Name : …… NRIC : ……

JABATAN PELAJARANTERENGGANUJABATANPELAJARAN TERENGGANUJABATANPELAJAR
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TRIAL
STPM 2009

JABATAN PELAJARAN
NEGERI TERENGGANU

BIOLOGY
PAPER 1

One hour and forty-five minutes

Instructions to candidates :

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE 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.The total score for this paper is the number of correctly answered questions.*

This question paper consists of 16 printed pages.

1 Which molecule is made up of or contains glucose molecules?

A Fructose
B Cellulose
C Ribonucleic acid
D Deoxyribonucleic acid

2 Which statement **best** explain the polarity of water?

A The angle between hydrogen atoms is 104.3°.
B Oxygen is more electronegative than hydrogen.
C Hydrogen is covalently bonded to oxygen to form water.
D Polar compounds with partial charges tend to dissolve in water.

3 Which organelle, in an animal cell, is spherical in shape and bounded by a single membrane?

A Lysosome
B Ribosome
C Microbody
D Mitochondrion

4 Which of the following is **most** important function of epithelium tissue?

A Secretion
B Protection
C Absorption
D Transportation

5 Which statement is **true** of transcription?

A It begins with ATG and ends with TAG.
B The sense strand is used as a template.
C The DNA polymerase is used to synthesis DNA.
D It uses 70s ribosome in prokaryote and 80s ribosome in eukaryote.

6 Which statement is **true** of non-competitive inhibitor ?

A Its mode of action is reversible.
B It binds directly to enzyme at the active site.
C Its binding to enzyme lowers the activation energy.
D Its inhibitory effect can be reduced by increasing the substrate concentration.

7 Which plants that Rubisco binds with both carbon dioxide and oxygen ?

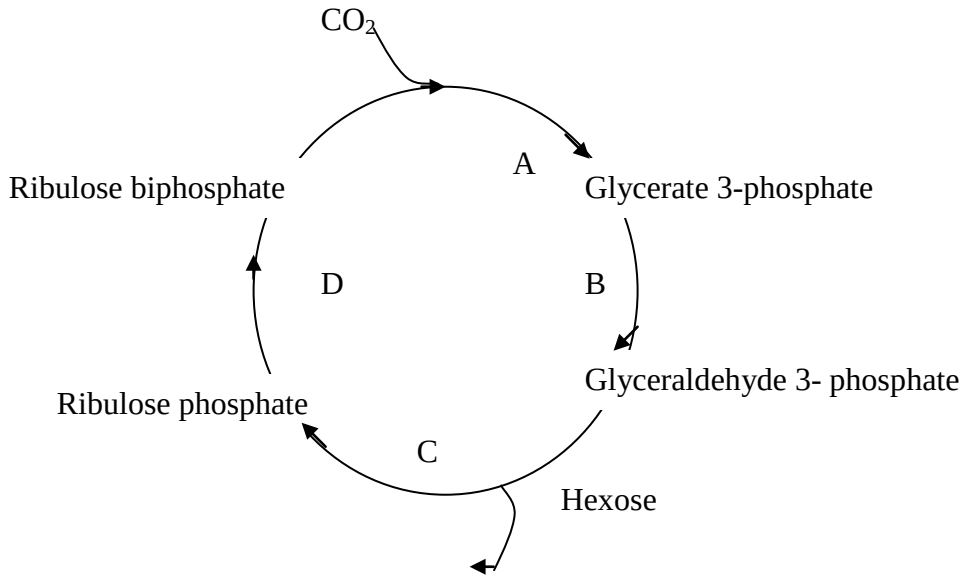
A C_3 plants
B C_4 plants
C CAM plants
D C_4 and CAM plants

8 The rate of photosynthesis of a fresh water plant is measured by different colours spectra. Which of the following is the correct order of colour that gives an increasing rate of photosynthesis?

