

Version No.			

ROLL NUMBER						

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

Answer Sheet No. _____

Sign. of Candidate _____

Sign. of Invigilator _____

BIOLOGY SSC-II (2nd Set)

SECTION – A (Marks 12)

Time allowed: 15 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. **Do not use lead pencil.**

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

- (1) In which of the following organism alcoholic fermentation takes place?
 A. Saccharomyces cerevisiae B. Streptococcus species
 C. Lactobacillus species D. Homo sapiens
- (2) Which one of the following row correctly describe the functions of the diaphragm, cilia and mucous in human gaseous exchange system?

	Diaphragm	Cilia	Mucous	
A	Contracts to cause breathing out	Trap bacteria from air	Absorb CO ₂ coming from alveoli	<input type="radio"/>
B	Contracts to cause breathing in	Carry mucous to the throat	Trap dust and bacteria from air	<input type="radio"/>
B	Relaxes to cause breathing in	Filter dust from air	help in sound production	<input type="radio"/>
C	Relaxes to cause breathing out	Produce mucous	Decrease acidity	<input type="radio"/>

- (3) In which one of the following method of artificial vegetative propagation, a new plant can be grown on another planet?
 A. cutting B. tissue culturing
 C. cloning D. grafting
- (4) Which one of the following row shows substances that are present in each of the structures of excretory system of a healthy human?

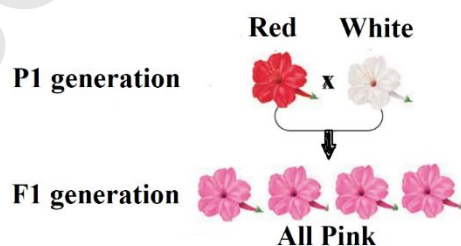
	Renal artery	Renal vein	Ureter	Urinary bladder	
A	glucose	glucose	salts	urea	<input type="radio"/>
B	protein	salts	water	protein	<input type="radio"/>
C	salts	water	protein	glucose	<input type="radio"/>
D	urea	glucose	protein	salts	<input type="radio"/>

- (5) Gouty arthritis is primarily caused due to:
- A. degeneration of cartilage
 - B. inflammation of membrane at joint
 - C. decreased calcium levels in bones
 - D. Accumulation of uric acid crystals

- (6) By identifying the plants in the following diagram, find the most relevant statement about such plants:



- A. They are protein rich so highly preferred food of the insects
 - B. They are most common in dry harsh conditioned such as deserts
 - C. They grow in the soil which lacks minerals & nitrogen compounds
 - D. They have mutualistic association with insects
- (7) Four characters of a specific hormone are listed below
- Increased rate and intensity of heart beat
 - Increased blood pressure
 - Decreased blood flow to skin & alimentary canal
 - Increased blood flow to limb
- Which one of the following is this hormone?
- A. Adrenaline
 - B. Glucagon
 - C. Insulin
 - D. Testosterone
- (8) Four-O'clock plants shows incomplete dominance for flower colour. Following diagram shows a cross between red and white-flowered pure parental generations producing all pink-flowered plants.



F1 x F1 (self crossed) = F2 generation (Phenotypic ratio = ?)

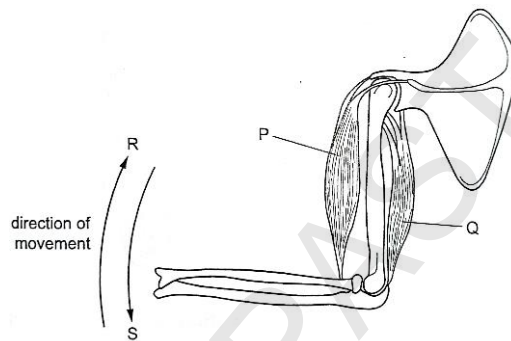
What will be the phenotypic ratio in F2 when two pink flowered plants of F1 are crossed?

- A. All pink flowered plants
- B. Red, Pink and white flowered plants in 1:2:1 ratio
- C. Red and white flowered plants in 1:1 ratio
- D. Red and white flowered plants in 3:1 ratio

- (9) Which one of the following statement is true for the eustachian tube?
- A. it separates middle ear from inner ear
 - B. it has sound receptor cells
 - C. it regulates air pressure on both sides of the tympanum
 - D. it directs sound waves to inner ear

- (10) Which one of the followings is true for the group of antibiotics called cephalosporins?
- A. they are bacteriostatic in action
 - B. they interfere with synthesis of bacterial cell wall
 - C. they inhibit the folic acid synthesis in bacteria
 - D. they inhibit the bacterial protein synthesis

