DHIRUBHAI AMBANI INTERNATIONAL SCHOOL

PRELIMINARY EXAMINATION

Subject: Biology
Std.: X A

Date: January 9, 2016
Time: 2 hours
(Plus 15 minutes reading time)

Marks: 80

General Instructions:

- All answers must be written on the separate answer booklet provided.
- Attempt all questions from Section A and any four from Section B.
- The intended marks for questions or parts of questions are given in brackets. [ ]
- This paper consists of 7 questions on 12 pages.

Section A [40 Marks]

Attempt all questions

Question 1

a) Name the following: [5]

(i) A type of leucocyte which produces antibodies in response to an antigen.

(ii) A pollutant largely responsible for acid rain.

(iii) Soluble protein present in blood plasma responsible for blood clotting.

(iv) The valve present between the chambers of the right side of the heart.

(v) A specific part of chromosome that determines hereditary characteristics.

b) State whether the following statements are True or False. If False, rewrite the correct statement by changing the underlined word(s). [5]

(i) Red cross society organizes campaigns for the control of epidemic and endemic diseases.

(ii) Methane is a green house gas.

(iii) Endothelium is the inner mucous membrane lining of the uterus.

(iv) Photolysis is the conversion of ADP to ATP during photosynthesis.

(v) Pupil regulates the amount of light entering the eye.

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c) **Write the functional activity of the following part:** [5]

(i) Hypothalamus

(ii) Seminal vesicle

(iii) Guard cells

(iv) Placenta

(v) Cerebellum

d) **Differentiate between the following on the basis of instructions given in brackets.** [5]

(i) Anaphase and Telophase (characteristic feature)

(ii) Liver and Kidney (role in homeostasis)

(iii) Corpus callosum and Corpus luteum (function)

(iv) Natural reflex and Conditioned reflex (definition)

(v) Poliomyelitis and Tuberculosis (vaccine)

e) **Given below are five sets, with four terms each. In each set, one term is odd and cannot be grouped into the category to which the other three belong. Identify the odd one in each set and name the category to which the remaining three belong.** [5]

(i) Basophils, Neutrophils, Monocytes, Eosinophil

(ii) Cholera, Whooping cough, Diphtheria, Measles

(iii) Cresol, Lime, Mercurochome, Bordeaux mixture

(iv) Cretinism, Myxoedema, Simple goiter, Acromegaly

(v) Astigmatism, Haemophilia, Hyperopia, Cataract

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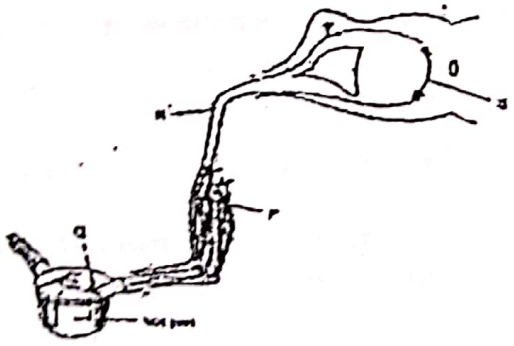
f) Select the correct answer out of the four available choices. [5]

a) Which type of immunity is acquired by each of the following actions?

	Antigens injected into a child by vaccination	Antibodies crossing the placenta to the foetus	Antibodies received by baby from breastfeeding
A	Passive	Passive	Active
B	Passive	Active	Passive
C	Active	Active	Active
D	Active	Passive	Passive

b) The diagram shows the structures involved in a reflex action



What shows the sequence in which these structures become involved?

A. P → Q → R → S

B. P → S → R → Q

C. Q → R → S → P

D. Q → S → P → R

c) In fruit flies, the allele for grey body,G, is dominant over the allele for black body, g.

The result of mating between two flies is shown.

(parents) grey –bodied fly X black- bodied flies

(offspring) grey bodied flies + Black bodied flies

What were the genotypes of the parents?

