



**JABATAN PELAJARAN KELANTAN
JALAN DOKTOR, 15000 KOTA BHARU.**

TRIAL EXAMINATION

2012

BIOLOGY (BIOLOGI)

SIJIL TINGGI PERSEKOLAHAN MALAYSIA

(MALAYSIA HIGHER SCHOOL EDUCATION)

PAPER 1 (KERTAS 1)

MULTIPLE-CHOICE (ANEKA PILIHAN)

One hour and forty-five minutes (Satu jam empat puluh lima minit)

Instructions to candidates:

DO NOT OPEN THIS BOOKLET UNTIL YOU TOLD TO DO SO

*There are **fifty** questions in this paper. For each question, four suggested answers are given. Choose **one** correct answer and indicate it on the multiple-choice answer sheet provided.*

Read the instructions on the multiple-choice answer sheet very carefully.

*Answer **all** questions. Marks will not be deducted for wrong answers.*

Arahan kepada calon :

**JANGAN BUKA BUKU SOALAN INI SEHINGGA ANDA DIBENARKAN BERBUAT
DEMIKIAN**

*Ada **lima puluh** soalan dalam kertas ini. Bagi setiap soalan, empat cadangan jawapan diberikan. Pilih **satu** jawapan yang betul dan tandakan jawapan itu pada helaian jawapan aneka pilihan yang dibekalkan.*

Baca arahan pada helaian jawapan aneka pilihan itu dengan teliti.

*Jawab **semua** soalan. Markah tidak akan ditolak bagi jawapan yang salah.*

This question paper consists of 16 printed pages

(Kertas soalan ini terdiri daripada 16 halaman bercetak)

Section A

Four suggested answers labeled **A**, **B**, **C**, and **D** are given for each question. Choose **one** correct answer.

- Which of the following properties of water are important for the temperature regulation in mammals?
 - High latent heat of vaporisation
 - Highest density at 4°C
 - High heat capacity
 - High surface tension

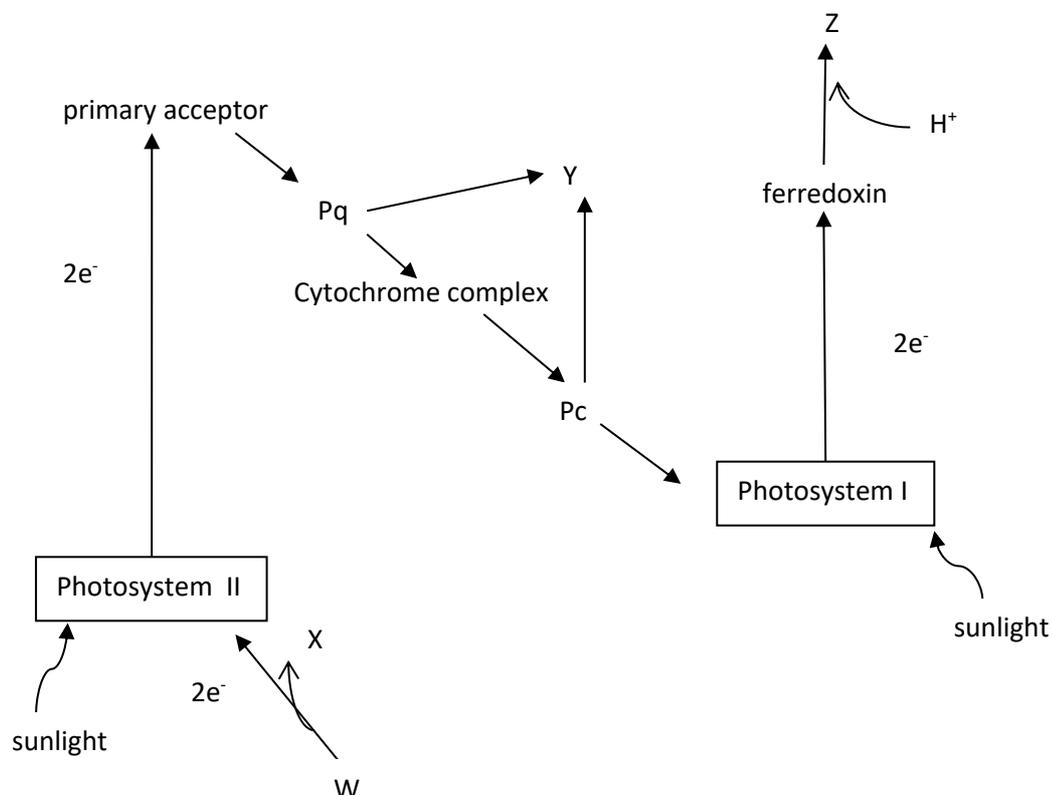
A I and II
B I and III
C I and IV
D II and IV
- Proteins can function as a buffer because
 - proteins contains peptide bonds
 - proteins are non-polar molecules
 - proteins are soluble in water
 - proteins are amphoteric molecules
- Saturated fatty acids differ from unsaturated fatty acids in
 - the presence of double covalent bond in the fatty acids
 - the physical condition of the fatty acid at room temperature
 - the number of oxygen atoms in the fatty acids
 - the branching or linear shape of the fatty acids
- Which of the following is correct for the components and their functions?
 - Lecithin – acts as a receptor to molecules such as hormone
 - Cholesterol – maintain the fluid characteristic of the membrane
 - Smooth endoplasmic reticulum – detoxification in liver cells
 - Phloem – translocation of organic products of photosynthesis

