

BSEH MARKING SCHEME

(Haryana Open School)

CLASS- XII

Biology (Model Paper 2026-27)

Code: A

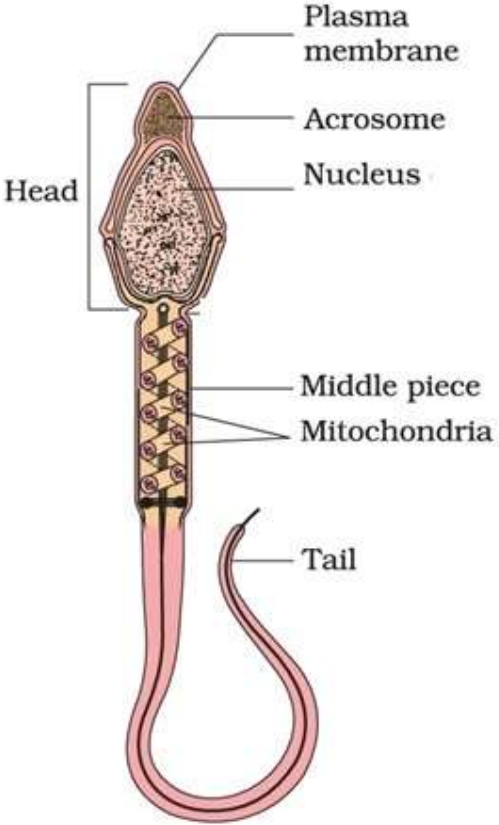
- The answer points given in the marking scheme are not final. These are suggestive and indicative. If the examinee has given different, but appropriate answers, then he should be given appropriate marks.

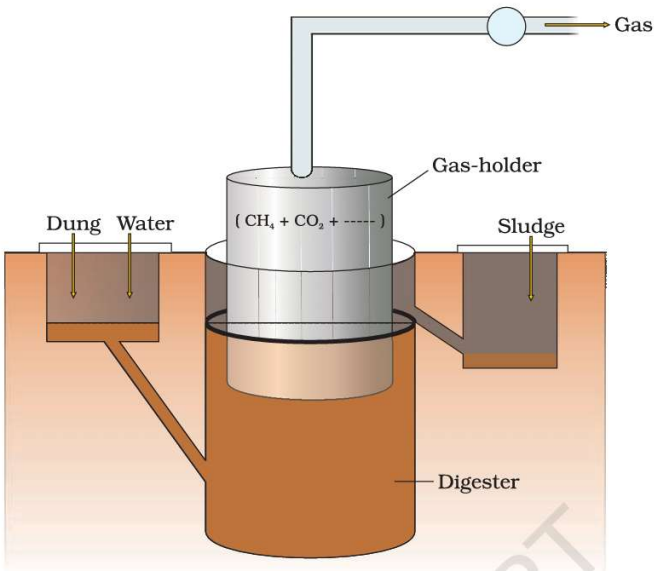
Q. No.	Part no.	Answers	Marks	Total Marks
1.	---	b) n	1	1
2.	---	c) ampulla	1	1
3.	---	d) relaxin	1	1
4.	---	a) AUG	1	1
5.	---	d) viruses	1	1
6.	---	b) <i>Papaver</i>	1	1
7.	---	c) citric acid	1	1
8.	---	c) 6	1	1
9.	---	b) Chitinase	1	1
10.	---	b) 2	1	1
11.	---	d) none of the above	1	1
12.	---	c) 3	1	1

13.	---	In vasectomy, a small part of the vas deferens is removed or tied up through a small incision on the scrotum.	1	1
14.	---	fallopian tube	1	1
15.	---	Antigen-antibody interaction	1	1
16.	---	gold/ tungsten	1	1
17.	---	Commensalism	1	1
18.	---	By reducing the intensity of competition among competing prey species.	1	1
19.	---	d) A is false but R is true.	1	1
20.	---	a) Both A and R are true, and R is the correct explanation of A.	1	1
21.	---	c) A is true but R is false	1	1
22.		Functions of testis: i) formation of sperms ii) secretes androgens Function of ovary: i) formation of ovum ii) secretes estrogens	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	2
	Or			

		i) gonadotropin releasing hormone (GnRH)	$\frac{1}{2}$	
		ii) luteinising hormone (LH)	$\frac{1}{2}$	
		iii) follicle stimulating hormone (FSH)	$\frac{1}{2}$	
		iv) androgens	$\frac{1}{2}$	
23.		Heterochromatin	Euchromatin	2
		• Transcriptionally inactive	• Transcriptionally active	Any two correct difference, 1 each
		• Stains darkly	• Stains lightly	
		• Large in amount	• Small in amount	
		• Densely packed	• Loosely packed	
24.	a)	Myotonic dystrophy	1	2
	b)	Sickle cell anemia/ phenylketonuria/ thalassemia	1	
25.		<i>Trichoderma polysporum</i>	1	2
		It is used as an immunosuppressive agent in organ-transplant patients	1	
26.		The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography is called adaptive radiation.	1	2

