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| **HY/BIAK/1222/C 12-SEP-2022** | | | | |
| **HALF YEARLY EXAMINATION (2022-23)** | | | | |
| **Subject: Biology (ANSWER KEY)**  **Grade: XII** | | Max. Marks:70Time: 3 hrs | | |
|  | **SECTION A** | |  |
| 1 | a | | 1 |
| 2 | b | | 1 |
| 3 | c | | 1 |
| 4 | b | | 1 |
| 5 | a | | 1 |
|  | **SECTION B** | |  |
| 6 | Chromosomes other than sex chromosomes. | | 1 |
| 7 | a-6,b-4 | | 1 |
| 8 | Autosomal dominant-1/2, Never skips a generation-1/2 | | 1 |
| 9 |  | | 1 |
| 10 | After addition of lactose **complete breakdown of lactose to glucose and galactose takes place**. Therefore there is no more lactose to bind to the repressor protein and the lac operon shuts down. | | 1 |
|  | **SECTION C** | |  |
| 11 | *Mirabilis jalapa*/antirrhinum/dog flower- the flower colour-1 Mark  Explanation-1 Mark | | 2 |
| 12 | 1/2\*4 | | 2 |
| 13 | 1)sterile female 2)poorly developed breast 3)short stature. 4) small uterus | | 2 |
| 14 |  | | 2 |
| 15 | a-b=3’-5’,c-d=5’-3’ | | 2 |
| 16 | Color blind man(XcY),Normal man(XY),two carrier women(XcX) | | 2 |
| 17 | (1+1)  **OR** | | 2 |
| 18 | hnRNA contains both coding and non coding sequences called exons and introns respectively.The introns need to be removed to make it functional mRNA.so splicing is needed. | | 2 |
| 19 | DNA-Chemically less reactive and structurally more stable-factors that make DNA more stable. | | 2 |
| 20 |  | | 2 |
|  | **SECTION D** | |  |
| 21 | It is a system to study the distribution and movement of traits in a series of generation in a family. Sex linked disorders like Haemophilia and colour blindness will be identified and treated by Pedigree . | | 3 |
| 22 | Round and Yellow,Parents-RrYy,9:3:3:1,Reason-Law of independent assortment. | | 3 |
| 23 |  | | 3 |
| 24 |  | | 3 |
| 25 | Human genome project was aimed to determine the complete base sequence of human DNA.  Human genome project is called a mega project because (i) Its aim was to determine the nucleotide sequence of complete human genome which was a task of enormous magnitude. (ii) a total of 3×109 base pairs were to be sequenced and the cost was about 9 billion US dollars. (iii) it required bioinformatics data base techniques and other contemporary devices for the analysis, storage and retrieval of information. (iv) many countries worked jointly to complete this timed project. | | 3 |
| 26 | **OR** | | 3 |
| 27 | A medical term for having an extra copy of a chromosome is 'trisomy. ' Down syndrome is also referred to as **Trisomy 21**. This extra copy changes how the baby's body and brain develop, which can cause both mental and physical challenges for the baby. | | 3 |
| 28 | Explanation-2 marks,Diagram-1 Mark | | 3 |
| 29 | Francis Crick postulated tRNA as an adapter molecule.(1)It has amino acid binding site at 3’ end .(2)It has anticodon to recognize the codon on mRNA for the amino acid.  **OR**  a.Transcription level, Processing level ,Transport of mRNA to cytoplasm , Translation level.  b. Gene i . ½\*4+1 | | 3 |
| 30 |  | | 3 |
|  | **SECTION E** **(Case Based)** | |  |
| 31 | 1. Gel Electrophoresis (1) 2. Satellite DNA (1)   Isolating the DNA.  ↓  Digesting the DNA with the help of restriction endonuclease enzymes.  ↓  Separating the digested fragments as per the fragment size by the process of electrophoresis.  ↓  Blotting the separated fragments onto synthetic membranes like nylon.  ↓  Hybridising the fragments using labelled VNTR probes.  ↓  Analysing the hybrid fragments using autoradiography. (2)   1. No (1) | | 5 |
| 32 | 1. Non clotting of the blood / Loss of major volume of blood during menstruation/ Lack of the coagulating protein(1) 2. Males have only one X chromosome and one Y chromosome, so if they inherit a copy of the faulty X chromosome that carries hemophilia from their mother, they will develop the disorder. (2) 3. Affected gene is only found on one X chromosome. Mother may inherit normal X chromosome to the new generation. Offsprings will be heterozygous genotype.(1) 4. Red and green(1) | | 5 |

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