



**Maharashtra Education Society's
Jr. Colleges / Higher Secondary Schools**

Preliminary Exam - (2018-19)

Std. – XII Sc.

Subject- BIOLOGY

Marks – 70

Date - 14/01/2019

Time - 3 Hrs.

Instructions

- (i) All the questions are compulsory.
- (ii) Draw neat, labeled diagrams wherever necessary.
- (iii) Question paper consists of 30 questions divided into FOUR sections, namely A, B, C and D
- (iv) **Section A** : Select and write the most appropriate answer from the given alternatives for Q. No. 1 to 4 of **multiple choice** type of questions carrying **one mark** each and Q. No. 5 to 8 are **very short answer** type of questions carrying **one mark** each.
- (v) **Section B** : contains Q. No. 9 to 18 of **short answer** type questions carrying **two marks** each. Internal choice is provided to **only one** question.
- (vi) **Section C** : contains Q. No. 19 to 27 of **short answer** type questions carrying **three marks** each. Internal choice is provided to **only one** question.
- (vii) **Section D** : contains Q. No. 28 to 30 of **long answer** type questions carrying **five marks** each. Internal choice is provided to **each** question.
- (viii) For each **MCQ**, correct answer must be written along with its alphabet,
e.g. (a) / (b) / (c) / (d)
- (ix) In case of **MCQs** (i.e. Q. 1 to Q. 4) evaluation would be done for the **first attempt** only.
- (x) Start each section on new page.
- (xi) Figures to the right indicate full marks.

SECTION – A

[8]

Q. 1 According to Chargaff's rule

(1)

- a) $A + G = T - C$ b) $A \times G = T \times C$ c) $A - G = T + C$ d) $T + C = \text{number of purine bases.}$

Q. 2 Chloroplast is self replicating cell organelle in photosynthetic plants as it has.....

(1)

- a) Plastidome b) DNA inside nucleus c) Ribosomes d) Stroma with many enzymes.

- Q. 3** The sum total of genes of all individuals of interbreeding population is called (1)
 a) gene frequency b) genetic drift c) gene pool d) genetic mutation
- Q. 4** Pulse can be felt in radial artery because (1)
 a) it's lumen is large. b) it is near to body surface. c) it is main artery. d) it is big in size.
- Q. 5** Which molecule of histone is present in the linker region of Nucleosome of DNA? (1)
- Q. 6** What is meant by milletes? (1)
- Q. 7** Why doesn't bundle sheath cells of C₄ plants participate in light reaction of photosynthesis? (1)
- Q. 8** Name the pathway / cycle in frog for the elimination of nitrogenous waste material. (1)

SECTION – B

[20]

- Q. 9** Calculate RQ from the given equation and state the nature of the substrate. (2)

$$2 (C_{51}H_{98}O_6) + 145 O_2 \longrightarrow 102 CO_2 + 98 H_2O + \text{energy}$$
- Q. 10** In eukaryotic DNA molecule, Name the bond/ linkage (2)
 a) between successive nucleotides of the same strand.
 b) between complementary strands of same DNA
- Q. 11** (2)

| Variety of rice | Name (example) of variety |
|----------------------|---------------------------|
| Semidwarf | |
| Genetically modified | |

- Q. 12** Sketch and label, female gametophyte of angiospermic plant and mention it's another name.(2)

OR

- Q. 12** If the chromosomal number in the nucleus of nucellus cells of an ovule is 24, then (2)
 what will be the chromosomal number in the nucleus of an egg, secondary nucleus, synergids and antipodal cells of the same ovule?

- Q. 13** Human evolution process predicts 'Man originated from ancient apes' (2)
- a) Name the connecting link between ape and man.
 - b) Mention distinguishing features in dentition of both.
- Q. 14** Explain restriction digestion in DNA fingerprinting technique. (2)
- Q. 15** People infected with HIV, if not treated, will develop AIDS. (2)
- a) Write down the name of therapy which suppresses replication of HIV in the body.
 - b) What is meant by HAART?
- Q. 16** Enlist byproducts of fishery (any 4), which are having commercial value. (2)
- Q. 17** Match the following. (2)
- | | |
|--------------------|---|
| a) Diapedesis | 1. deposition of fatty substance in artery. |
| b) Scavengers | 2. lymphatic vessel coming from intestine. |
| c) Atherosclerosis | 3. engulf microorganisms and remove cell debris. |
| d) Lacteals | 4. amoeboid movement to squeeze out from blood capillaries. |
| | 5. loss of elasticity |
- Q. 18** Name any two water soluble vitamins with their microbial sources. (2)