A I and II
B II and IV
C I, II and IV
D II, III and IV
- Which of the following structure is usually found in animal cells?
 - Lysosome
 - Plastids
 - Microtubules
 - Centrioles

A I and II
B I and III
C I and IV
D I, III and IV

6. Which of the following statements are **true** about non-competitive inhibitors?
- I Bind temporarily on the active site of the enzyme
 - II Reduce the K_m value only if the substrate concentration is low
 - III The K_m value of the enzyme remains the same
 - IV Cyanide is the example of a non-competitive inhibitor
- A I and II
B I and IV
C III and IV
D II, III and IV
7. Which of the following is not a stop codon?
- A UAA
B UGA
C UAG
D AUG
8. What are the advantages of light independent process in C_4 compared to C_3 plants?
- I In the bundle sheath cells, the effectiveness of RuBP carboxylase is increased
 - II PEP carboxylase has higher affinity towards carbon dioxide compared to RuBP carboxylase
 - III The first product of the light independent process in C_4 is a four carbon molecules
 - IV Increases photorespiration
- A I and II
B I and IV
C II and III
D I, II and IV

9. The following diagram shows a scheme for the light reaction of photosynthesis.



Which of the following substances are represented by W, X, Y and Z in the scheme?

	W	X	Y	Z
A	NADP	ADP	ATP	O ₂
B	ADP	ATP	O ₂	NADPH
C	H ₂ O	O ₂	ADP	NADPH
D	H ₂ O	O ₂	ATP	NADPH

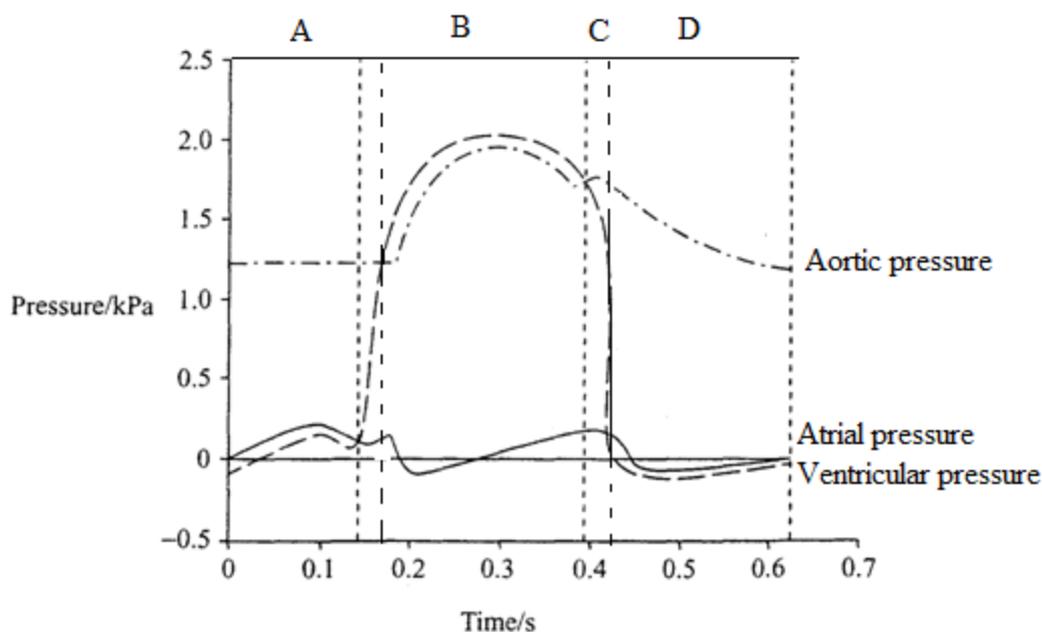
10. What will become of all carbons from a glucose molecule after it is completely oxidised?