A. Gg x gg

B. Gg X Gg

C. GGX gg

D. GG X Gg

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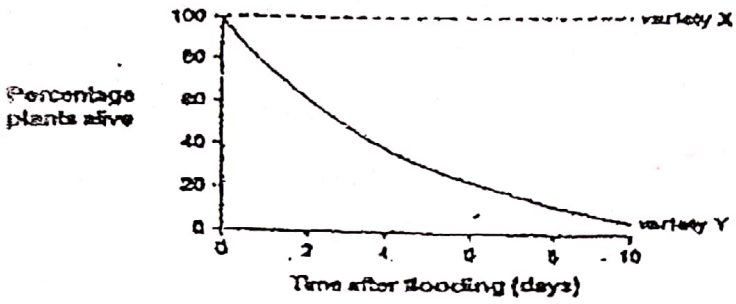
d) A strong solution of salt accidentally flooded a field of young rice plants.

The graph shows the effect on two varieties of rice in the field.



What causes the effect shown by the graph?

A. Water enters the root cells of X.
B. Water enters the root cells of Y.
C. Water leaves the root cells of X.
D. Water leaves the root cells of Y.

e) The table shows the rates of water uptake and transpiration of a plant during a morning.

Time	9.00a.m	10.00 a.m	11.00 a.m	12.00 p.m
Rate of water uptake/cm3 per hour	15	16	16	17
Transpiration /cm3 per hour	7	12	16	19

At what time does the plant show signs of wilting?

A. 9.00 a.m
B. 10.00 a.m
C. 11.00 a.m
D. 12.00 p.m

g) State the location of the following. [5]

(i) Hydathodes

(ii) Pituitary gland

(iii) Sinoatrial node

(iv) Amnion

(v) Cerebrospinal fluid

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h) **Given below are five sets of terms. In each case , arrange and rewrite each set of terms so as to be in logical sequence.** **[5]**

(i) Stoma, Mesophyll cells, Xylem, Substomatal space, Intercellular space.

(ii) Luteal phase, Follicular phase, Menstrual phase, Ovulatory phase.

(iii) Posterior venacava, Renal artery, Aorta, Renal Vein, Kidney

(iv) Seminiferous tubule, Penis, Urethra, Epididymis, Vas deferens

(v) Metaphase, Prophase, Interphase, Telophase, Anaphase

Section B [40 Marks]

Attempt any four out of six questions from this Section

Question 2

a) **Explain the terms** **[5]**

(i) Plasmolysis

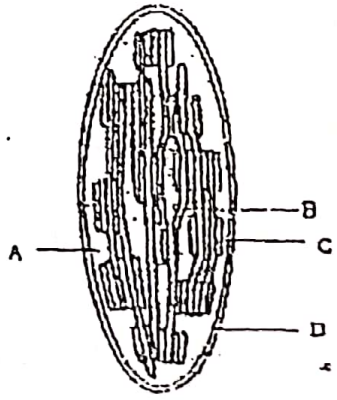
(ii) Gestation

(iii) Population density

(iv) Power of accommodation of eye

(v) Diastole

b) **Given below is the structure of a cell organelle. Observe the given organelle and answer the questions that follow.** **[5]**



(i) What is the role of part A?

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(ii) State the location and function of the given structure.

(iii) Write the complete form of NADP.

(iv) What is the source of oxygen released into the air as a product of photosynthesis?

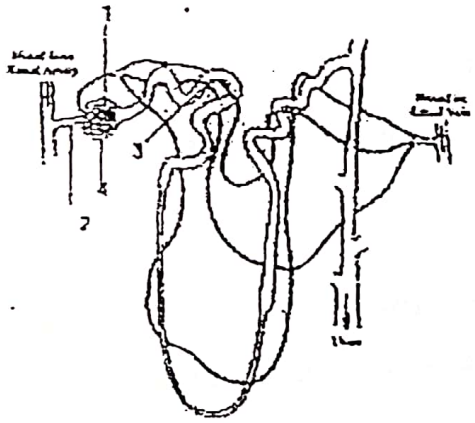
(v) If you are planning an experiment to show the effect of light on photosynthesis

(a) Will you select white light or green light? Justify your answer.
(b) Why would you select a destarched plant?

