

**1-(A) or (B) (one mark)**

(A) The genetic code (Page 136)

(B) Reverse transcriptase (Page 144)

**2- Half for each = (one mark)**

1<sup>st</sup> - Tissue culture (Page 45)

2<sup>nd</sup> - Parthenogenesis (Page 44)

**3-(A) or (B) (one mark)**

(A) The plant stem approaches the support and grows vertically (supporting tissue) (Page 13)

(B) Destroys acetylcholine into choline and citric acid so the membrane permeability to ions returns to the resting state, it is now ready to be stimulated and respond again. (Page 18)

**4- (c) The lymph nodes (Page. 90) (one mark)**

**5- (A) or (B) (one mark)**

(A) To form four haploid cells, three of them degenerate and the fourth divides by mitosis to form new filament. (Page 48)

(B) Because the corpus luteum degenerates gradually, consequently, the secretion of progesterone stops and so the endometrium degenerates and blood vessels tear due to the successive contraction of the uterus.

(Page 67)

6-

(one mark)

1- Used to tell whether a particular gene is present in its genome and in what amount.

2- Used to determine evolutionary relationships between different species.

(Page 141)

7-

(Two Marks)

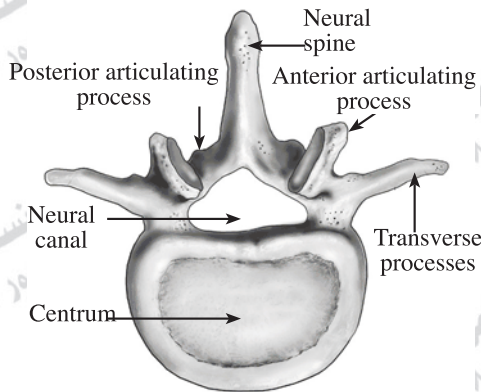
1<sup>ST</sup>) 5'.....UAC - CCC - GGC - AGG.....3'

2<sup>nd</sup>) Tyrosine - Prolines - Glycine - Arginine

(Page 137)

8-

(Page 7) (Two Marks)



9-

(Page102) (Two Marks)

1<sup>st</sup>) Engulf the antigen and digest it by its lysosomes enzymes into fragments. (½ (Mark)

2<sup>nd</sup>) To transfer the complex resulting from the binding between the antigen and the MHC to the plasma membrane of the macrophage to be presented on its outer surface. (Page 102) (one mark)

3<sup>rd</sup>) Lymphocytes does not recognize this antigen. (½ (Mark)



10-(A) or (B)

(one mark)

(A)Angiospermae

(Page 52)

(B) Phase of proliferation

(Page 67)

11- The bacterial transformation will stopped and the group of mice will still alive. (Page 113- 114) (one mark)

12- c) Meiosis and mitosis.

(Page 54) (one mark)

13- Identical (monozygotic) twins

(Page 73) (one mark)

14-

(Page 57) (one Mark)

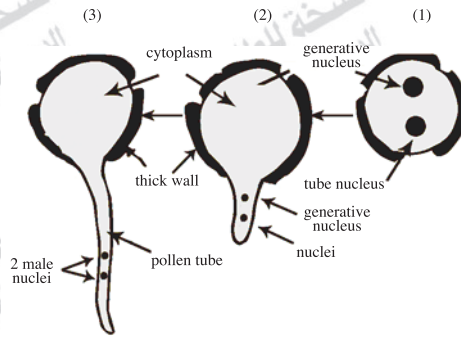
Endospermic seeds	Non-endospermic seeds
In which the integuments of the ovary and ovule fuse together forming a single seeded fruit called grain	In these plants they store food in the cotyledons, hence these seeds are called two cotyledons seeds, where the integuments of the ovule harden forming the seed testa, it is called (seed) as in bean and pea seeds.