- A** Pyruvate
- B** Carbohydrate
- C** Carbon dioxide
- D** Acetyl coenzyme A

11. Which of the following statements are true about anaerobic respiration in plants?

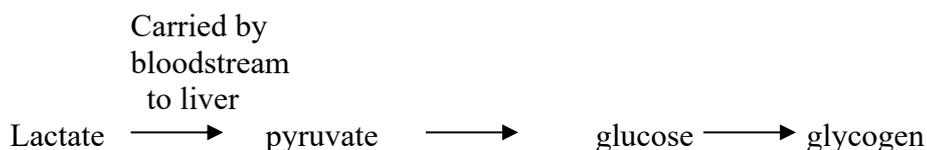
- I 2 ATP are produced
 - II 4 ATP are produced
 - III The end product are ethanol and carbon dioxide
 - IV NADH is used in the reduction of pyruvate
- A** I and IV **B** II and III
C II, III, and IV **D** I, III and IV

12. Which of the following is a hydrogen donor in the biosynthesis of purple sulphur bacteria and green sulphur bacteria?
- Water
 - Hydrogen sulphide
 - NADH
 - Hydrocarbon compound
13. Changes of hydrogen ion concentration in cerebrospinal fluid in the brain is detected by the
- peripheral chemoreceptor
 - central chemoreceptor
 - aortic body
 - carotid body
14. In Bohr's effect, the affinity of haemoglobin towards oxygen is reduced because
- haemoglobin acts as pH buffer in erythrocytes
 - high concentration of CO_2 altered the shape of haemoglobin
 - ferum ion in haemoglobin is attracted to chloride ions that diffuses into erythrocytes
 - the concentration of carbamino-haemoglobin increases in erythrocytes
15. The pressure changes in the aorta, left ventricle and left atrium are shown in the graph below. In which of the following segments A, B, C or D, is the semilunar valve of aorta open?



16. Which of the following statements about transpiration pull is true?
- It is an energy dependent process.
 - It is caused by evaporation of water molecules through the stoma.
 - It is affected by relative density of atmosphere.
 - It involves the movement of water molecules from vessels into the atmosphere.
- II and III
 - III and IV
 - II, III and IV
 - I, II, III and IV

17. The main function of a stoma to
- A respond to the environmental stress
 - B allow the diffusion of gas into the mesophyll cell
 - C allow the diffusion of gas while regulating water loss
 - D regulate the movement of water during transpiration
18. What the is the name given to the route taken by lactate produced in the skeleton muscle to liver where it is converted into glucose ?



- A Calvin Cycle
 - B Cori Cycle
 - C Krebs Cycle
 - D Hatch-Slack Cycle
19. Which of the following is the effect of ADH on nephrons?
- A Increase the permeability of the proximal convoluted tubule to water
 - B Increase the permeability of the proximal convoluted tubule to Na^+ ions
 - C Increase the permeability of the distal convoluted tubule to water
 - D Increase the permeability of the distal convoluted tubule to Na^+ ions
20. The following table shows the concentration of the main ions inside and outside of the nerve cell during resting potential.

Ion	Concentration in the cell mol dm ³	Concentration outside cell mol dm ³
Na^+	15	150
Cl^-	10	110
K^+	150	5

What would happen when the nerve receives the correct stimulus ?

- A Na^+ ions will enter the cell
- B K^+ ion will enter the cell
- C Na^+ ion will leave the cell
- D Na^+ and Cl^- ions will enter the cell

21. Which of the following are the functions of the synapse
- I To connect two neurons
 - II To act as the impulse inhibition site
 - III To increase the rate of propagation of impulse
 - IV To prevent excessive stimulation through the fatigue process
- A I and II
B I and IV
C II and III
D III and IV
22. Cocaine increases the amount of dopamine in synaptic cleft by
- A binding to receptor sites on postsynaptic membrane
 - B binding to transporter protein that returns dopamine into presynaptic neurone
 - C preventing action of hydrolytic enzymes on dopamine in synaptic cleft
 - D binding to dopamine to increase its activity
23. Which statement is true about the role of progesterone in the menstrual cycle?
- A Stimulates the development of Graafian follicle
 - B Causes ovulation
 - C Stimulates the remaining part of the Graafian follicle to develop into the corpus luteum
 - D Maintain the thickness of the endometrium
24. Green bananas change colour when expose to the hormone
- | | |
|----------------|--------------|
| A Absisic acid | B Auxin |
| C ethylene | D cytokinine |