(vi) State the exact location of chlorophyll. How is chlorophyll removed from leaf in starch test?

Question 3

a) **Given below is the diagram of the renal tubule. Observe the given diagram and answer the questions that follow.** **[5]**



(i) In a healthy kidney which of these substances are expected to be found in urine

A. Urea, Sodium chloride, Proteins
B. Urea, Sodium chloride
C. ~~Urea, Sodium chloride, Proteins~~
D. Urea, Glucose, Proteins

(ii) Name two substances secreted by the walls of the DCT into the tubular fluid.

(iii) Which structure responds to ADH by reabsorbing water?

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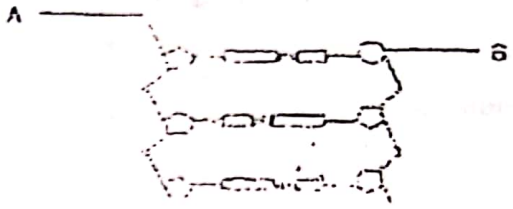
(iv) State any two characteristic features of part 4.

(v) How is the hydrostatic pressure created in part 1?

(vi) Why is the renal cortex dotted in appearance?

b) **Answer the questions given below.**

I. a) **The diagram given below shows the structure of a small section of DNA.** Label A and B **[3]**



(b) The percentage of thymine in the DNA of an organism is approximately 30%. What is the percentage of guanine?

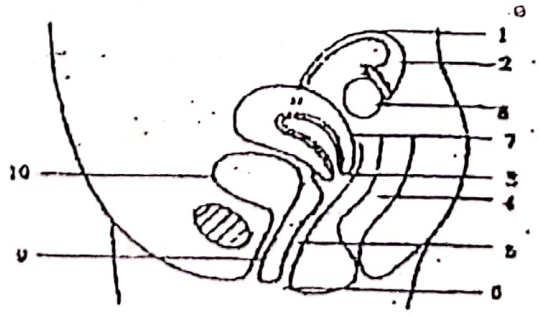
A. 70%
B. 30%
C. 40%
D. 20%

(c) How many nucleotides are shown in the above diagram?

II. Draw a neat labeled diagram to show the metaphase stage of mitosis in an animal cell. **[2]**

Question 4

a) **With reference to the human female reproductive system answer the questions that follow** **[5]**



(i) In human embryo development, what is the approximate time span between fertilization and implantation of the blastocyst?

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(ii) During the menstrual cycle, what occurs in response to a fall in the progesterone level?

(iii) Which hormone triggers ovulation during menstrual cycle?

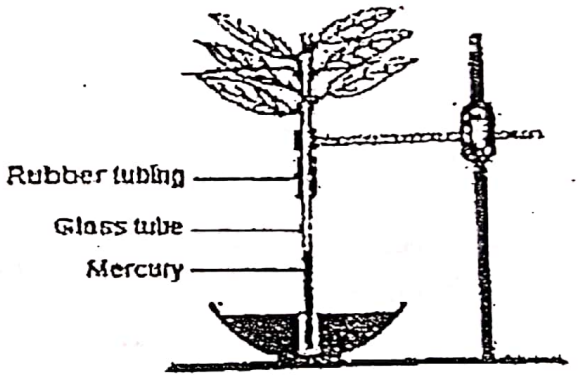
(iv) State the function of oxytocin.

(v) Name and number the part with reference to the given function

(i) Site of fertilization
(ii) Site of implantation
(iii) Site of oogenesis

(vi) Millions of sperms are released in single ejaculation though only one ovum is produced by female body. Give reason.

b) **The diagram given below represents an experiment to demonstrate a certain phenomenon in a green plant.** [5]



(i) Has the level of mercury in the glass tube risen or fallen?

