ANNEXURE –A

DAV PUBLIC SCHOOLS, ODISHA ZONE
HALF YEARLY EXAM 2023-24,SUBJECT: BIOLOGY(044), CLASS : XII,SET -02

BLUE PRINT OF QUESTION PAPER

Sl. No.	Units	Marks Allotted in Syllabus	MCQ (12 Nos.)	A&R (4 Nos.)	SA (5 Nos.)	LA-I (7 Nos.)	CASE BASED (2 Nos.)	LA-II (3 Nos.)	TOTAL (33 NOS.)
1	**REPRODUCTION**	18	Q4(1) Q5(1) Q6(1) Q7(1)	Q14(1)	Q18(2)	Q23(3) Q24(3)		Q32(5) OR	9(18)
2	**GENETICS AND EVOLUTION**	24	Q8(1) Q9(1) Q10(1) Q11(1)	Q15(1)	Q19(2) (OR) Q20(2)	Q25(3) Q26(3)	Q30(4)	Q33(5) OR	11(24)
3	**BIOLOGY & HUMAN WELFARE**	14	Q12(1)	Q16(1)	Q21(2)	Q22(3) (OR) Q27(3)	Q29(4)		6(14)
4	**BIOTECHNOLOGY & ITS APPLICATIONS**	14	Q1(1) Q2(1) Q3(1)	Q13(1)	Q17(2)	Q28(3)		Q31(5) OR	7(14)
	MARKS	**70**	**12**	**04**	**10**	**21**	**08**	**15**	**33(70)**

ANNEXURE -B

DAV PUBLIC SCHOOLS, ODISHA ZONE

HALF YEARLY EXAM 2023-24 SUBJECT: BIOLOGY (044) CLASS : XII,SET-02

QUESTION WISE ANALYSIS

SL.NO	Units	Forms of Question - (MCQ ,A & R TYPE, SA, LA-I, LA-II)	Marks Allotted	Question no for (R)& (U), (Ap), (An) (E)&(C),
1	**REPRODUCTION**	MCQ:- 4,5,6,7 A & R:-14 SA:-18 LA-I:-23,24 Case Based:-Nil LA-II:-32	18	(K)& (U):-4,7,18,23,24,32 (Ap):-5 (An) (E)&(C):-6,14
2	**GENETICSAND EVOLUTION**	MCQ:-8,9,10,11 A & R:-15 SA:-19,20 LA-I:-25,26 Case Based:-30 LA-II:-33	24	(K)& (U):-10,11,15,19,33 (Ap):-9,20 (An) (E)&(C):-8,25,26,30
3	**BIOLOGY & HUMAN WELFARE**	MCQ:-12 A & R:-16 SA:-21 LA-I:-22,27 Case Based:-29	14	(K)& (U):-16,21,27,29 (Ap):-12,22 (An) (E)&(C):-NIL
4	**BIOTECHNOLOGY & ITS APPLICATIONS**	MCQ:-1,2,3 A & R:- 13 SA:-17 LA-I:-28 LA-II:-31	14	(K)& (U):-1, (Ap):-2,13,17,28,31 (An) (E)&(C):-3,
TOTAL	33(70)			

Knowledge and understanding – 50% (35 marks)

Applications 30% (21 marks)

Analysis , Evaluate and create 20% (14 marks)

ANNEXURE –C

DAV PUBLIC SCHOOLS, ODISHA ZONE

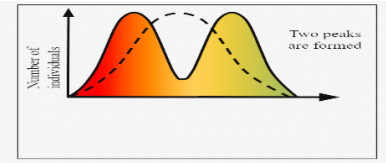
HALF YEARLY EXAM-2023-24, SUBJECT-BIOLOGY CLASS: XII