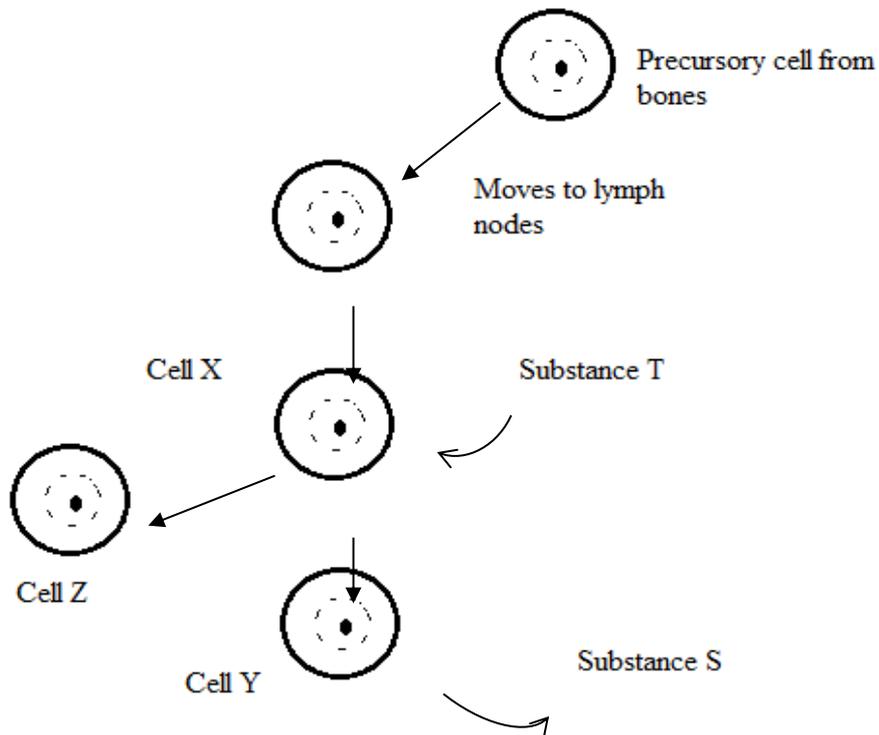
25. The table below shows several plant hormones and their roles

<i>Hormone</i>	<i>Role of hormone</i>
I Gibberellic acid	(a) To stimulate the transportation of nutrients from the leaves to other parts of the plant
II Cytokinin	(b) To stimulate the closing of stomata under physiological stress
III Auxin	(c) To stop the growth of the adventitious root
IV Abscisic acid	(d) As a fruit ripening agent
V Ethene	(e) To stimulate cell division of the lateral cambium during secondary growth

Which of the following is correct for the hormones and their roles?

- | | | | | | |
|----------|-----|-----|-----|-----|-----|
| | I | II | III | IV | V |
| A | (c) | (a) | (e) | (b) | (d) |
| B | (a) | (c) | (e) | (b) | (d) |
| C | (b) | (c) | (a) | (e) | (d) |
| D | (b) | (a) | (c) | (e) | (d) |

26. The diagram below shows the immune response in human body



Which statement about the diagram is true?

- A Cell X excretes lymphokine, then divides to form cells Y and Z in the presence of Substance T.
- B Cell Z responds quickly towards the repeated infection of a particular disease.
- C Cell Y prepares other lymphocytes to produce antibodies.
- D Substance S regulates lymphocytes involved in the immune response.

27. Which of the following are true of B cell?

- I It forms immunity through the humoral response.
- II It forms immunity through the cell mediated mechanism.
- III It is produced and it achieves maturity in the bone marrow.
- IV It is produced in the bone marrow and it achieves maturity in the thymus gland.

Which of the following is correct for the hormones and their roles?

- A I and III
- B I and II
- C II and IV
- D III and IV

28 The table below shows three animals and its way of reproduction.

<i>Animal</i>	<i>Way of reproducing</i>
I Rat	(a) External fertilisation
II Frog	(b) Partenogenesis
III Bee	(c) Viviparity

Which of the following is correct match for the ways of reproduction?