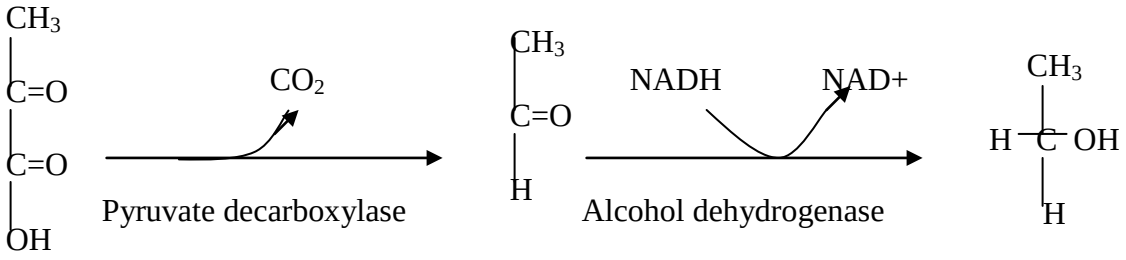
A Blue- Red-Orange-Yellow-Green
B Blue-Green-Yellow-Orange-Red
C Green-Yellow-Orange-Red-Blue
D Green -ed-Blue-Yellow-Orange

9 Which of the following molecules contains the most energy?

A ATP
B Glucose
C Sucrose
D Starch



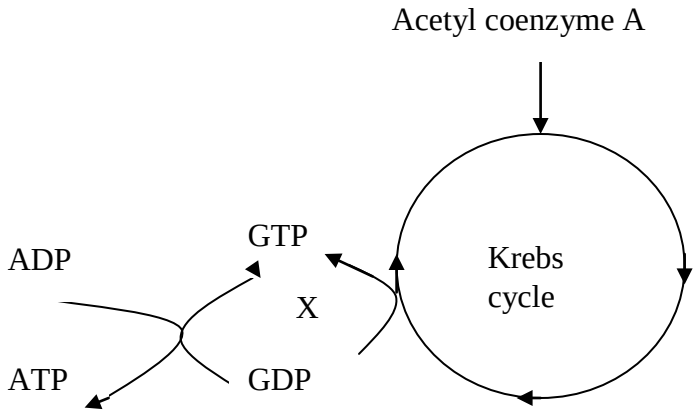
10 The diagram above shows the stages in the dark reaction. At which stage is the reduced NADP reoxidised?



Pyruvate Acetaldehyde Ethanol

11 The diagram above shows the conversion of pyruvate to ethanol during anaerobic respiration. Which of the following allows glycolysis to continue?

A The regeneration of NAD^+
B The regeneration of NADH
C The release of carbon dioxide
D The addition of yeast to ethanol

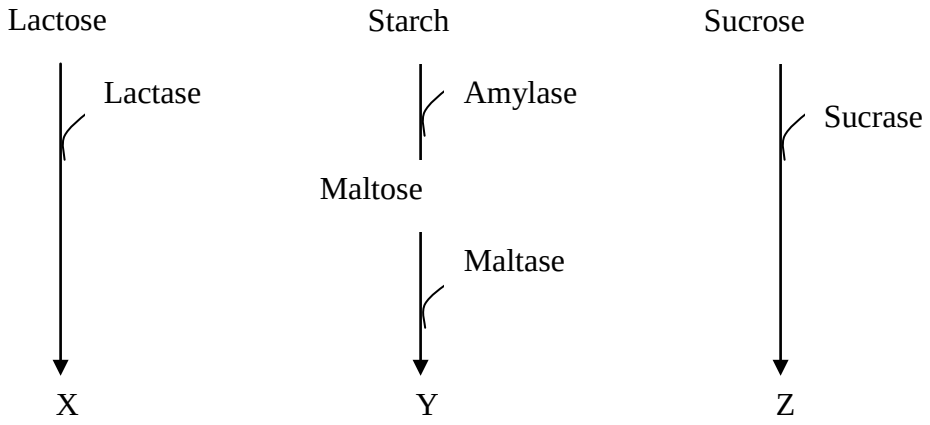


12 The diagram above shows the Krebs cycle. What is process X ?

A Phosphorylation
B Oxidation of GTP
C Oxidative Phosphorylation
D Substrate level phosphorylation