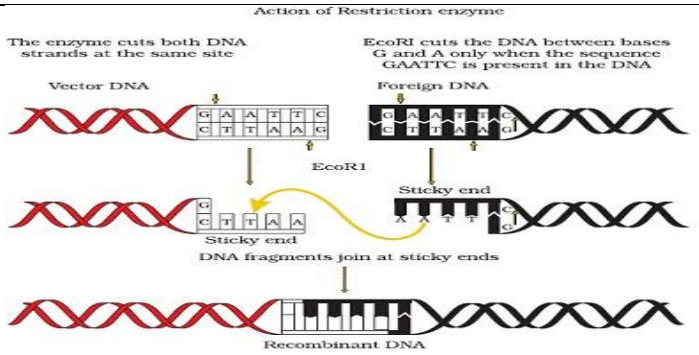
MARKING SCHEME -SET-02

<table>
<tr><th>QSTN NO</th><th>Value Points</th><th>Marks Allotted</th><th>Total Marks</th><th>Page no of old NCERT /Text book</th></tr>
<tr><td></td><td>SECTION -A</td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>b) cryIIAb & cryIAb respectively</td><td>1</td><td>1</td><td>208</td></tr>
<tr><td>2</td><td>b. EcoRI, BamHI,ampR,Ori</td><td>1</td><td>1</td><td>199</td></tr>
<tr><td>3</td><td><table><tr><td>Steps → Options ↓</td><td>I</td><td>II</td><td>III</td></tr><tr><td>a)</td><td>Disarmed retrovirus with ADA gene as cDNA</td><td>Introduction of ADA c-DNA into T-lymphocytes</td><td>Genetically modified T-cells carrying functional ADA gene</td></tr></table></td><td>1</td><td>1</td><td>211</td></tr>
<tr><td>4</td><td>c) Nucellus</td><td>1</td><td>1</td><td>25</td></tr>
<tr><td>5</td><td>a) being a diploid tissue</td><td>1</td><td>1</td><td>36</td></tr>
<tr><td>6</td><td><table><tr><td>(d)</td><td>Trophoblast</td><td>Inner cell mass</td><td>get attached to the endometrium</td><td>differentiated as embryo</td></tr></table></td><td>1</td><td>1</td><td>52</td></tr>
<tr><td>7</td><td>a)Point P</td><td>1</td><td>1</td><td>61</td></tr>
<tr><td>8</td><td>c) both hybrid and light DNA</td><td>1</td><td>1</td><td>105</td></tr>
<tr><td>9</td><td>b)Gynaecomastia</td><td>1</td><td>1</td><td>90</td></tr>
<tr><td>10</td><td>d) A-iv, B-iii, C-i, D-ii</td><td>1</td><td>1</td><td>112,117</td></tr>
<tr><td>11</td><td>a) Convergent evolution.</td><td>1</td><td>1</td><td>134</td></tr>
<tr><td>12</td><td>c) Macrophages- Mucus-secreting cells that trap microbes entering the body.</td><td>1</td><td>1</td><td>150</td></tr>
</table>

13	b) Both A and R are true but R is not the correct explanation of A.	1	1	202
14	c. A is true but R is false	1	1	38
15	a. Both A and R are true and R is the correct explanation of A.	1	1	85
16	d. A is false but R is true	1	1	188
17	**SECTION -B** In 1983, Eli Lilly an American company prepared two DNA sequences corresponding to A and B chains of human insulin, introduced them in plasmids of *E. coli* to produce insulin chains, Chains A and B were produced separately, extracted and combined by creating disulphide bonds to form human insulin.	½ x 4	2	204
18	a) Ovulation, LH b) Corpus luteum, Progesterone	½x4	2	51
19	a) B- Transcription, cytoplasm b)3'-5' c)Nucleotide triphosphates OR a) Cross B, the strength of crossing over is high. - If distance between two genes present in one chromosome is more, occurrence of crossing over is more, if distance is less between two genes, occurrence of crossing over is less. b) Cross A- genotypes of recombinant female: y+y w+ w Cross B- genotype of recombinant male: w+wm+m	½x2 ½ ½ ½ ½ ½ ½	2 2	109 136,137
20	a. Divergent evolution. In these animals same structure developed along different directions due to adaptations to different needs. b. Thorn of Bougainvillea and tendril of Cucurbita (any other related examples)	½ 1 ½	2	75
21	A-Sporozoite B-Asexual reproduction C-Haemozoin D-Gut of Mosquito	½ x4	2	148

22	**SECTION C** a) The first infection of chicken pox produces a primary response and antibodies are generated against chicken pox virus, subsequent encounter with the same virus elicit a highly intensified secondary response, due to the memory cells formed during the first encounter. This kind of immunity is active immunity. b) Tetanus is caused by a microbe which has a deadly and fast action. Action of vaccine is slow and which may be fatal. OR (i) The chemical nature of the coat: Viral protein coat. (ii) Enzyme B - reverse transcriptase X: viral RNA introduced into a cell, C = Viral DNA. (iii) Host cell (D) = Macrophage. (iv) helper T-lymphocytes.	½x3 ½ ½x2 ½ ½ x3 ½ ½	3 3	152 155
23	a)A-implants, B-Copper-T a) Implants inhibit ovulation and implantation as well as the quality of cervical mucus to prevent /retard entry of sperms Release of cu ions suppresses the sperm motility and the fertilizing capacity of sperms. b) All RTIs are spread by sexual contacts. Thus, all RTIs are STDs. Example-Syphilis But All STDs are not RTIs as they don't affect reproductive tracts. Example: HIV, Hepatitis B or C	½+½ ½ ½ ½+½	3	60 61
24	a)P-Thalamus,Q-Seed,R-Endocarp, S-Mesocarp b)False fruit, formed from thalamus other than ovary	½ x 4 ½+½	3	37
25	DNA Fingerprinting i.Isolation of DNA ii.Digestion of DNA into small fragments by RE iii.Separation of DNA bands by gel electrophoresis iv.Transfer to nitrocellulose membrane(Blotting) v.Hybridisation with labelled VNTR probes and Autoradiography	½ ½x5	3	121
26	a) Genetic drift. Sometimes the change in allele frequency is so different in the new sample of population that they become a different species/	½ ½	3	133