15-The body will use a 3<sup>rd</sup> line of defense that included lymphocytes called; acquired immunity (specific or adaptive immunity)

(Page 101) (one Mark)

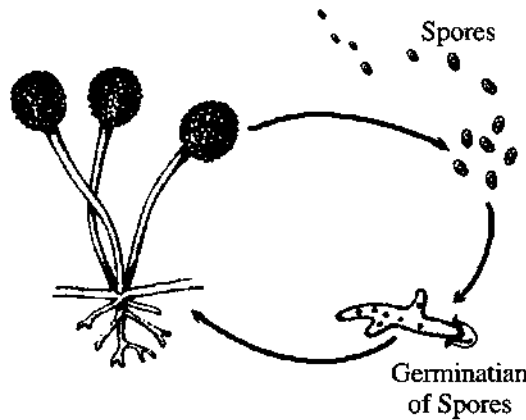
16- (A) or (B)

(Two Marks)



(A)

(Page 56)



(B)

(Page 44)

17-

(Two Marks)

1<sup>st</sup>) Curve (B) muscle fatigue & curve (C) muscle spasm

(Page 19-20) (one mark)

2<sup>nd</sup>) The muscle still in the case of contraction and can't relax due to the shortage of ATP in the muscle leads to prevent the separation of the transverse links from the action filaments that causing painful muscle spasm.

(Page 19-20) (one mark)

18-

(Page 127) (Two Marks)

1<sup>st</sup>) This change in DNA molecule leads to gene mutation.

(one mark)

2<sup>nd</sup>) Yes,

(½ (Mark)

- Protein will be formed but differ from that wanted or no,

If the AUG is a start codon.

- The playpeptide chain will not be formed due to absence of start codon.

(½ (Mark)



19-(A) or (B)

(one mark)

(A) A strong connective tissue that link the muscles with bones at the joints

(Page 12)

(B) The membrane which surrounds the sarcoplasm.

(Page 16)

20-

(b) Major histocompatibility complex

(Page 102) (one mark)

21-

When merozoites infect the red cells they pass several cycles they produce huge numbers of merozoites that are released together every 2 days with the destruction of infected red blood cells and formation of toxic substances.

(Page 49) (one mark)

22- Be lethal and cause miscarriage.

(Page 128) (one mark)

23- Lymphokines

(Page 105) (one mark)

24-

(one mark)

1<sup>st</sup> - Formation of drones

(Page 44)

2<sup>nd</sup> - Tobacco plant – carrot

(Page 45)

25- (A) or (B)

(Two Marks)

(A)

Neutralization	Agglutination
<p>The antibodies bind to the outer coats of the viruses , this binding will prevent the viruses from adhering to the membranes of the host's cells and from spreading or pass to inside them (Page 97)</p>	<p>Some antibodies has many antigen-binding sites, which enable each of them to bind to more than one microbe, this leads to the clumping of microbes on the same antibody to be engulfed by phagocytes. (Page 97)</p>

(B)

Getting rid of toxins in plants	Getting rid of toxins in human
<p>Plants produce some enzymes known as detoxifying enzymes, where these enzymes interact with the toxins produced by pathogens and invalidate their toxicity. (Page 88)</p>	<p>Antibodies can bind to toxins and form complexes of antibodies and toxins these activate the complements to react with them in a chain reaction which leads finally to detoxifying them. (Page 98)</p>



26-

(Page 127) (Two Marks)

1st)

UAG   GAG  
A                      B

2<sup>nd</sup>) Changing the type of amino acid that is lead to change of protein

3<sup>rd</sup>) RNA polymerase

27-

(Page 28) (Two Marks)

Its effects on	LH	FSH
Male	The formation and secretion of interstitial cells in the testes for complete the sexual maturity of individual.	The formation of the seminiferous tubules and spermatozoa in testes
Female	Stimulates the formation of corpus luteum for complete the sexual maturity of individual.	The growth of the ovarian follicles and formation of grafian follicles

**28- (A) or (B) (one mark)**

(A) Cartilage (Page 10)