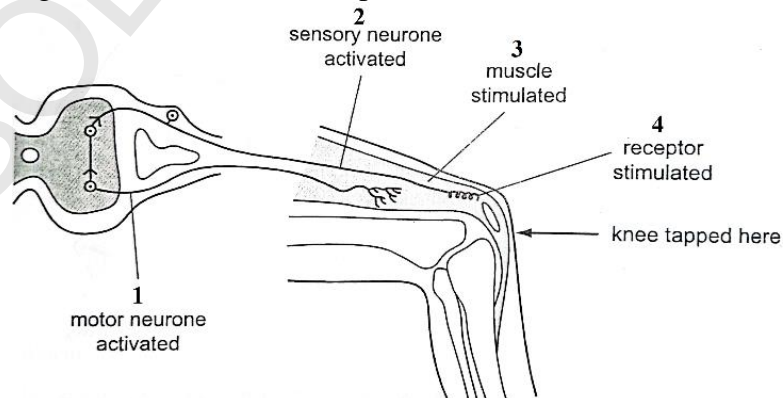
- (11) Diagram given below shows pair of antagonistic muscles and the direction of movement they produce:



Which one of the following row correctly identifies these muscles and the direction of movement they produce on contraction?

	Muscle P		Muscle Q	
	Name	Movement	Name	Movement
A	Biceps	S	Triceps	R
B	Triceps	R	Biceps	S
C	Triceps	S	Biceps	R
D	Biceps	R	Triceps	S

- (12) Diagram given below shows a simple reflex arc:



What is the correct sequence of events after the knee is tapped?

- A. 1 → 2 → 3 → 4
- B. 1 → 4 → 2 → 3
- C. 4 → 2 → 1 → 3
- D. 4 → 3 → 2 → 1

Federal Board SSC-II Examination
Biology Model Question Paper
(Curriculum 2006)

Time allowed: 2.45 hours

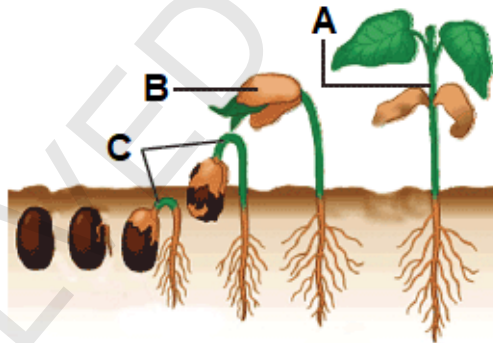
Total Marks: 53

Note: Answer any eleven parts from Section 'B' and attempt any two questions from Section 'C' on the separately provided answer book. Write your answers neatly and legibly.

SECTION – B (Marks 33)

Q.2 Attempt any **ELEVEN** parts from the following. All parts carry equal marks. Be brief and to the point. (11 × 3 = 33)

- i.
 - a. How acid rains are produced? Describe any two damages caused by acid rains to the living organism. (2)
 - b. How eutrophication affects a fresh water lake? (1)
- ii. Briefly state the roles of the following human organs in homeostasis. (3)
 - a. Lungs
 - b. Skin
 - c. Kidneys
- iii. Double fertilization is a unique event in the life cycle of an angiospermic plant. Describe and sketch the process, also explain the fate of products of double fertilization. (3)
- iv. Following diagram shows a type of seed germination.



- a. Label the parts B and C (0.5)
- b. Name and describe this type of seed germination and give example. (1.5)
- c. Precisely state two basic requirements for seed germination. (1)
- v. Why kidney stones are formed? How are they removed avoiding surgery? Mention the contributions of Al-Farabi and Abul-Qasim in treatment of kidney stones. (1+1+1)
- vi. Re-draw and complete the following table by adding the functions of given parts of the brain. (3)

Parts of Brain	Functions
Hypothalamus	
Hippocampus	
Medulla oblongata	

- vii. Name two severely harmful components present in the cigarette smoke. How they affect health and social life of a smoker? (3)
- viii. a. How bones and cartilage differ in their structure and cell types? (2)
b. Name different types of cartilage. Which type of cartilage is present in larynx and trachea? (1)
- ix. a. Define antibiotics. Enlist the precautions that we must take while using antibiotics. (2)
b. Why antibiotics are not effective against viruses? (1)
- x. Compare **diabetes insipidus** and **diabetes mellitus** using following headings. (3)
a. Causative factor b. Symptoms c. Similarity
- xi. Describe causes, symptoms and management (prevention & treatment) of asthma.(3)
- xii. Two patients A & B presented at the ophthalmology department of hospital, person A diagnosed with defective rod cells and person B diagnosed with defective cone cells.
a. Where are the rod and cone cells located in the eye? (0.5)
b. How rod cells are important for normal eye functioning? (1)
c. What type of problems will be faced to the person B? (1.5)
- xiii. a. Differentiate between ligaments and tendons. How are they important in movement of limbs? (2)
b. Define hinge joints, give example. (1)
- xiv. Define recombinant DNA technology. Outline the basic steps (in correct sequence) involved to achieve the objectives of recombinant DNA technology. (3)
- xv. In the table given below, column-A represent names of chemicals or drugs (addictive & medicinal). Redraw the table and complete the column-B by describing the type and role of the chemical as done in first row. (3)

