


## SAMPLE PAPER 2012-13

### BIOLOGY

### ANSWER KEY

Q.NO.	KEY POINTS	MARKS
1	Offset (1)	1
2.	Failure of segregation of chromatids during cell division/ Non-disjunction of chromosomes during meiosis(1)	1
3.	Helps in improving the nutritional quality of crops	1
4.	Small animals have larger surface area to volume ratio(1/2),tend to loose body heat faster &have to spend more energy to generate body heat through metabolism.(1/2)	1
5.	Exonuclease removes nucleotides from the ends of the DNA(1/2) endonuclease cuts the DNA at specific sites 1/2	1
6.	A- Promoter(1/2) B- Coding strand (1/2)	1
7.	Inhibits ovulation & implantation (1/2),alters the quality of cervical mucus there by retarding/ preventing the entry of sperms(1/2)	1
8.	Lead in the petrol inactivates the catalyist	1
9.	-Temperate regions subjected to frequent glaciations in the past but the tropics remained undisturbed. - Tropical environments are more stablewhen compared to the temperate -More solar radiation available in the tropics,contributing to more productivity and richer species diversity. ( any 2 pts) 1+1	2
10.	a) Curve 'a'(1) b) exponential growth(1/2) Carrying capacity(1/2)	2
11.	Allergy(1/2), allergens(1/2), Mast cells(1/2) histamine and serotonin( any one)(1/2)	2
12.	Isolation of plant cells(1/2), digesting their cell walls(1/2) - isolation of the naked protoplasts(1/2)- Fusion of isolated protoplasts from two plants of desirable quality(1/2)	2
13.	a. aeration tank(1/2) b.vigorous growth of aerobic microbes called flocs (1/2) c.bacterial flocs settle to form activated sludge. (1/2) d.anaerobic digestion results in the production of biogas. (1/2)	2
14.	a. Normal cells show the property of contact inhibition which is lost in the cancer cells. (1) b. Tumour cells have been shown to avoid detection and destruction by the immune system.(1/2) Interferons are biological response modifiers which activate the immune system and destroy the tumour.(1/2)	2
15	Absorb phosphorous and transfer it to the plant(1) Glomus (1)	2

	Streptococcus (1) used as clot buster for removing blood clots from patients who have suffered myocardial infarction.(1)	
16.	a. Commensalism(1/2) b. mutualism (1/2) c. competition(1/2) d. parasitism(1/2)	2
17.	- Unisexual flowers and dioecious plant - Pollen release and stigma receptivity not synchronised - Anther and the stigma of the flower placed in such a way that the pollen from the anther does not fall on the stigma . - Self incompatibility (Any 2 pts.) 1+1	2
18.	ZIFT- After IVF, the zygote / the embryo up to 8 blastomeres is transferred to the fallopian tube(1) IUT- Embryos with more than 8 blastomeres are directly transferred to the uterus (1)	2
19.	 <p style="text-align: right;">2</p> <p>b. Pyramid of number is inverted while pyramid of energy is always upright as energy always flows from one trophic level to the next.( 1)</p>	3
20.	Codon GAA and GAG code for the same amino acid, glutamic acid. The genetic code is degenerate.(1) GUG codes for valine.(1) Mutation B results in a change in the amino acid in the 6 <sup>th</sup> position . This results in a change in the shape to sickle shape(1)	3
21.	a. hn-RNA /heterogenous RNA (1/2) b. Hn RNA contains the coding sequences, the exons and the non coding sequences ,the introns. The mature RNA has only the coding sequences. (1) c.Splicing (1/2), capping (1/2), tailing (1/2)	3
22.	Cow is administered with FSH(1/2) - induces follicular maturation and super ovulation(1/2) - mating with an elite bull or artificial insemination(1/2) - recovery of the fertilised egg at 8-32 celled stage(1/2) - its transfer to the surrogate mother(1/2) - Mother ready for another round of super- ovulation(1/2).	3
23	Adaptive radiation in Marsupials(1) -A process of evolutionof different speciesin a given geographical	3