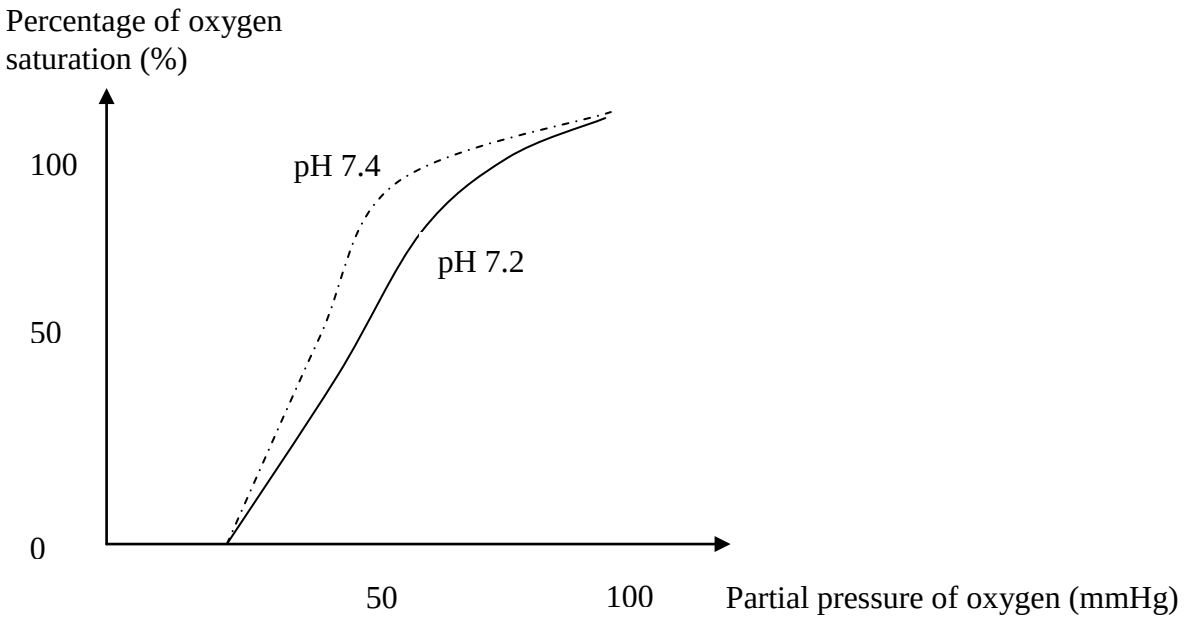
13 Which is an example of saprophytic organism?

A Mucor sp.
B Taenia sp.
C Rafflesia sp.
D Periplenata sp.



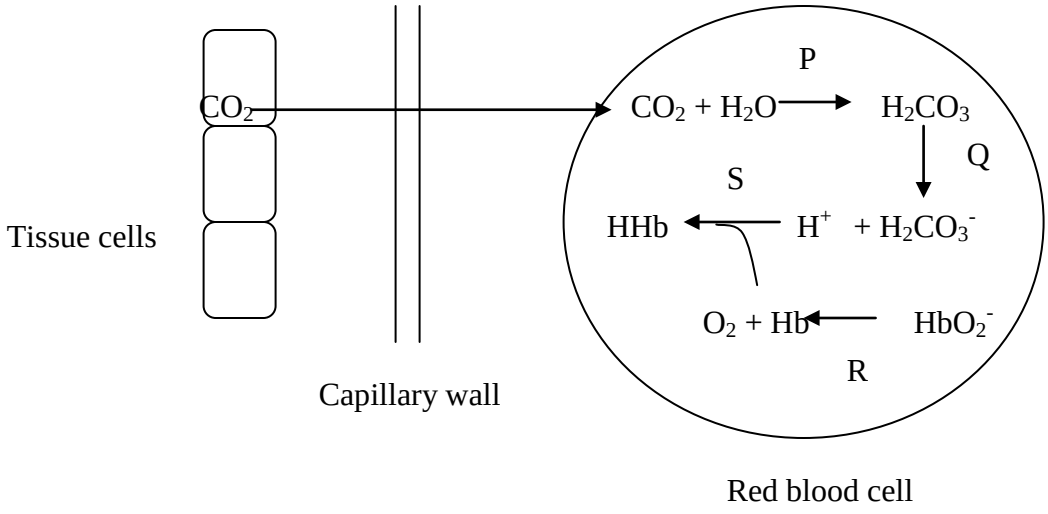
14 The diagram above shows the digestion of lactose, starch and sucrose. What are the substances X,Y and Z?

	X	Y	Z
A	Glucose and glucose	Glucose and fructose	Glucose and galactose
B	Glucose and fructose	Glucose and galactose	Glucose and glucose
C	Glucose and galactose	Glucose and fructose	Glucose and glucose
D	Glucose and galactose	Glucose and glucose	Glucose and fructose



15 The graph above shows the oxygen dissociation curves for two values of pH. Which statement about the curve is **true**?