(ii) Name the life process of the plant which has caused the change in the level of mercury.

(iii) Define the process mentioned in (ii).

(iv) Which conducting tissue of the plant does the glass tube represent?

(v) State two adaptive features of xerophytes.

Question 5

a) **Given below is the diagrammatic representation of the circulatory system in the human body. Observe the given diagram and answer the questions that follow.** [5]

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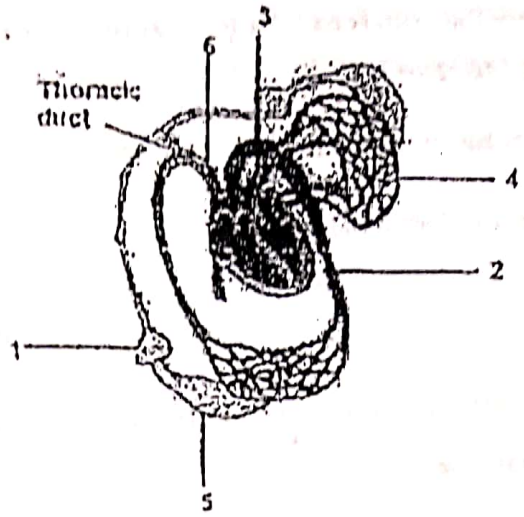


(i) Why does the blood in '2' flow in spurts?

(ii) Differentiate between Blood pressure and Pulse.

(iii) Name valves that open during ventricular systole.

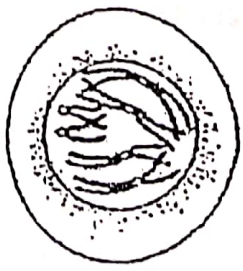
(iv) State the function of part '3'.

(v) State two characteristic features of the blood vessel marked 4.

(vi) What is the function of part 1?

(vii) State the significance of part 5.

b) **The given animal cell represents a stage of cell division. Observe the given diagram and answer the questions that follow.** [5]



(i) Identify the type of cell division.

(ii) What is the significance of the given stage of cell division?

(iii) State the number of daughter cells and chromosome number in daughter cells produced after division of given cell.

(iv) Where does the observed cell division occur in human body?

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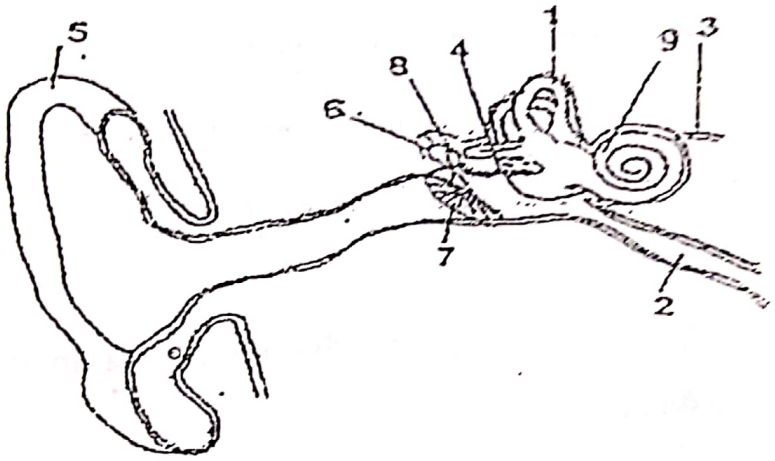
(v) Nucleus in each cell in the stem of a plant contains 32 chromosomes. How many chromosomes are there in the nuclei of the pollen grains?

(vi) State the location of

a) Centromere
b) Centrosome

Question 6

a) Observe the diagram of the human ear and answer the questions that follow.



(i) What common term is given to the parts labeled 6,8,4?

(ii) Would there be any difference if these three parts mentioned in (i) above were replaced by one big one? Why?

(iii) Name the fluid which fills the part 1.

