

BIOLOGY PAPER-XII
HSSC-12th-Kohat-2026
(A-I-KT-26)

Sign & Stamp of Supdt:

Roll No.

C No. 62

Name:

VERSION: B

Time Allowed: 20 Minutes

SECTION-A

Marks:18

- A patient experiences recurrent episodes of unexplained loss of consciousness. The physician suspects epilepsy but wants a non invasive test to record brain activity during a suspected episode. The appropriate test is:
 A. MRI with contrast B. CT angiography C. Electroencephalogram (EEG) D. Myelogram
- Animals that show their greatest degree of activity during the twilight hours are called:
 A. Diurnal B. Nocturnal C. Circadian D. Corpuscular
- A 22-year-old male presents with urethritis, painful urination and purulent discharge from the penis. A Gram stain shows Gram negative diplococci (*Neisseria gonorrhoeae*). The most appropriate first line treatment regimen is:
 A. Oral penicillin alone B. Ceftriaxone injection with oral azithromycin C. Oral azithromycin alone D. Injectable gentamicin alone
- The mesodermal cells that aggregate beneath the primitive streak to form the first axial support of the embryo are known as:
 A. Notochord B. Neural tube C. Somite D. Neural crest
- During the second trimester, the fetal sex can be identified because:
 A) External genitalia are fully formed B) Uterus and ovaries or testes are in place C) Sex chromosomes become active D) Fetus begins to produce sex hormones
- An individual who is Rh positive has the genotype:
 A. dd B. I^AI^B C. ii D. DD or Dd
- The phenotypic ratio observed in the F₂ generation of a Mendelian dihybrid cross is:
 A. 3:1 B. 1:2:1 C. 9:3:3:1 D. 1:1:1:1
- The short fragments of DNA synthesized on the lagging strand are known as:
 A. Okazaki fragment B. Primers C. Exons D. Replication bubbles
- The loss of a single chromosome from the diploid set, represented as 2n - 1, is called:
 A. Nullisomy B. Monosomy C. Trisomy D. Tetrasomy
- The basic idea of Lamarckism, which is now considered incorrect according to genetics, is:
 A. Inheritance of acquired characters B. Overproduction of offspring C. Struggle for existence D. Variation within populations
- All of the following are scientific processes used to convert solid wastes into gas or oil except:
 A. Hydrogenation B. Pyrolysis C. Bioconversion D. Fermentation
- During RFLP analysis, DNA fragments are separated by size using a technique called:
 A. Centrifugation B. Electrophoresis C. Chromatography D. Hybridization
- The scientist who inserted gene into *Escherichia coli* to produce synthetic human insulin was:
 A. Alec Jeffery B. Edwin Southern C. Herbert Boyer D. Gregor Mendel
- The ability to hold one's breath voluntarily is made possible by nerve impulses originating from:
 A. Medulla oblongata B. Pons C. Cerebral hemispheres D. Hypothalamus
- The binding and dissociation of oxygen from heme is primarily determined by:
 A. Blood volume B. Partial pressure of oxygen C. Body temperature D. Number of red blood cells
- Human Leukocyte Antigens (HLAs) are proteins found on the surfaces of:
 A. Red blood cells B. Platelets C. Leukocytes D. Plasma
- The type of muscle found in the walls of hollow visceral organs such as stomach, urinary bladder and blood vessels is:
 A. Smooth muscle B. Cardiac muscle C. Skeletal muscle D. Striated muscle
- The brief reversal of the resting membrane potential during which the inside of the cell becomes more positive than the outside is called:
 A. Depolarization B. Hyper polarization C. Action potential D. Refractory period

Write Roll No. in the boxes and shade the appropriate circle.

--	--	--	--	--

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

Shade the correct answers for each question below.

1.	A	B	C	D
2.	A	B	C	D
3.	A	B	C	D
4.	A	B	C	D
5.	A	B	C	D
6.	A	B	C	D
7.	A	B	C	D
8.	A	B	C	D
9.	A	B	C	D
10.	A	B	C	D
11.	A	B	C	D
12.	A	B	C	D
13.	A	B	C	D
14.	A	B	C	D
15.	A	B	C	D
16.	A	B	C	D
17.	A	B	C	D
18.	A	B	C	D
19.	A	B	C	D
20.	A	B	C	D

Q.2 Attempt any TEN parts. All parts carry equal marks.

- i. Define otitis media. How does the eustachian tube contribute to its development? Why are children more commonly affected by this disorder than adults? Provide a reason. 1+2+1
- ii. Describe human kidney both as excretory and osmoregulatory organ. 1+3
- iii. What does sciatica refer to? State any four common causes of sciatica. Name the nerve involved and state where it originates. ✓ 1+2+0.5+0.5
- iv. Define meningitis. Describe causes, symptoms and treatment of meningitis. 1+1+1+1
- v. State the number and location of parathyroid glands in human. Describe the effects of over secretion and under secretion of parathormone. 1+1.5+1.5
- vi. Briefly describe territory as animal behavior. Explain the primary function of territory formation. Why is defense the greatest at the time of breeding? 2+1+1
- vii. Describe urethra and semen. State two roles of prostaglandins present in semen. 1+1+2
- viii. Describe any four X-linked dominant disorders. 1+1+1+1
- ix. Who discovered Turner's syndrome? Write any three symptoms of the syndrome and state its treatment strategy. 0.5+1.5+2
- x. Define vestigial organs. Why are vestigial organs considered the most convincing evidence of evolution? State any four vestigial organs in humans. 1+2+1
- xi. What does correlation mean? Describe the correlation between average levels of CO₂ and average global temperatures. How does sea level rise and threaten coastal cities? 1+2+1
- xii. Describe biofertilizers and nanotechnology. 2+2
- xiii. How do mRNA vaccines trigger an immune response? List two benefits of mRNA vaccines compared to other types. 2+2

Section "C"

Marks: 27

Note: Attempt any THREE questions. All questions carry equal marks.

- Q.3** a). Define larynx. Explain the structure and functions of trachea. 1+3+1
 b). Define osmoregulation. Describe osmoregulation in marine water animals. 1+3
- Q.4** a). Give an outline of vertebral column in human. How many total vertebrae are present in humans? Name the five regions of the vertebral column and state the number of vertebrae in each region. What is the coccyx, and what evolutionary significance does it have? 1+0.5+2.5+1
 b). Describe sensitive period (critical period) in imprinting? List three ways by which imprinting differs from most other forms of learning. According to Konard Lorenz, what is the principal imprinting stimulus in graylag geese? 1.5+1.5+1
- Q.5** a). What are CNS and PNS? Describe forebrain, midbrain and hindbrain. 1+1+3
 b). Define allometric growth. Give an example of allometry in humans. 2+2
- Q.6** a). Define PCR. Describe its four components. 1+4
 b). Compare chromosomal determination of sex between drosophila and human. 2+2