A The increase in pH is due to vigorous activities.
B The increase in pH causes the curve to shift to the right.
C The percentage of oxygen-saturated haemoglobin decreases when pH increases.
D The shifting of the curve to the right is due to an increase in concentration of blood carbon dioxide.



16 The diagram above shows the diffusion of carbon dioxide from respiring cells into the blood involving steps P,Q,R and S. Which step requires carbonic anhydrase to proceed to the next?

A P
B Q
C R
D S

17 What is the volume of air that can be forced out following the deepest possible inspiration?

A tidal volume
B vital capacity
C residue volume
D expiratory reserve volume

18 Which response occurs when a person loses a lot of blood?

A A decerase in renin secretion
B An increase in the secretion of sodium ions
C An increase in the production of angiotensin
D A decrease in the production of aldosterone

19 Which condition causes the closing of a stoma?

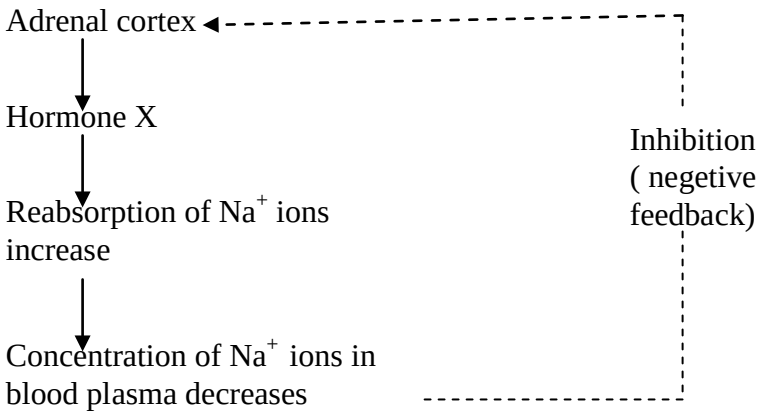
A The influx of potassium ions into the guard cells
B The increase in the concentration of glucose in the guard cells
C The decrease in the concentration of carbon dioxide in the guard cells
D The increase in the concentration of absicisic acid when plants are exposed to stress

20 The biochemical pathway which converts lactate into glucose and later into glycogen in the liver is as follows.

Lactate ⟶ Pyruvate ⟶ glucose ⟶ glycogen

What is the pathway known?

A Cori cycle
B Krebs cycle
C Calvin cycle
D Ornithine cycle



21 The diagram above shows the control of sodium ions level in the blood plasma. What is hormone X?

A Adrenaline
B Aldosterone
C Angiotensin
D Antidiuretic

22 Which of the following **correctly** explains the distribution of ions on either side of the membrane of an axon in its resting state?

A A high concentration of organic anions outside and a low concentration of K^+ ions inside.
B A high concentration of organic anions inside and a low concentration of Na^+ ions outside.
C A high concentration of K^+ ions and organic anions outside and a high concentration of Na^+ ions inside.
D A high concentration of Na^+ outside and a high concentration of K^+ ions and organic anions inside.

23 Where are the receptor sites for neurotransmitters situated?

A nodes of Ranvier
B presynaptic membrane
C postsynaptic membrane
D membrane of the synaptic vesicles

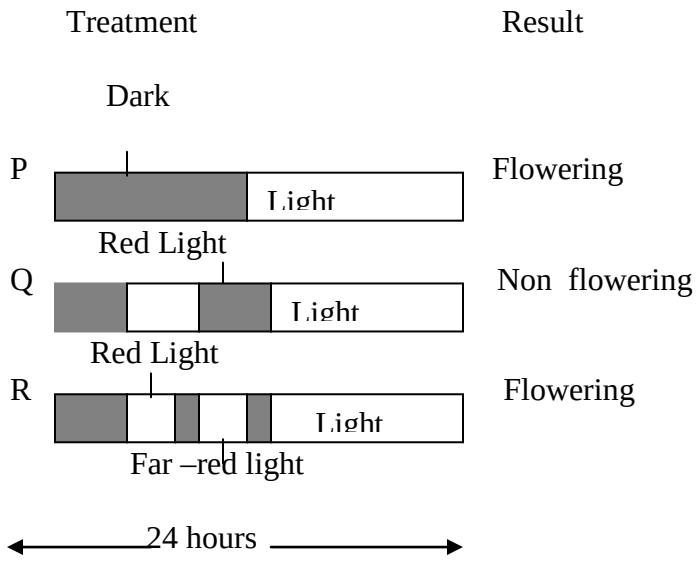
24 Which statement is **not true** of auxin?