SECTION – C

[27]

- Q. 19** Number of bacteria and some fungi such as yeasts show particular type of respiration, (3)
- a) Name that respiration process.
 - b) Mention steps involved in it.
 - c) Write net gain of ATP formed.
- Q. 20** Force exerted by blood on the wall of the arteries is known as arterial blood pressure (B.P.), (3)
- a) By which instrument blood pressure is measured?
 - b) Give the types of blood pressure.
 - c) Name the disorder of high blood pressure.

Q. 21 There are some sex chromosome linked genetic disorders. (3)

- Give the name of sex chromosomal abnormality having X monosomy.
- Mention genotype of this abnormality.
- Enlist symptoms of this abnormality. (any 2)

Q. 22 In the process of selective reabsorption, about 99 % of filtrate is reabsorbed from renal tubule to the blood of peritubular capillaries, (3)

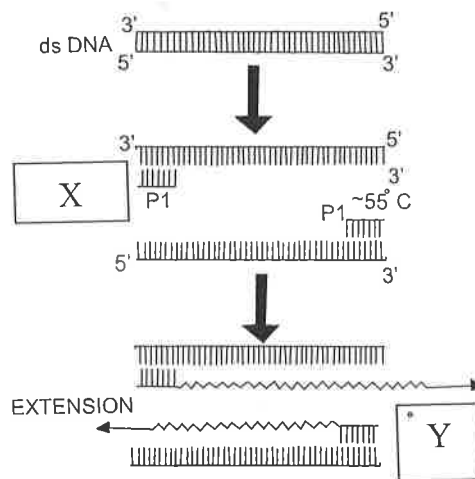
- Name the high & low threshold substances
- Name the region where water is reabsorbed

OR

Q. 22 Justify the following statements in human. (3)

- Urinary bladder shows special type of transitional epithelium.
- Valves are present in ureters.
- Opening of urethra is guarded by sphincter muscles.

Q. 23 In PCR, a) Identify X and Y in following. (3)



b) Why is Taq polymerase (enzyme) used in PCR technique?

Q. 24 Well known physiologist Dr. Melvin Calvin discovered 'path of carbon' in glucose synthesis. (3)

With reference to this -

- Name the cycle / pathway.
- Sketch diagrammatic representation of the same.

Q. 25 If farmers maintain optimum population of earthworm and soil bacteria in their farms, then how the **structure** and **organic matter** dynamics will get affected in their farms. (3)

Q. 26 Match the pairs. (3)

| Type of Pollination | example (of plant) |
|---------------------|--------------------------------|
| Chiropterophily | <i>Anthocephallus</i> (Kadamb) |
| Ornithophily | <i>Salvia</i> |
| Entomophily | <i>Butea</i> |

Q. 27 Define with one example of each. (3)
- Cursorial, Fossorial and Volant adaptation.-

SECTION - D

[15]

Q. 28 What will happen when a tall sweet pea plant with round seeds is crossed with a dwarf sweet pea plant with wrinkled seeds? Also mention the genotypic & phenotypic ratio produced in F₂ generation. (5)

OR

Q. 28 Mendel's Law of dominance is not universally applicable, explain it with deviations in brief. (5)

Q. 29 Explain various components of reflex arc with labelled diagram. (5)

OR

Q. 29 A person with lump in neck region visited the doctor. After examining, the doctor said (5)

"It is the enlargement of largest endocrine gland, because of deficiency of Iodine". So

a) Give the name of that gland.

b) Sketch and label its transverse section.

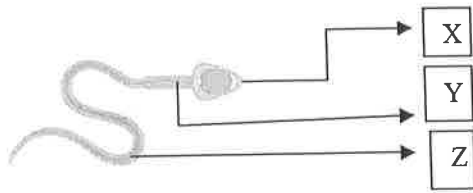
c) Enlist the names and functions of the hormones produced by this gland.

Q. 30 In Human male reproductive system,

(5)

a) Paternal gamete is called

b) Identify and give functions of X, Y, and Z in the structure,



c) Enlist the phases of gamete production in testes.

OR

Q. 30 What is menarche?

(5)

Give impact of various hormones on the structure of ovary and uterus during menstrual cycle.