	area starting from a point and literally radiating to other areas (1) Convergent evolution (1)	
24.	Denaturation, annealing, Extension (1/2 each) Thermostable (1/2) <i>Thermus aquaticus</i> (Correct name with correct way of writing the scientific name.)(1)	3
25.	-Used r-DNA tech to produce human insulin.(1/2) -Prepared 2 DNA sequences corresponding to chain A and Chain B of human insulin and introduced into plasmids of <i>E.coli</i> .(1/2) - Chain A and chain B produced separately.(1/2) - Extracted and combined using disulphide bonds.(1/2)  Functional human insulin is produced as a prohormone and it contains the C- peptide which is absent in the insulin produced by r-DNA tech.(1)	3
26.	Diag with correct sequential labelling	3
27.	RNA i involves silencing of a specific m-RNA due to production of ds RNAmolecule that prevents translationof m-RNA(1) -Nematode specific genes are introduced into tobacco plants using Agrobacterium vectors.(1/2). - Production of sense and anti sense RNA in the host cells.(1/2) - formation of ds RNA.(1/2) - Initiation of RNA I and silencing of the m-RNA of the nematode. .(1/2)	3
28.	a. NCERT Text Page 52 Fig 3.11 b,c,d,e,f,g Diag(1 <sub>1/2</sub> ) and correct labelling zygote, morula,blastocyst(1 <sub>1/2</sub> )  b.After implantation, finger like projections appear on the trophoblast-chorionic villi(1) -It is surrounded by uterine tissue and maternal blood(1/2) -Villi and uterine tissue become interdigitated forming placenta(1/2)  OR  a. NCERT Text Page 26 Fig 2.8 (a) 1 ½ marks ,(b) 1 ½ marks (c) 1 mark b.Only one of the megaspores of the tetrad is functional and it develops into the embryo sac (1)	5
29.	a. GGAA X ggaa (1/2) Gametes GA ga (1/2)  F1 GgAa (1/2)	5

	<p>F2 Punnet square (2)</p> <p>Phenotypic ratio 9:3:3:1 (1/2)</p> <p>b. Law of independent assortment (1)</p> <p style="text-align: center;">OR</p> <p>-The bacteriophage injects only the DNA into the bacterial cells and not the protein coat.(1)</p> <p>- They made 2 different preparations of bacteriophage.In one, DNA was made radioactive with P<sup>32</sup> and in the other the protein was made radioactive with S<sup>35</sup>.(1)</p> <p>Phage allowed to infect bacteria.(1/2)</p> <p>-Agitation in a blender to separate the viral particles from the bacteria.(1/2)</p> <p>- Centrifugation to separate the viral coat and the bacteria. .(1/2)</p> <p>Phages with radioactive protein donot transfer the radioactivity to the bacteria(1/2),</p> <p>-phages with radioactive DNA transfer the radioactivity to the bacteria.(1/2)hence DNA is the genetic material(1/2)</p>	
30.	<p>a. Introduction of Nile perch into Lake Victoria led to the extinction of Cichlid fish in the lake.(1)</p> <p>Many of the native species are threatened by the introduction of Parthenium and Lantana in the Western Ghats.(1)</p> <p>b.- High levels of species diversity(1)</p> <p>- high level of endemism (1)</p> <p>c.-Western Ghats and North Eastern Himalayas(1/2 + 1/2)</p> <p style="text-align: center;">OR</p> <p>a.CFC(1)</p> <p>-Uv rays act on the CFC's releasingCl atoms.(1)</p> <p>- Cl atoms degrade Ozone releasing molecular oxygen.(1)</p> <p>b. UV-B damages DNA and causes mutations. (1)</p> <p>-It causes ageing of skin, damages skin cells and causes various types of cancers.(1)</p>	5