A It stimulates the division of cell in a stem.
B It stimulates the elongation of coleoptile.
C It promotes the formation of lateral shoot.
D It inhibits the elongation of root at the high concentration.

25 Oestrogen and progesterone are used in contraceptive pills. What is the effect of this hormones on mestrual cycle?

A Its maintain the endometrium of the uterus.
B Its stimulate the release of luteinising hormone.
C Its inhibit the production of gonadotropic hormones.
D Its stimulate the release of folicle stimulating hormone.

26 The diagram below shows the findings of an experiment on the effect of light on the flowering of a plant.

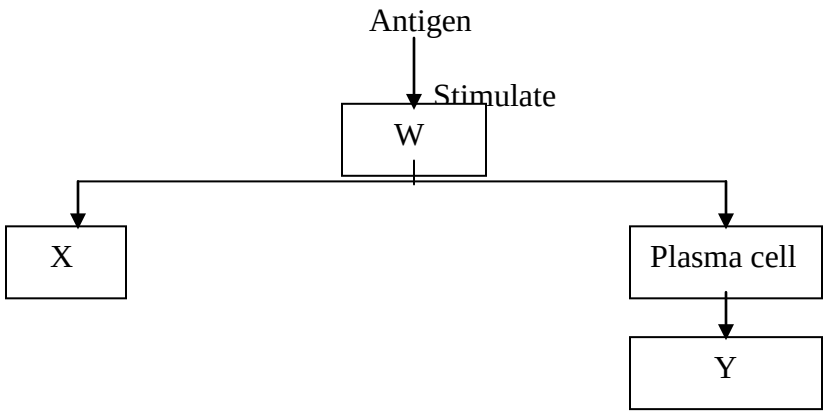


Which of the following are **true** of the plant?

I The plant is a long day plant.
II The plant is a short day plant.
III Far-red light cancels off the action of red light.
IV Red light can replace the requirement of dark period.

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

27 What do *W,X* and *Y* represent in the following simplified flow chart of the humoral response?



	W	*X*	*Y*
A	B cell	Memory B cell	Antibody
B	B cell	Antibody	Memory B cell
C	T cell	Memory T cell	Helper T cell
D	T cell	Memory T cell	Cytotoxic T cell

28 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

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

29 Which of the following is **true** of an oviparous animal?

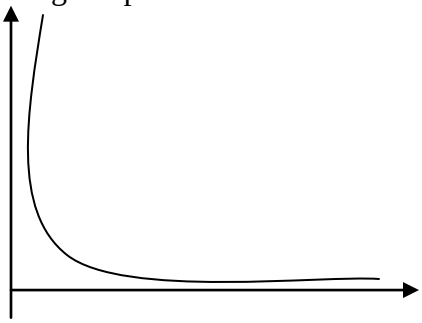
A An individual hatches from the egg outside the female parent's body
B An individual hatches from the egg in the uterus of the female parent
C An individual is born before maturity and continues to develop in the sac of the female parent.
D An individual develop in the uterus of the female parent and the embryo obtains the nutrient from the placenta.

30 The hormone which plays an important role in seed germination is

A ethene
B auxin
C cytokinin
D gibberellin

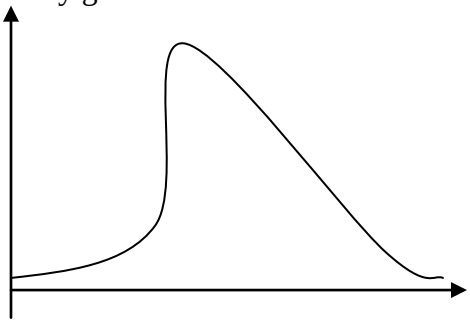
31 Which of the following is the absolute growth curve of maize plant?