- I II III
A (c) (b) (a)
B (a) (b) (c)
C (c) (a) (b)
D (b) (a) (c)

29 The table below shows three organs and the germinal layers that formed them.

<i>Organ</i>	<i>Germinal layer</i>
I Spinal cord	(a) Endoderm
II Kidney	(b) Mesoderm
III Liver	(c) Ectoderm

Which of the following is correct match for the above three organs and germinal layers that formed them?

- I II III
A (a) (c) (b)
B (b) (a) (c)
C (b) (c) (a)
D (c) (b) (a)

30. If a diploid state is represented by D and a haploid state is represented by H, which of the following is the correct match for the number of chromosome to the parts of plant structures.

	<i>Polar nucleus</i>	<i>Tube nucleus</i>	<i>Anther</i>	<i>Cell of pericarp</i>	<i>Cell of testa</i>
A	D	D	H	D	D
B	D	H	H	D	H
C	H	D	H	H	H
D	H	H	H	D	D

- 31 Which class of organism displays an intermittent growth pattern?
- A Insecta
 - B Mammalia
 - C Reptilia
 - D Amphibia
- 32 Which of the following pairs of parents can produce children with O blood group?
- I A x B
 - II A x O
 - III AB x O
- A I and II
 - B I and III
 - C II and III
 - D I,II and III
- 33 What is allele frequency?
- A It is all the alleles at all gene loci in all individuals of the population.
 - B It is the frequency of each genotype in the population.
 - C It is the proportion of the total of a certain allele to the total number of all the alleles in the gene pool.
 - D It is the proportion of an allele to the total number of phenotypes in the gene pool.
- 34 In a population of cows at genetic equilibrium, 750 cows have dominant grey coat, while the remaining 250 cows have recessive white coat. What is the number of cows with heterozygous genotype?
- A 250
 - B 500
 - C 750
 - D 1000

35 The cystic fibrosis ailment on the pancreas is a condition of recessive homozygous. If one in every 2000 individuals in a population suffers from this ailment, what is the frequency of the gene in that population?

- A 0.005
- B 0.001
- C 0.022
- D 0.044

36 The following are the enzymes produced in *Escherichia coli*

- I transacetylase
- II *B*-galactosidase
- III lactose permease

Which of the following is the correct match between the structural genes and the enzymes that they code?

	Lac Z	Lac Y	Lac A
A	II	III	I
B	I	II	III
C	III	I	II
D	I	III	II

37 What are inducible enzymes?

- A Enzymes that are constantly synthesized and are not dependent on the presence of inducers.
- B Enzymes that are regularly produced but can be turned off in the presence of repressors.
- C Enzymes synthesized in the presence of specific molecules called inducers.
- D Enzymes that are regularly produced but can be turned off in the presence of corepressors.

38 Which of the following sequences can form a palindrome?

A GGCATC

B GGCGCC

C GGCCGG

D GGGCCC

39 The following shows the steps taken during a DNA fingerprinting process.

I DNA treated with endonuclease.

II Fragments separated by gel electrophoresis.

III Radioactive probes with complementary base sequence are added.

IV Exposed to X-ray film.

The correct sequence of the steps above is

A III, I, II, IV

B I, II, III, IV

C II, I, IV, III

D I, II, IV, III

40 Which of the following are the examples of transgenic organism?

I *Pseudomonas* bacteria strain that can break down hydrocarbons

II Sheep that produces milk with human growth hormone

III *Rhizobium* bacteria in root nodules that have the ability to fix nitrogen

IV Plants that are resistant to glyphosate

A I, II and III

C II, III and IV

B I, II and IV

D I, II, III and IV

- 41 Which of these is the importance of limitation enzyme action in the technology of DNA recombinant?
- A Limiting the cDNA cloning
 - B Uniting the chromosome and the plasmid
 - C Ensuring the randomization of the cutting of DNA sequence
 - D Ensuring the inter complimentaries of the ends of source DNA fragment and DNA plasmid
- 42 Taxonomist took out *Mucor* from the kingdom plantae and put it under the kingdom Fungi because
- A *Mucor* is mycelial
 - B *Mucor* is heterotropic
 - C *Mucor* reproduces by means of spores production
 - D *Mucor* does not produce flowers, seeds, or fruits