		Example: Australian marsupials. A number of marsupials, each different from the other evolved from an ancestral stock, but all within the Australian island continent.	$\frac{1}{2}$ $\frac{1}{2}$	
	Or			
		gene migration or gene flow genetic drift mutation genetic recombination natural selection	Any four $\frac{1}{2}$ each	
27.		fever chills cough headache	$\frac{1}{2}$ each	2
28.		Physical barriers	$\frac{1}{2}$	2
		Physiological barriers	$\frac{1}{2}$	
		Cytokine barriers	$\frac{1}{2}$	
		Cellular barriers	$\frac{1}{2}$	
	Or			
		The agents which cause transformation of normal cells into cancerous neoplastic cells.	1	
		Non-ionising radiation: UV rays	$\frac{1}{2}$	

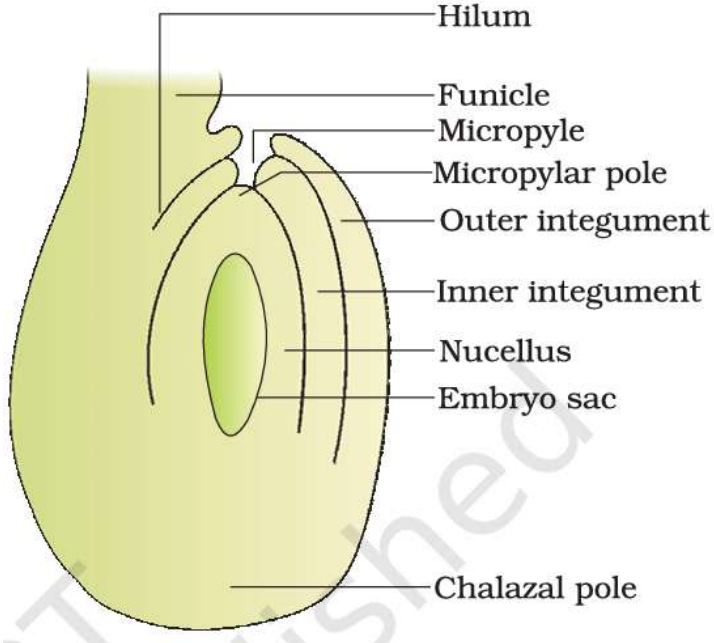
		Ionising radiation: X ray/ Gamma ray	$\frac{1}{2}$	
29.		 The diagram shows a cross-section of a sperm cell. At the top is the 'Head', which contains a 'Nucleus' and is covered by an 'Acrosome'. The head is enclosed by a 'Plasma membrane'. Below the head is the 'Middle piece', which contains several 'Mitochondria'. At the bottom is the 'Tail'.	1 mark of correct diagram, $\frac{1}{2}$ for each correct label (Any four)	3
30.		Wings of butterfly and of birds	1	3
		eye of the octopus and of mammals	1	
		flippers of Penguins and Dolphins	1	

31.		 The diagram illustrates a biogas plant. On the left, a tank contains 'Dung' and 'Water'. A pipe leads from this tank to a central 'Digester'. Above the digester is a 'Gas-holder' containing the gas mixture $(CH_4 + CO_2 + \dots)$. A pipe leads from the gas-holder to a 'Gas' outlet. On the right, a tank contains 'Sludge', with a pipe leading from the digester to it. The entire system is shown in a cross-section view.	1 mark of correct diagram , ½ for each correct label (Any four)	
Or				
		The primary effluent is passed into large aeration tanks where it is constantly agitated mechanically and air is pumped into it. This allows vigorous growth of useful aerobic microbes into flocs. This significantly reduces the BOD of the effluent.	½ ½ ½	3

		The effluent is then passed into a settling tank where the bacterial 'flocs' are allowed to sediment.	$\frac{1}{2}$	
		This sediment is called activated sludge which is pumped into large tanks called anaerobic sludge digesters.	$\frac{1}{2}$	
		Here bacteria which grow anaerobically, digest the sludge and form biogas.	$\frac{1}{2}$	
32.		Biotechnology is controlled use of living organisms for human welfare. or The integration of natural science and organisms, cells, parts thereof, and molecular analogues for products and services.	1	3
		Genetic engineering: Techniques to alter the chemistry of genetic material (DNA and RNA), to	$\frac{1}{2}$	
			$\frac{1}{2}$	

		introduce these into host organisms and thus change the phenotype of the host organism.		
		Bioprocess engineering: Maintenance of sterile ambience in chemical engineering processes to enable growth of only the desired microbe/eukaryotic cell in large quantities.	$\frac{1}{2}$ $\frac{1}{2}$	
33.		Transgenic animals that produce useful biological products such as human protein (α -1-antitrypsin) used to treat emphysema. Similar attempts are being made for treatment of phenylketonuria (PKU) and cystic fibrosis. In 1997, the first transgenic cow, Rosie, produced human protein-enriched milk. The milk contained the human alpha-lactalbumin and was nutritionally a more balanced product for human babies than natural cow-milk.	1 $\frac{1}{2}$ $\frac{1}{2}$ 1	3
	Or			

