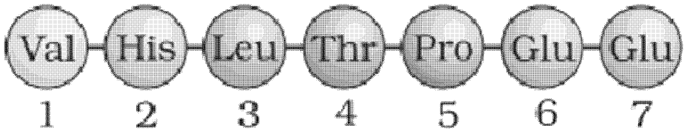
HSE – II - SET I

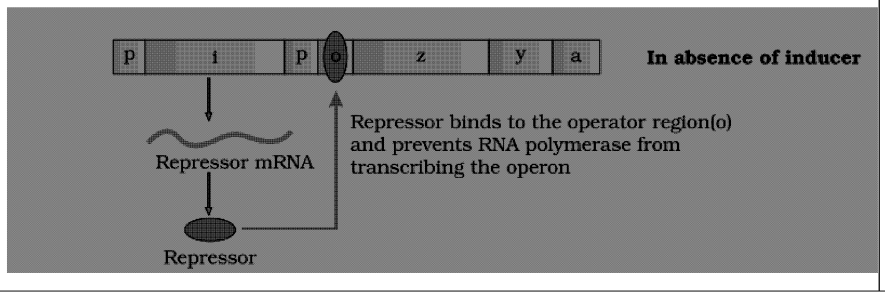
Answer Key

Zoology

<table>
<tr><th>Qn. No.</th><th>Scoring Indicators</th><th>Split Score</th><th>Total Score</th></tr>
<tr><td>1</td><td>a. Bacterial Artificial Chromosome
b. Yeast Artificial Chromosome</td><td>½
½</td><td>1</td></tr>
<tr><td>2</td><td>a. Alfred Wallace
b. Plasmodiam</td><td>½
½</td><td>1</td></tr>
<tr><td>3</td><td>Interferons</td><td>1</td><td>1</td></tr>
<tr><td>4</td><td>(a). Spermatogonia and sertoli cells.
(b). Spermatogonia – develop as sperm Sertoli cells – nourishment to developing sperms</td><td>1
1</td><td>2</td></tr>
<tr><td>5</td><td>Family planning
Reproductive and Child Health care programme.</td><td>1
1</td><td>2</td></tr>
<tr><td>6</td><td>a. Sickle cell anaemia /Autosome linked recessive trait
b. 
</td><td>1
1</td><td>2</td></tr>
<tr><td>7</td><td><table><tr><th>A</th><th>B</th></tr><tr><td>Natural selection</td><td>Charles Darwin</td></tr><tr><td>Lamarck</td><td>Inheritance of acquired characters</td></tr><tr><td>Gene flow by chance</td><td>Genetic drift</td></tr><tr><td>Analogous structures</td><td>Convergent evolution</td></tr></table></td><td>½ x 4 = 2</td><td>2</td></tr>
<tr><td>8</td><td>Balanced diet, personal hygiene regular exercise, Yoga, Awareness</td><td>any four relevant</td><td>2</td></tr>
</table>

	about diseases, vaccination (immunisation) proper disposal of wastes, control of vectors, hygienic food and water resources etc.	answers 2 score	
9	a. DNA Dependent DNA Polymerase and DNA Ligase b. DNA-dependent DNA polymerase catalyse the polymerisation of deoxyribonucleotides The discontinuously synthesised fragments are later joined by the enzyme DNA ligase	1 1	2
10	Over production-Struggle for existence -Variations- Survival of the fittest. -Speciation	one correct series ½ score ½ x 4 = 2	2
11	Splicing, Capping and tailing Primary transcripts contain both the exons and the introns and are non-functional. it is subjected to a process called splicing where the introns are removed and exons are joined in a defined order. hnRNA undergo two additional processing called as capping and tailing. In capping an unusual nucleotide (methyl guanosine triphosphate) is added to the 5 ‘ -end of hnRNA. In tailing, adenylate residues (200-300) are added at 3 ‘ -end in a template independent manner.	any two description 2 score	2
12	a. In vaccination, a preparation of antigenic proteins of pathogen or inactivated/weakened pathogen (vaccine) are introduced into the body. The vaccines also generate memory – B and T-cells that recognise the pathogen quickly on subsequent exposure and overwhelm the invaders with a massive production of antibodies. In immunisation we directly inject the preformed antibodies, or antitoxin (a preparation containing antibodies to the toxin). b. Polio vaccine, Rubella vaccine, MMR vaccine, etc	2 any relevant answers 1 score	3

13	a. Matthew Meselson and Franklin Stahl b. They grew E. coli in a medium containing 15 NH_4Cl (15 N is the heavy isotope of nitrogen) as the only nitrogen source for many generations. The result was that 15 N was incorporated into newly synthesised DNA (as well as other nitrogen containing compounds). This heavy DNA molecule could be distinguished from the normal DNA by centrifugation in a cesium chloride (CsCl) density gradient. Then they transferred the cells into a medium with normal 14 NH 4 Cl and took samples at various definite time intervals as the cells multiplied, and extracted the DNA that remained as double-stranded helices. The hybrid DNA is the proof of the DNA replication is semi conservative.	1 2	3
13	In bacteria, the mRNA does not require any processing to become active, and also transcription and translation take place in the same compartment (there is no separation of cytosol and nucleus in bacteria),many times the translation can begin much before the mRNA is fully transcribed. Consequently, the transcription and translation can be coupled in bacteria.	3	3
14	1850-No atmospheric pollution .the tree trunks inhabited by folise lichen and which appeared as white. Then dark moth becomes more conspicuous and fed by the predators. So dark moth decreased in number. 1920-industry developed –coal used as fuel- tree trunks covered with soot and smoke and become dark .Hence white coloured moth became more conspicuous and fed by the predators -So white coloured moth decreased in number. 1960 – industry develops more – electricity used as fuel. No soot and smoke on tree trunks. It began to appear as white .Hence once again dark one becomes more conspicuous and fed by predators.	3	3

	So the number of grey moth again decreased		
15	There is a positively charged, basic proteins called histones. A protein acquires charge depending upon the abundance of amino acids resides with changed side chain. Histones are rich in the basic acid reduces carry +ve charges in their side chain. Histones organised to form a unit of eight molecules called histone octamer. The negatively charged DNA is wrapped around the positively charged histone octamer to form a structure called nucelosome. The packaging of chromatin at higher level requires additional set of proteins that collectively are referred to as non histone chromosomal proteins.	3	3
16	a. Hardy Weinberg principle b. The factors affecting the principle are gene migration or gene flow, genetic drift, mutation, genetic recombination and natural selection.	1 2	3
17		3	3