

SAHODAYA PREBOARD EXAMINATION – (2025-26)
CLASS-XII

BIOLOGY (044)					
SET-01					
SECTION - A					
1.	(B) 5n,3n				1
2.	(C) Female flowers reach the surface of the water, pollen grains reach stigma and achieve pollination				1
3.	(D)	1 ^o Oocyte (n)	Ootid/Ovum (n)	Blastocyst	1
4.	(C) S R T & 10%				1
5.	(C) tRNA, 5s rRNA, snRNAs				1
6.	(A) A – III; B – IV; C – I; D – V; E – II				1
7.	(D) 9				1
8.	(C) Graph ‘C’				1
9.	(B) Gene flow refers to the movement of alleles from one population to another, and it always increases. genetic diversity.				1
10.	(B) Carcinogens are the agents that transform the neoplastic cells into normal cells.				1
11.	(C) They are produced by prokaryotes only.				1
12.	(C) non recombinant bacteria containing B-galactosidase				1
13.	C. A is true but R is false.				1
14.	A. Both A and R are true and R is the correct explanation of A.				1
15.	A. Both A and R are true and R is the correct explanation of A.				1
16.	D. A is False but R is true				1
SECTION-B					
17.	Cross IiGG x Iigg Genotype of parents			1 $\frac{1}{2} \times 2$	2
18.	(A) (a) Production of non-structural proteins (b) Moisture and Temperature (c) release of haemozoin			$\frac{1}{2} \times 4$	2

	(d) Inflammation of Lymphatic vessels OR (B) (a) Depressent/ slows down body functions (b) Effect on cardiovascular system of the body (c) Any one point (d) Hallucination	½x4	
19.	(A) (i) No polymerization/Extension because it can't withstand high temperature/denature in high temperature. ii) PCR- Amplification of gene of interest synthesized invitro. Gene Cloning- Ability to multiply copies of desired gene in recombinant cell/ heterologous host. OR (B) B- Ori- Control copy no and initiation of replication. C- rop- Codes for proteins involved in the replication of DNA.	½x2 ½x2 ½x4	2
20.	(A) Commensalism and parasitism respectively. (B) Flamingo- residential fish on zooplankton- South American Lake.	½x2 ½x2	2
21.	(A) Diagram of : (a) Sea (inverted) Forest (Upright) (b) Limitations – Any Two points OR (B) Abiotic factors- Presence of oxygen, temperature and moisture – quicker Biotic factors- Detritus: Lignin and chitin- slower Nitrogen and water soluble sugars- quicker	½ ½ ½x2 ½x2 ½x2	2
SECTION - C			
22.	(A) Oxytocin (B) Mild Uterine Contraction/ Foetal ejection reflex. (C) The stimulatory reflex between the uterine contraction and oxytocin, continuous secretion oxytocin, stronger and stronger contractions, leads to expulsion of the baby out of the uterus through the birth canal – parturition.	½ ½ ½x4	3
23.	(A) This is an autosome-linked recessive blood disease. The defect could be due to either mutation or deletion which ultimately results in reduced rate of synthesis of one of the globin chains (α and β chains) that make up haemoglobin. (B) Thalassemia differs from sickle-cell anaemia in that the former is a quantitative	½x2	3

	<p>problem of synthesizing too few globin molecules while the latter is a qualitative problem of synthesizing an incorrectly functioning globin.</p> <p>(C) Pleiotropy – One gene controls many characters</p> <p>Polygenic inheritance- many genes control one character.</p>	<p>½x2</p> <p>½x2</p>	
24.	<p>A) Darwinism, the theory of natural selection has a wide acceptance. However, it has been criticized too, on the ground it could not explain how the variations arise.</p> <p>B) Now, the most accepted theory of evolution is known as synthetic theory of evolution, in which the origin of species is based on the interaction of genetic variation and natural selection.</p> <p>C) Oparin of Russia and Haldane of England proposed that the first form of life could have come from pre-existing non-living organic molecules (e.g. RNA, protein, etc.) and that formation of life was preceded by chemical Evolution</p>	<p>1</p> <p>½x2</p> <p>½x2</p>	3
25.	<p>(A) A- Mechanical agitation. C- Activated sludge D- Anaerobic sludge Digester</p> <p>(B) Process – Digest the bacteria and fungi in the sludge and production of mixture of gases form Biogas.</p> <p>(C) Significance-Low BOD due to the digestion of the organic matter aerobically.</p>	<p>½x3</p> <p>½x2</p> <p>½</p>	3
26.	<p>(A) P -Intact or undigested vector Q-Vector digested by restriction Enzyme</p> <p>(B) In Q Vector is digested by only one restriction enzyme hence has 2 fragments in the gel. In R the vector is digested by 2 restriction enzymes hence has 4 fragments in the gel.</p> <p>(C) Pure DNA stained with etBr, produce orange color band went exposed to UV rays.</p>	<p>½x2</p> <p>½x2</p> <p>½x2</p>	3
27.	<p>(A) Line-1, As the resources are constrained competition will be higher, so it is declining.</p> <p>(B) Line-3. Sigmoid curve.</p> <p>(C) Line-2, Exponential-J shaped</p>	<p>½x2</p> <p>½x2</p> <p>½x2</p>	3
28.	<p>(A) Ramsar convention is an international treaty for the conservation and utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific and recreational value.</p> <p>(B) Ex Situ Conservation and explanation.</p> <p>(C) Any two points.</p>	<p>½x2</p> <p>½x2</p> <p>½x2</p>	3