Gain as percentage of previous mass



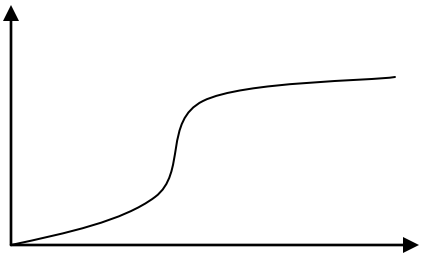
A Age/weeks

Daily gain



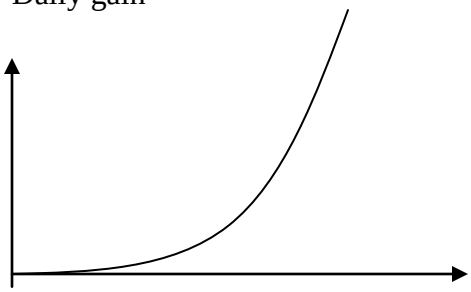
B Age/weeks

Gain as percentage of previous mass



C Age/weeks

Daily gain



D Age/weeks

32 The following are events that occur during seed germination.

I Synthesis and secretion of enzymes
II Activation of the aleurone layer
III Flow of sugars to the embryo
IV Release of gibberellin
V Hydrolysis of starch

Which of the following is the **correct** sequence of events during seed germination?

A	II	IV	V	III	I
B	IV	I	V	II	II
C	IV	II	I	V	III
D	V	III	IV	II	I

33 In a species of flowering plant, C^R C^R genotype produces red flowers, C^w C^wgenotype produces white flowers and C^R C^wgenotype produces pink flowers. What is the percentage of the progeny that have pink flowers if a cross is made between C^RC^w and C^RC^w ?

A 0 %
B 25 %
C 50 %
D 75 %

34 Which of the following is the genotype of klinefelter syndrome?

A XO
B XXY
C XYY
D XXX

35 Which of the following mutations in humans is /are trisomic?

I Down Syndrome
II Turner Syndrome
III Thalassemia major

A I only
B II only
C I and III
D II and III

36 Which of the following is **not true** of mutation?

A A chromosomal mutation of the deletion type involves the deletion of a base pair from gene.
B Genetic desease called *cri-du-chat* syndrome is caused by a deletion in chromosome 5
C The deletion of two bases causes frame-shift mutation during triplet coding in transcription.
D Allopolyploidy is a chromosomal mutation which involves chromosome doubling caused by different genomes.

37 A study on 400 mice about their resistance towards a type of poison has been carried out. The resistance characteristic is controlled by a the dominant allele R. 36% of the mice population is found to be resistant towards the poison. Calculate the number of mice expected to have Rr genotype.

A 16
B 72
C 128
D 256

38 Which of the following is **true** of repressor protein?

A It is coded by *lac* Y.
B It binds with the promoter and inhibits transcription.
C It binds with gene that codes for β-galacosidase.
D It changes is conformation after binding with lactose

39 A mutation in the lactose operan occurs which causes the repressor protein not being able to bind with the operator region. Which of the following statements is **true** of the mutation?

A β -galacosidase enzyme is not produced at all.
B β -galacosidase enzyme is produced continuosly with or without lactose.
C β -galacosidase enzyme is produced continuosly in the absence of lactose only.
D β -galacosidase enzyme is produced continuosly in the presence of lactose only

40 Which of the following are **true** of restriction enzymes?

I It restricts transcription.
II It is found in all eukaryotic cells.
III It acts on palindromic sequences.
IV It is sensitive to changes in temperature and pH.

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

41 Which of the following are the products of the translation of the lactose operon?

I Permease
II Transacetylase
III β -galacosidase
IV RNA polymerase

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

42 Which of the following regarding taxa and their examples **not correct**?

A Phylum: Chordata
B Class: Mammalia
C Order: Hominidae
D Species: *sapiens*

43 Which of the following statements is **not true** of an artificial classification system?

A The system is based on phylogenetic relationship.
B The system can be used toconstruct dichotomous keys.
C Organisms are placed into groups for specific purposes.
D Organisms are placed into group according to their different characteristics which are arbitrarily chosen.