	The original drifted population becomes founders and the effect is called founder effect. b)p2+2pq +q2=1 c)More individuals acquire peripheral character value at both ends of distribution curve  Fig: Disruptive selection	½ 1 ½		
27	a) The primary effluent is continuously agitated. To allow the growth of aerobic microbes. b) A small amount of activated sluge serves as inoculum for the aeration tank and rest of it is transferred to anaerobic sludge digester for anaerobic respiration. c) The major part of the activated sludge is pumped into large tanks called **anaerobic sludge digesters** where methanogens grow anaerobically, digest the bacteria and the fungi in the sludge and produce biogas.	½x2 ½x2 ½x2	3	184
28.	a) DNA is negatively charged hence move from cathode to anode. b) Agarose. obtained from sea weed c) Stained with Ethidium bromide, expose to UV rays, Elution	½ ½x2 ½x3	3	198
29.	**SECTION -D** a) Flowering branch of *Datura* species, hallucinogens b) Treatment of insomnia and mental depression. c.– *Erythroxylum cocca*,Interferes with dopamine secretion central nervous system,hallucination OR Smack, acetylation of morphine Opioids, Depressant/slows down body functions.	½x2 ½x2 ½x2 ½x2 ½x2 ½x2	4	159
30.	(a) This representation is of beta globin chain of haemoglobinIn a normal person the mRNA possesses the codon GAG which codes for glutamic acid. (b) In the sufferer, the GAG is replaced by GUG in the mRNA which codes for valine, point mutation (c) Glutamic acid is replaced by valine during translation, due to which RBC would be sickle-shaped. Autosomal,recessive disorder OR (c) Both, As it is an autosomal disease both male and females are equally affected. Hb^AHb^s , Hb^sHb^s	½x2 ½x2 1 ½x2 ½x4	4	89

31.	 b)A recombinant DNA is inserted within the coding sequence of an enzyme beta-galactosidase, which results in **insertional inactivation**, The presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert, Presence of insert results into insertional inactivation and the colonies do not produce any colour which are identified as recombinant colonies. Or a) 27 varities b) The 'new' variety of Basmati has been developed by crossing the Indian Basmati variety with the semi-dwarf varities of the U.S c) Neem and turmeric d) – It is called biopirarcy. - Biopirarcy refers to the use of bioresources by multinational companies and other organisations without proper authorization from the countries and people without compensatory payment. e) -India has framed the Indian Bill -Recently, the parliament has cleared the second amendment of the Indian Patent Bill.	½ x 6 Any six correct labellings ½ x 4 ½ 1 ½ x 2 ½ 1 1	5 5	196 202 214

32.	a.Only one sperm(that has entered zona pellucida) shall enter in to the ovum .Others will be degenerated. b.Prevents polyspermy c.Completes meiosis II, to form egg , second polar body. d.Sperm lysin/Enzymes present in acrosome e.Ampullary region of fallopian tube ,zygote,2n OR a)Bagging- The gynoecium of pistillated flower should be covered by polythene bag before maturation. ↓ When the ovary matured, the bag is removed. ↓ The desired pollen grains collected are dusted over the stigma and re-bagged to avoid contamination with unwanted pollen grains. Artificial hybridization/controlled pollination. b)Self-incompatibility This is a genetic mechanism and prevents self-pollen (from the same flower or other flowers of the same plant) from fertilising the ovules by inhibiting, pollen germination or pollen tube growth in the pistil. c)In chasmogamous flower, the anther and stigma are exposed. No. Cleistogamous flower are closed flower, anther and stigma remain inside. So no cross pollination.	½+½ ½ ½x3 ½ ½x3 ½x4 ½ ½x2 ½x3	5 5	26 31,33
33.	(a) Bacteriophage, because they transfer their genetic material in to bacteria during infection. (b) They used radio active phosphorous & radio active sulphur to prove that whether DNA or protein is the genetic material. Viruses grown in radioactive phosphorous had radioactive DNA as phosphorous is a part of DNA & Viruses grown in radioactive sulphur had radioactive protein as sulphur is a part of protein. (c) A blender was used to separate the viral coat from bacterial cells & centrifuge was used to separate the viral particles from bacterial cells. (d) DNA is the genetic material.	½ x 2 ½ 1 1 ½ x 2 ½	5 5	102

	OR a).Phenotype-Tall Yellow, Genotype-TtYy b)Phenotypes- Tall yellow, Tall green, Dwarf yellow, Dwarf green Phenotypic ratio-9:3:3:1 c) TY,Ty,tY,ty d) Law of independent assortment. When two pairs of traits are combined in a hybrid the segregation of one pair of characters is independent of the other pair of characters. Correct Punnet Square for F_2 generation	½ x 2 ½ x 2 ½ ½ 1 1	5	79