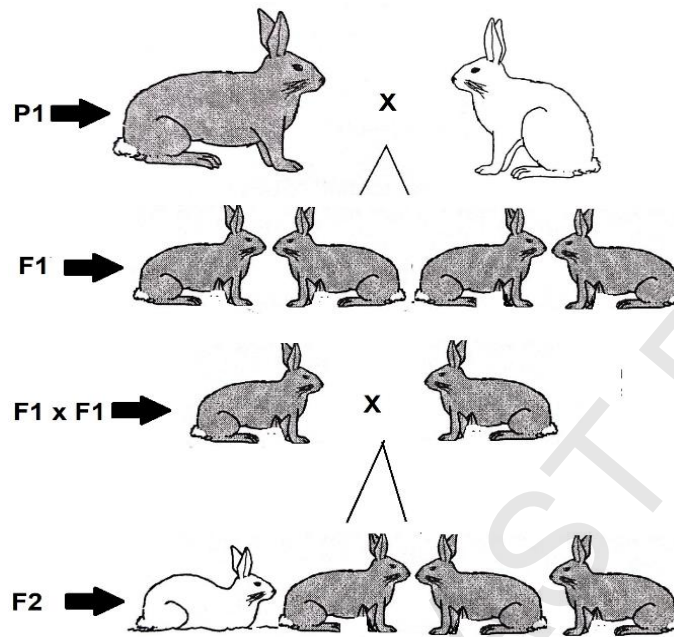
	Column-A (Names)	Column-B (Description)
1.	Marijuana	addictive drug & hallucinogen
2.	Aspirin	
3.	Cephalosporin	
4.	Diazepam	
5.	Dettol	
6.	Phenyl	
7.	Morphine	

SECTION – C (Marks 20)

Note: Attempt any **TWO** questions. All questions carry equal marks. (2×10 = 20)

- Q.3** a. Draw labelled diagrams of male and female reproductive systems of Rabbit.(2+2)
b. Nitrogen cycle is an important biogeochemical cycle which enable the living organisms to manage their nitrogen as an essential component of major biomolecules.Describe and sketch different steps of Nitrogen cycle in detail.(4+2)
- Q.4** a. Describe and draw labeled flow diagram to show the production of insulin through genetic engineering. (4+2)
b. Compare the mechanisms of hemodialysis with peritoneal dialysis. Give one merit and one demerit of both types (2+2)

- Q.5** a. Describe mechanism of evolution by natural selection relating variation, competition and differential survival of moths in England. (5)
- b. In rabbits, the allele for dark fur, “**R**” is dominant to the allele for white fur, “**r**”. The diagram given below, shows a series of crosses, starting from parental (P1) generation to first filial (F1) and finally to second filial (F2).



- i. Label the phenotypes and genotypes of the rabbits in the crosses (1)
- ii. Recalling your knowledge of Mendel’s laws of inheritance and using phenotypic and genotypic ratios in above cross name, define and explain the law to which these crosses belong. (4)

* * * *

BIOLOGY SSC-II (2nd Set)

Student Learning Outcomes Alignment Chart (Curriculum 2006)

SECTION – A

Q.1

1. Explain the method of fermentation by yeast and bacteria.
2. Gaseous Exchange in Humans • Air Passage Way, Lungs and Mechanism of Breathing.
3. Describe the two methods of artificial vegetative propagation (stem cuttings and grafting).
4. Describe that urine formation involves three processes i.e. filtration, reabsorption and secretion.
5. Discuss the causes, symptoms, and treatment of arthritis.
6. Explain competition, predation and symbiosis (parasitism, mutualism, commensalisms).
7. Explain how adrenaline may be involved in exercise and emergency conditions and use gained knowledge to apply to different hormones.
8. Explain incomplete dominance in Japanese 4 O' Clock plant.
9. Explain the components of human nervous and endocrine system, describe the structure and functioning of eyes and ears and describe nervous disorders.
10. Categorize sulfonamides, tetracyclines and cephalosporins as the major groups of antibiotics being used.
11. Describe the action of flexors and extensors as a pair of opposing muscles selecting biceps and triceps as example.
12. Define reflex action and reflex arc.