(iv) Name the part which
(a) responds to change in position
(b) Converts sound waves to mechanical vibrations

(v) What would happen if part 2 is clogged?

(vi) Name the audio receptor cells present in the part labeled '9'.

(vii) What is the role of part 3 and 5 in hearing?

b) Give biological reasons for the following: [5]

(i) We cannot distinguish colours in moon light.

(ii) The need to reduce population is more vital today than ever before.

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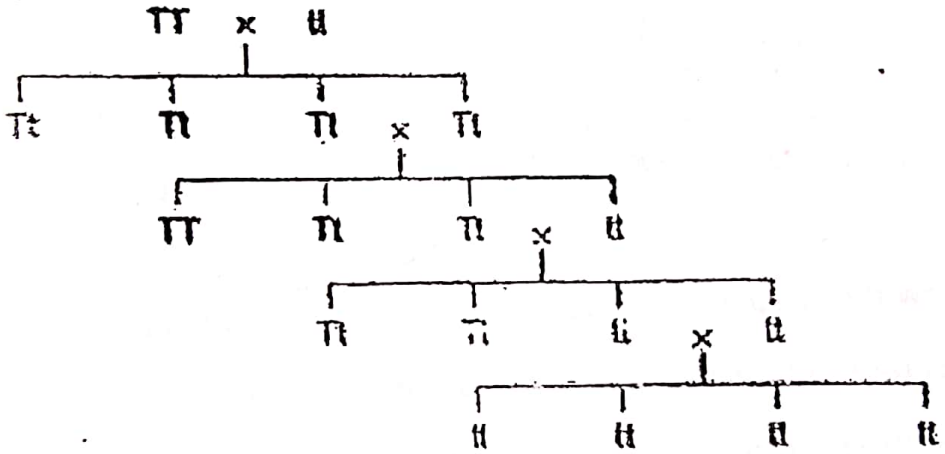
(iii) At the lime of birth, the testes descend into the scrotal sac.

(iv) People living in hilly regions mostly suffer from simple goitre.

(v) Twins may or may not be identical.

Question 7.

a) **The genetic diagram shows a breeding experiment that starts with crossing a homozygous tall plant (TT) with a homozygous short plant (tt).** [5]



(i) What is the genotype of the offspring in F2 generation?

(ii) Which genetic cross gives 1:1 phenotype and genotypic ratios?

(iii) Why did Gregor Mendel select *Pisum sativum* for his experiments on inheritance?

(iv) Define the law of purity of gametes.

(v) What does '*t*' represent in the given example?

(vi) Which of the following statements about homologous chromosomes is correct?

A. Each gene is at the same locus on both chromosomes.

B. They are two identical copies of a parent chromosome which are attached to one another at the centromere.

C. They always produce identical phenotypes.

D. They are chromosomes that have identical alleles.

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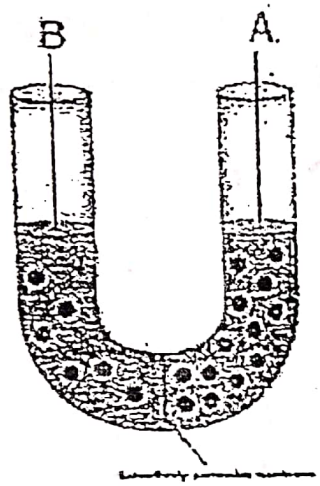
b) A student set up an experiment to study a process. Two solutions of varied tonicity were separated by a selectively permeable membrane in a 'U' shaped tube. Observe the given diagram and answer the questions that follow. [5]



(i) Redraw the diagram to show the change after a few hours.

(ii) Which part of the tube represents the root hair cell?

(iii) Define the process studied by the set up.

(iv) Mention any two advantages of this process to the plant.

(v) Suggest a suitable control for the given experimental set up.

(vi) Will the solvent molecules pass through the membrane from A to B, from B to A, in either directions, or in both directions?

X

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