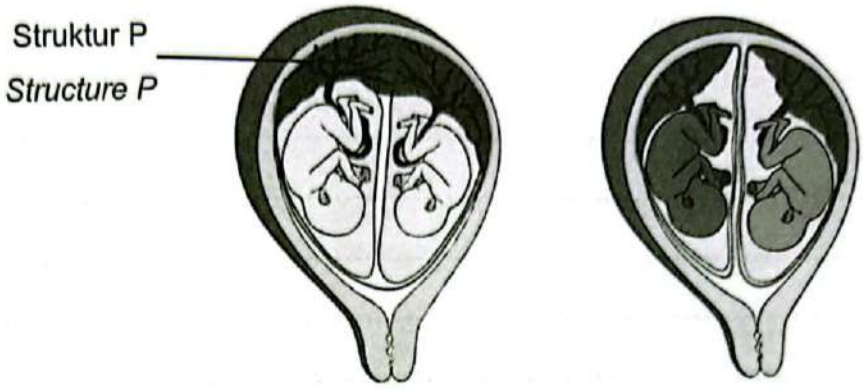
P2 Dihasilkan / Dirembeskan oleh plasenta
Produced / Secreted by placenta

P3 Aras hormon ini meningkat pada peringkat awal kehamilan
The level of this hormone increases at the early stages of pregnancy

P4 Bertambah sekali ganda setiap dua atau tiga hari sepanjang empat minggu pertama
Double every two to three days for the first four weeks of pregnancy

(c) Rajah 9.4 menunjukkan kedudukan fetus di dalam kandungan bagi dua jenis kembar yang berbeza iaitu kembar A dan kembar B.

Diagram 9.4 shows the position of the foetus in the womb for two different types of twins, namely twins A and twins B.



Rajah 9.4

Diagram 9.4

(i) Huraikan perbezaan antara jenis kembar A dan kembar B.

Describe the differences between type of twins A and twins B.

[3 markah]

[3 marks]

	Kembar A	**Kembar B**
P1	Kembar seiras *Identical twins*	Kembar tak seiras *Fraternal twins*
P2	Hasil persenyawaan satu ovum dan satu sperma *Product of fertilsation of* *one sperm and one ovum*	Hasil persenyawaan dua ovum dan 2 sperma *Product of fertilsation of* *two sperms and two ova*
P3	Membentuk satu zigot *Form one zygote*	Membentuk dua zigot *Form two zygotes*
P4	Embrio membahagi menjadi dua *Embryo divides into two*	Embrio tidak membahagi menjadi dua *Embryo does not divide into two*
P5	Satu plasenta dikongsi oleh dua fetus *One placenta is shared by two foetus*	Setiap fetus mempunyai plasenta sendiri *Each foetus has its own placenta*
P6	Kandungan genetik kembar sama *The genetic makeup of the twins* *are similar*	Kandungan genetik kembar tidak sama *The genetic makeup of the twins* *are different*
P7	Sifat fizikal kembar sama *Their physical appparances are* *similar*	Sifat fizikal kembar tidak sama *Their physical appparances are* *different*
P8	Jantina kembar sama *The sex of both twin* *is the same*	Jantina kembar sama atau berbeza *The sex of both twin* *can be the same or different*

(ii) Berdasarkan Rajah 9.4, ibu kepada kembar A mengalami tekanan darah tinggi yang menyebabkan struktur P tidak dapat berfungsi. Terangkan kesan keadaan ini kepada kehamilannya.

Based on Diagram 9.4, the mother of twins A has high blood pressure which causes structure P to be unable to function.

Explain the effect of this condition on her pregnancy.

[4 markah]

[*4 marks*]

P1 Struktur P ialah plasenta / Structure P is placenta

P2 Glukosa / asid amino / antibody / oksigen tidak dapat meresap dari darah ibu ke kapilari darah fetus //
Fetus kekurangan glukosa / asid amino / antibody / oksigen
Glucose / amino acid / antibody / oxygen cannot diffuse from mother blood into foetal blood capillaries //
Foetus lack of glucose / amino acid / antibody / oxygen

P3 Karbon dioksida/bahan buangan bernitrogen /urea tidak boleh meresap dari kapilari darah fetus ke dalam darah ibu // Karbon dioksida/urea tidak dapat disingkirkan //
Pengumpulan karbon dioksida/bahan buangan bernitrogen/urea pada fetus
Carbon dioxide / nitrogenous waste/urea cannot diffuse from foetal blood capillaries into mother blood // Carbon dioxide / nitrogenous waste / urea cannot be excreted //
Accumulation of carbon dioxide / nitrogenous waste / urea in fetus

P4 Hormon estrogen / progesteron tidak dapat dirembeskan
Hormone oestrogen / progesterone cannot be secreted

P5 Ketebalan dinding endometrium tidak dapat dikekalkan
The thickness of endometrial wall cannot be maintained

P6 Penempelan embrio sukar berlaku / Keguguran berlaku
Implantation of embryo is difficult to occur / Miscarriage occur

P7 Menyebabkan darah ibu dan darah fetus bercampur
Causes mother blood and foetus blood to mix

P8 Tidak dapat melindungi fetus dari bahan yang berbahaya / toksin/ bakteria
Cannot protect foetus from dangerous substances/ toxin / bacteria

P9 Tidak dapat menghalang salur darah fetus pecah (akibat tekanan darah ibu yang tinggi)
Unable to prevent foetal blood vessel from burst (due to the mother high blood pressure)

P10 Tidak dapat menghalang pengaglutinatan / penggumpalan darah berlaku
Unable to prevents agglutination / blood clot occurs