(B) Acetylcholine (Page 17)

**29- (A) or (B) (one mark)**

(A) Sticky disc at the end of the style in carpels – Where pollen grain adhere. (Page 53)

(B) On one side of the body of Hydra – forming a bud. (Page 42)

**30- (A) or (B) (one mark)**

(A) Overgrowth of the protoplast of adjacent living parenchymatous cells which protrude into xylem vessels and tracheid through pits. (Page 86)

(B) The gum secreted within the cells surrounding the locus of infection to prevent the entry of microbes inside the plant (Page 87)

**31- (b) maturation (Page 61) (one mark)**

**32-**

To destroy microbes in blood after their conjugation with antibodies, they lyses the membranes of antigens and dissolve their content, which makes them easily engulfed by phagocytes. (Page 94) (one mark)

33-

The double strands of DNA were not separated as a result of breaking the hydrogen bonds between the paired (stopping the DNA replication).

(Page 120) (one mark)

34-

(Page 64) (Two Marks)

1<sup>st</sup>) 10 days

(½ Mark)

2<sup>nd</sup>) (2) Estrogen & (3) Progesterone

(½+ ½ = 1 Mark)

3<sup>rd</sup>) Haploid or (N) or (23 chromosomes)

(½ Mark)

35-

1- Hormones of the Adenohypophysis (anterior lobe)

Prolactin: stimulates milk secretion from mammary glands. (Page 28)

2- Hormones of the neurohypophysis (posterior lobe)

Oxytocin: stimulates the release of milk from mammary glands as a response of lactation. (Page 29) (Two Marks)

36-

(Page 121) (Two Marks)

1<sup>st</sup>) 5'....AUG - AAU - UCG - UAA..... 3'

2<sup>nd</sup>) 3 - AUG = Methionine

(Page 137)



37- The muscle still in a contraction state and leads to muscle fatigue.  
Or the muscle does not contract if it is in rest state .

(Page 19) (one mark)

38- d) Histamines.

(Page 100) (one mark)

39-(A) or (B) (one mark)

(A) It can transfers the drugs, harmful substances such as alcohol, nicotine, viruses from mother's blood to the embryo which cause great harms, serious deformities and diseases to the embryo. (Page 69)

(B) If the age decrease or exceeds that range, both the mother and the embryo will be subjected to serious problems, moreover, the possibility to produce deformed babies will increase. ( Page 71)

40- Both whorls are called perianth

(Page 53) (one mark)

41- Mobile macrophages

(Page 94) (one mark)

42-

(Page 29) (one mark)

Increasing in the reabsorption of water in nephrons and decreasing the volume of urine excreted. In addition, it increase blood pressure and stimulating the release of milk from mammary as a response of lactation.

43- (A) or (B)

(Two Marks)

(A)

Lysis	Precipitation
The binding between antibodies and antigens activates specific proteins and enzymes called complements to lyse the coats of antigens and dissolve their content which makes them easily engulfed by phagocytes. (Page 98)	Binding between antibodies and soluble antigens leads to the formation of insoluble antigen-antibody complexes which form a precipitate to facilitate its engulfing by phagocytes. (Page98 )

(B)

B-cells	T - cells
Production: in red bone marrow. Maturation: in the bone marrow (Page 92)	Production: in red bone marrow . Maturation: in the thymus gland. (Page 92)



44-

(Two Marks)

1st) DNA duplication - each new cell receives a complete copy of the original cell's genetic information. (Page 121)

2nd) Adding new nucleotides to the 3' end for the new strand.

If strands remain undamaged the repair enzymes can use it as a template to replace a damaged segment in its partner. (Page 122)

45-

(Page 62) (Two Marks)

The head: It contains the nucleus with 23 chromosomes. There is an acrosome in the forehead which secretes the hyaluronic enzyme that dissolves a part of the ovum membrane, to facilitate its penetration process.

The neck: It contains two centrioles which play an important role in the fertilized ovum division