SECTION – B

Q.2

- i. a. Explain some global and regional environmental problems (population growth, urbanization, global warming, deforestation, acid rain).
b. Describe effects of pollution on plants, animals and human beings.
- ii. State skin, lungs and kidneys as the major organs involved in homeostasis.
- iii. Describe sexual reproduction in plants by explaining the life cycle of a flowering plant.
- iv. Distinguish between epigeal and hypogeal germination. Describe the conditions necessary for germination of seeds.
- v. Identify the causes of kidney stone. Identify lithotripsy and surgery as the methods to remove kidney stones. Describe the contributions of Al-Farabi and Abul-Qasim in introducing the method of removing stone from the urinary bladder.
- vi. Explain the function of these parts of brain; cerebrum, cerebellum, pituitary gland, thalamus, hypothalamus, medulla oblongata.
- vii. Demonstration of the presence of tar in cigarette smoke and also by charts showing pictures of lungs of smokers and nonsmokers.
- viii. Define skeleton and differentiate between cartilage and bone.

- ix. Describe the principle usages of painkillers, antibiotics, vaccines and sedatives. Justify the effects of probable over-dosage, under-dosage and drug interactions when using antibiotics without doctor's consultation.
- x. Outline the parts of endocrine system; major glands of this system (Pituitary, Thyroid, Pancreas, Adrenal, Gonads) and names of their respective hormone.
- xi. Respiratory Disorders and their Causes. Describe briefly diseases related to respiratory system like bronchitis, emphysema, pneumonia, asthma, and lung cancer.
- xii. Explain the components of human nervous and endocrine system, describe the structure and functioning of eyes and ears and describe nervous disorders. Explain how color blindness could be a hurdle for aircraft pilots.
- xiii. State the role of ligaments and tendons. Describe the location and movement of hinge joints.
- xiv. Explain the principles and objectives of fermentation and genetic engineering. Define genetic engineering and describe its objectives. Describe how a gene is transplanted. Describe major achievements of genetic engineering.
- xv. Categorize and describe the effects of addictive drugs (sedatives, narcotics and hallucinogens).
- Define hallucinogen (drugs that alter ordinary mental and emotional processes) and relate it with Marijuana.
 - Define narcotics (drugs that produce semi-consciousness and sleep to get relieve from pain) and relate it with Morphine and Heroine.

SECTION – C

- Q.3** a. Describe different organs of the male and female reproductive systems of rabbit.
b. Describe carbon and nitrogen cycles.
- Q.4** a. Describe the application of genetic engineering in the production of human insulin and growth hormones.
b. Explain that dialysis is one of the treatments in kidney failure. Describe the types of dialysis
- Q.5** a. Describe how variation leads to competition in a population and differential survival by best fitting the environment. Assess selection as a possible means of Evolution.
b. Describe complete dominance using the terms dominant, recessive, phenotype, genotype, homozygous, heterozygous, P1, F1, F2 generations and proving it diagrammatically through a monohybrid genetic cross. Demonstrate that the 3:1 monohybrid F-2 phenotypic ratio is an evidence of segregation of alleles. State Mendel's law of Segregation.

* * * * *

BIOLOGY SSC-II (2nd Set)

TABLE OF SPECIFICATION

Assessment Objectives	Unit 10: Gaseous Exchange	Unit 11: Homeostasis	Unit 12: Coordination	Unit 13: Support and Movement	Unit 14: Reproduction	Unit 15: Inheritance	Unit 16: Man and His Environment	Unit 17: Biotechnology	Unit 18: Pharmacology	Total Marks	% age
K (Knowledge)	2(xi)3	2(ii)3 2(v-a)1	1(7)1 1(9)1	1(5)1 2(viii)3 2(xiii)3	1(3)1 2(iv-c)1 3(a)4			1(1)1 2(xiv)3	2(ix-a)1	27	31.0%
U (Understanding)	1(2)1 2(vii)3	4(b-i)2 2(v-b)2	2(x)3 2(vi)3		2(iii)3	5(a)5	1(6)1 2(i)3 3(b)6	4(a)6	1(10)1 2(xv)3	42	48.3%
A (Application)		1(4)1 4(b-ii)2	2(xii)3 1(12)1	1(11)1	2(iv-a&b)2	1(8)1 5(b)5			2(ix-b)2	18	20.7%
Total Marks	7	11	12	08	11	11	10	10	7	87	100%

KEY:

1(1)(01)

Question No (Part No.) (Allocated Marks)

Note: (i) The policy of FBISE for knowledge based questions, understanding based questions and application based questions is approximately as follows:

- a) 30% knowledge based.
- b) 50% understanding based.
- c) 20% application based.

(ii) The total marks specified for each unit/content in the table of specification is only related to this model question paper.

(iii) The level of difficulty of the paper is approximately as follows:

- a) 40% easy
- b) 40% moderate
- c) 20% difficult