SECTION - D							
Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.							
29.	(A) Microspores- 62 chromosomes, Gamete/sperm cells- 62 Chromosomes.	½x2	4				
	(B) Generative cell undergoes mitosis to produce two male gametes.	1					
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">CASE-I</td> <td style="width: 50%; text-align: center;">CASE-II</td> </tr> <tr> <td style="text-align: center;">After pollen germination/ On stigma</td> <td style="text-align: center;">Before pollen germination/ Within anther</td> </tr> </table>	CASE-I		CASE-II	After pollen germination/ On stigma	Before pollen germination/ Within anther	½x2
	CASE-I	CASE-II					
After pollen germination/ On stigma	Before pollen germination/ Within anther						
(C) No of PMCs= $3200/8 = 400$	1						
OR							
	(D) No of generative cells = $1600/2 = 800$	1					
30.	(A) Secondary/ Anamnestic response. As memory cells are already present.	½x2	4				
	(B) (i)						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">1st exposure</td> <td style="width: 50%; text-align: center;">2nd exposure</td> </tr> <tr> <td style="text-align: center;">IgG and IgM produced less in number.</td> <td style="text-align: center;">IgG and IgM produced in large number.</td> </tr> </table>	1 st exposure		2 nd exposure	IgG and IgM produced less in number.	IgG and IgM produced in large number.	½x2
	1 st exposure	2 nd exposure					
	IgG and IgM produced less in number.	IgG and IgM produced in large number.					
	(ii) IgA, Passive immunity	½x2					
(C) As injection of vaccine (inactivated/attenuated pathogen or antigenic preparation) create primary immune response/memory cells. When the same pathogen/antigen infects naturally, our body shows secondary immune response.	½						
	½						
OR							
	(D) To allow the immune system sufficient time to develop a robust primary response, establishing strong immunological memory and ensure the second booster dose achieves maximum effectiveness in eradicating the antigen.	1					
SECTION-E							
31.	(A) (a) Diagram	1	5				
	Proper labelling with technical terms	½x4					
	(i) Acrosome						
	(ii) Mitochondria/Nebenkern						
	(iii) Nucleus						
(iv) Tail							
(B) (I) Sertoli cells/Nurse Cells							
(II) Leydig's cell/Interstitial cells							
(III) Spermiogenesis	½x4						
(IV) Androgen/testosterone							
OR							
	B) (a) (i) Periodic abstinence as ovulation occurs during that period.	½x2					

	(ii) 14 th to 21 st day (b) <ul style="list-style-type: none"> • Semen collection from male partner • Ova collection from female partner • ICSI & explanation • Embryo transfer- ZIFT and IUT • Embryo transfer to surrogate mother. 	½ ½ ½ ½x2 ½x2 ½	
32.	(A) 5'-ATG ACC GTA TTT TCT GTA GTG CCC GTA CTT CAG GCA TAA - 3' = CODING (i) 3'-TAC TGG CAT AAA AGA CAT CAC GGG CAT GAA GTC CGT ATT-5'- TEMPLATE 5'-AUG ACC GUA UUU UCU GUA GUG CCC GUA CUU CAG GCA UAA-3' mRNA (i) In a bacterium 5'-AUG ACC GUA UUU UCU GUA GUG CCC GUA CUU CAG GCA UAA-3' (iii) a) 5'CAG3' b) No/No tRNA for Stop codons Release factors bind to stop codons OR (B) (a) They used ¹⁵ N and ¹⁴ N for their experiments. ¹⁵ N was the heavy isotope of nitrogen and could be separated from ¹⁴ N by centrifugation. (b) E. coli has generation time of 20 minutes so the samples taken at intervals of 20 minutes to understand the mode of replication when E. coli with ¹⁵ N DNA was cultured in medium ¹⁴ N (normal) nitrogen. (c) Using cesium chloride density gradient centrifugation the heavy DNA (with ¹⁵ N incorporated) can be differentiated from normal DNA (with ¹⁴ N incorporated). (d) Meselson and Stahl concluded that DNA replication is semi-conservative.	1 1 1 ½ ½ 1+1 1 1 1	1
33.	(A)(i) Air/Oxygen as <i>Lactobacillus</i> is anaerobic. (ii) pH and Temperature. Advantages: <ul style="list-style-type: none"> • Proper mixing of nutrients • Oxygen availability • Foam control • Sampling port (iii) Biolytic / Gene gun with explanation. OR (B) (a) (i) Property- Totipotency , Technique- Micropropagation/ Tissue culture (ii) Raw materials- Nutrients/hormones/aseptic condition For division of explant and differentiation of callus (b) A- totipotent cell and its definition. B- Pluripotent cells and its definition. (c) Validity of GM research and safety of introducing GM organisms.	½x2 ½x2 ½x4 ½x2 ½x2 ½x2 ½x2 ½x2	