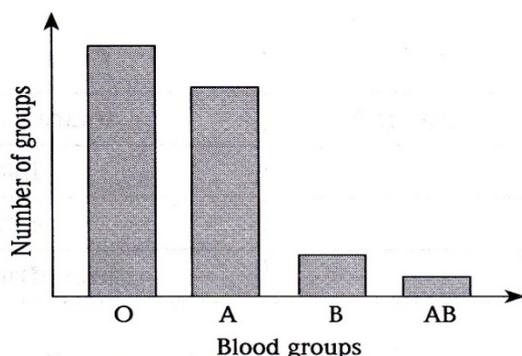
43 The table below shows four organisms and their specific structures

<i>organisms</i>	<i>Specific structures</i>
I Pheretima	(a) Setae
II Euglena	(b) Radula
III Penaeus	(c) Chloroplast
IV Helix	(d) Telson

Which of the following is correct for the organisms and their specific structures?

- | | | | | |
|----------|-----|-----|-----|-----|
| | I | II | III | IV |
| A | (a) | (c) | (d) | (b) |
| B | (b) | (a) | (c) | (d) |
| C | (b) | (d) | (c) | (a) |
| D | (d) | (a) | (b) | (c) |
- 44 Two plants which belong to different families must also belong to different
- A Phyla
 - B Classes
 - C Order
 - D Genera
- 45 Which of the following characteristics is common to both echinoderms and chordates?
- A The embryo undergoes radial cleavage
 - B The gametes are produced by meiosis
 - C They are triploblastic
 - D They reproduce sexually only

46 The diagram below shows the distribution of human blood groups in a population

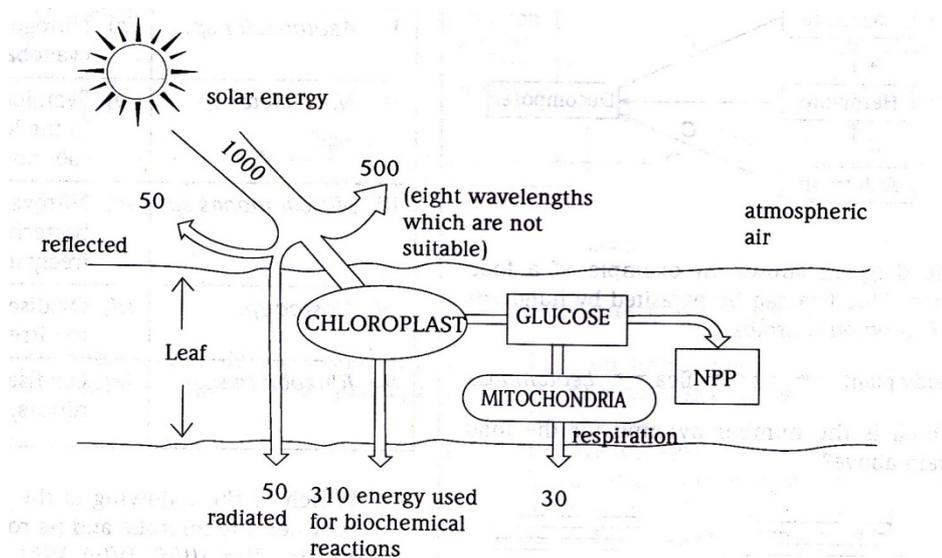


- A – blood group A
- B – blood group B
- AB – blood group AB
- O – blood group O

Human blood group is an example of

- A continuous variation
- B discontinuous variation
- C extrinsic isolation
- D intrinsic isolation

47



NPP – Net Primary Productivity

The diagram represents the gain and loss of energy (arbitrary unit) between one leaf and the air atmosphere. Based on the data given, the Net Primary Production is

- A 30 units
- B 60 units
- C 90 units
- D 270 units

- 48 The strongest competition between the different species occurs if they reside in the same
- A Biome
 - B Habitat
 - C niche
 - D community
- 49 The total product or biomass of an organism is determined by the nutrients or resources that exist in minimum concentration as compared to other resources that needed. Which of the following correctly explains the above statement?
- A Hardy-Weinberg Law
 - B Gause Law
 - C Liebig's Law
 - D Shelford's Law
- 50 The table below shows the data that is obtained from the capture-recapture technique for a population of grasshoppers in field

sample	Number
Number of grasshoppers captured, marked and released in the first capture	120
Number of grasshoppers captured in the second capture	60
Number of marked grasshoppers recaptured	40

What is the estimated grasshopper in that field?

- A 20
- B 80
- C 140
- D 180