44 Based on the table below, match phyla of organisms to their characteristics.

	Phylum		Characteristic
I	Cnidaria	P	Body divided into head,muscular foot and visceral mass
II	Artropoda	Q	Diploblastic body, polymorphism
III	Mollusca	R	Segmented legs, chitinous exoskeleton
IV	Nematoda	S	Body covered with thin and elastic cuticle, pseudocoelom

	I	II	III	IV
A	P	Q	S	R
B	Q	R	P	S
C	R	S	Q	P
D	S	R	P	Q

45 Which of the following energy flows in an ecosystem involves the transfer of the greatest amount of energy?

A Plant → Herbivore
B Plant → Decomposer
C Herbivore → Carnivore
D Carnivore → Decomposer

46 Based on the table below, match the evidence of evolution theory to its example.

	Evidence of evolution theory		*Example*
I	Paleontology	P	Marsupial animal
II	Geographical distribution	Q	Homolog structure
III	Comparative anotomy	R	Fossil recordC
IV	Comparative biochemistry	S	Cytochrome

	I	II	III	IV
A	P	Q	S	R
B	P	S	R	Q
C	R	P	Q	S
D	R	Q	P	S

47 Carrying capacity of a population is

A the number of individuals in a population
B the population size when the mortality rate is more than the natality rate
C the population size when the natality rate is more than the mortality rate
D the population size of species which can be supported by resources available in a habitat

48 A total of 50 squirrels were caught from a forest, marked and released. A few days later, 40 squirrels were caught from the same region and 4 of them had marks. Estimate the population size of the squirrels in that forest.

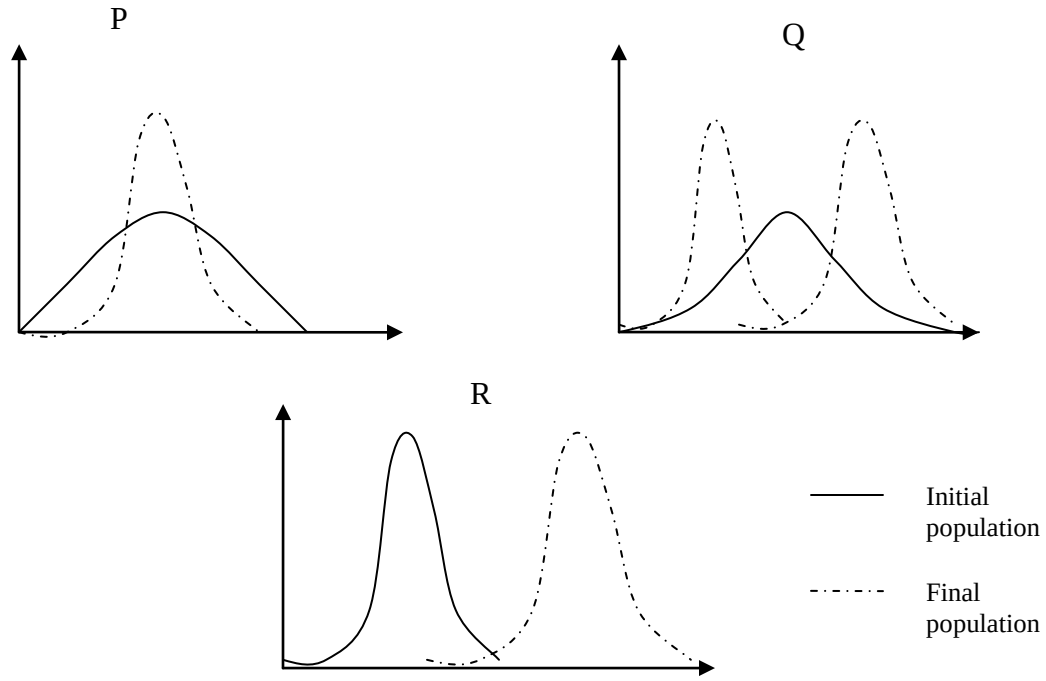
A 160
B 200
C 500
D 2000

49 Which of the following are **true** of an ecosystem?

I Phytoplanktons are producers.
II The last consumer obtains the highest energy.
III Ecosystem is an open system with input and output of energies.
IV Heterotrophs include herbivores, carnivores, decomposers and detritivores.

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

50 The graphs below show the effects of three types of ecological selections.



Which of the following is correct regarding *Biston betularia* in industrial areas, human birth weight in developed countries and rabbit population in the Andes Mountains?

	Biston betularia in industrial areas	Human birth weight in developed countries	Rabbit population in the Andes Mountains
A	P	Q	R
B	Q	R	P
C	R	P	Q
D	R	Q	P