		Cry proteins are toxic, insecticidal crystal proteins encoded by <i>cry</i> genes.			1	
		<i>Bacillus thuringiensis</i>			1	
		Humans exploit these proteins by incorporating <i>cry</i> genes into transgenic crops (like Bt cotton and Bt corn) to create natural resistance against pests, reducing chemical pesticide use.			1	
34.		Feature	Microsporogenesis	Megasporogenesis		5
		Occurrence	Anther	Ovule	1	
		Size of gametes	Small	Large	1	
		Number of gametes	Large	Small	1	
		Monosporic development	No	Yes	1	
		7-celled, 8-nucleate stage	No	Yes	1	
	Or					

		 Each ovule has one or two protective envelopes called integuments. Integuments encircle the nucellus except at the tip where a small opening called the micropyle is organised. Enclosed within the integuments is a mass of cells called the nucellus. Located in the nucellus is the embryo sac or female gametophyte	1 mark of correct diagram, ½ for each correct label (Any four) ½ ½ ½ ½	
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35.		The human genome contains 3164.7 million bp.	1	5
		The total number of genes is estimated at 30,000	1	
		Less than 2 per cent of the genome codes for proteins.	1	
		Repeated sequences make up very large portion of the human genome.	1	
		Chromosome 1 has most genes (2968), and the Y has the fewest (231).	1	
	Or			
		isolation of DNA	1	
		digestion of DNA by restriction endonucleases,	1	
		separation of DNA fragments by electrophoresis,	1	
		transferring of separated DNA fragments to synthetic membranes and hybridisation using labelled VNTR probe	1	
		detection of hybridised DNA fragments by autoradiography	1	

36.	Characters are controlled by discrete units called factors which occur in pairs. In a dissimilar pair of factors one member of the pair dominates the other.	1	5
	Parents Genotype Phenotype Gametes F₁ Generation Gametes F₂ Generation Genotypic Ratio Phenotypic Ratio	3	
	The heterozygous genotypes in F₁ and F₂ shows dominance of 'T' (Tallness) over 't' (dwarfness).	1	
	Or		
	Any two of following disorders, 2.5 marks for each		
	a) Down's syndrome;	½	

		i) It is due to trisomy of chromosome no. 21	1	
		ii) individual is short statured/ small round head, furrowed tongue and partially open mouth	1	
		b) Klinefelter's Syndrome;	$\frac{1}{2}$	
		i) It is due to an additional copy of X chromosome (karyotype of 47, XXY).	1	
		ii) Gynecomastia / Such individuals are sterile	1	
		c) Turner's Syndrome;	$\frac{1}{2}$	
		i) It is caused due to the absence of one of the X chromosomes, i.e., 45 with X0	1	
		ii) Such females are sterile as ovaries are rudimentary	1	

37.		i) Habitat loss and fragmentation:	$\frac{1}{2}$	5
		This is the most important cause driving animals and plants to extinction. The most dramatic examples of habitat loss come from tropical rain forests.	$\frac{1}{2}$	
		Once covering more than 14 per cent of the earth's land surface, these rain forests now cover no more than 6 per cent.	$\frac{1}{2}$	
		ii) Over-exploitation:	$\frac{1}{2}$	
		Many species extinctions in the last 500 years (Steller's sea cow, passenger pigeon) were due to overexploitation by humans.	$\frac{1}{2}$	
		Presently many marine fish populations around the world are over harvested, endangering the continued existence of some commercially important species.	$\frac{1}{2}$	
		iii) Alien species invasions:	$\frac{1}{2}$	
		When alien species are introduced unintentionally or deliberately for whatever purpose, some of them turn invasive, and	$\frac{1}{2}$	

	cause decline or extinction of indigenous species. The Nile perch introduced into Lake Victoria in east Africa led eventually to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in the lake.	1/2	
	iv) Co-extinctions: When a species becomes extinct, the plant and animal species associated with it in an obligatory way also become extinct.	1/2	
	Or		
	Detritivores (e.g., earthworm) break down detritus into smaller particles. This process is called fragmentation.	1	
	By the process of leaching, water soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts.	1	
	Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism.	1	

		Humification leads to accumulation of a dark coloured amorphous substance called humus that is highly resistant to microbial action and undergoes decomposition at an extremely slow rate.	1	
		The humus is further degraded by some microbes and release of inorganic nutrients occur by the process known as mineralisation .	1	

