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| **B** | | | | | |
| **HY/BI/1220/B 19/11/2020** | | | | | |
| **HALF YEARLY EXAMINATION (2020-21)** | | | | | |
| **Subject: BIOLOGY**  **Grade: XII** | | Max. Marks: 70Time:3 Hours | | | |
| **Name:** | | | **Section:** | **Roll No:** | |
| **General Instructions:**   * *This paper consists of 8 pages* * *All questions to be attempted, internal choices are given.* * *Section A has questions from 1-16 of one mark each* * *Section B has questions from 17-25 of two marks each* * *Section C has questions from 26-30 of 3 marks each* * *Section D has questions from 31-33 of 5 marks each* * *All answers to be written in the answer sheet provided.* | | | | | |
|  | **SECTION A** | | | |  |
| 1 | Shivering and chills are a very significant symptom of malaria. Why does the patient suffer from this? | | | | 1M |
| 2 | RNA viruses mutate and evolve faster than other viruses. Why? | | | | 1M |
| 3 | Some enzymes are considered as molecular scissors in genetic engineering. What is the name assigned to such enzymes? | | | | 1M |
| 4 | 1. What is the cross between the progeny of F1 and the homozygous recessive parent called? How is it useful? | | | | 1M |
| 5 | 1. Name the part of gynoecium that determines the compatible nature of pollen grain. How does it do this function? | | | | 1M |
| 6 | 1. Fill in the numbers in spaces marked as A and B. 2. The codon is triplet, \_\_A\_\_\_ codons code for amino acids and \_\_B\_\_\_ codons function as stop codons. | | | | 1M |
| 7 | How is a GMO different from a hybrid crop? | | | | 1M |
| 8 | Indicate the type of division taking place in 1 and 2 | | | | 1M |
| 9 | A bacterial cell is shown in the figure given below. Label the part A and B. Also mention the use of part A in rDNA technology. | | | | 1M |
| 10 | 1. Identify the type of carpel with the help of diagrams given below: Sexual Reproduction in Flowering Plants | | | | 1M |
| 11 | **Assertion-** When experiments peas were repeated using other traits in other plants, it was found that F1 had a phenotype that did not resemble either of the two parents and was in between the two.  **Reason-** The phenotype will only be dependent on the functioning of unmodified allele. The unmodified allele which represents the original phenotype is the dominant allele and modified allele is the recessive allele.   1. Both assertion and reason are true, and the reason is the correct explanation of the assertion. 2. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. 3. Assertion is true but reason is false. 4. Both assertion and reason are false | | | | 1M |
|  | OR | | | |  |
|  | **Assertion-** Haemophilia is a sex-linked recessive disease, which shows its transmission from unaffected carrier female to some of the male progeny.  **Reason-** The possibility of a female becoming a haemophilic is greatbecause mother and father both of such a female must be haemophilic.   1. Both assertion and reason are true, and the reason is the correct explanation of the assertion. 2. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. 3. Assertion is true but reason is false. 4. Both assertion and reason are false. | | | |  |
| 12 | **Assertion**- During DNA replication, both the strands are copied.  **Reason**- both strands act as a template they would code for RNA molecule with different sequences and more proteins will be made.   1. Both assertion and reason are true, and the reason is the correct explanation of the assertion. 2. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. 3. Assertion is true but reason is false. 4. Both assertion and reason are false. | | | | 1M |
| 13 | **Assertion-**During fertilization a sperm comes in contact with zona pellucida and induces changes that block the entry of additional sperms.  **Reason-** This is to avoid polysomy.   1. Both assertion and reason are true, and the reason is the correct explanation of the assertion. 2. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. 3. Assertion is true but reason is false. 4. Both assertion and reason are false. | | | | 1M |
| 14 | **Assertion-** The vaccination or immunization works on the property of memory of the immune system.  **Reason-**The passive vaccine contains performed antibodies against the pathogen.   1. Both assertion and reason are true, and the reason is the correct explanation of the assertion. 2. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. 3. Assertion is true but reason is false. 4. Both assertion and reason are false. | | | | 1M |
| 15 | In 1981, many cases of this illness were reported in gay men, so it was termed GRID (Gay-Related Immune Deficiency) and many people were dying from it. Soon the name was changed to AIDS (Acquired Immune Deficiency Syndrome). In late 1995, new drugs became available that changed the path of the epidemic. For the first time, in 1996, the number of people dying from AIDS finally began to decrease. Govt programs were run that gave sterile needles to people.With new treatments that combined different drugs, fewer people were dying from HIV. Today, there is still no vaccine or cure for HIV, but treatment is very effective. For many people, treatment for HIV has few or no side effects and is as simple as taking one pill, once a day. | | | | 4M |
|  | **ATTEMPT ANY FOUR** | | | |  |
|  | HIV attacks a certain kind of cell in the immune system. Which cells are these? | | | |  |
|  | 1. Red blood cells | | | |  |
|  | 1. White blood cells called T cells | | | |  |
|  | 1. Platelets | | | |  |
|  | 1. B lymphocytes | | | |  |
|  | AIDS was called an epidemic because- | | | |  |
|  | 1. When many people get sick from an illness in the same area at the same time, it is called an epidemic | | | |  |
|  | 1. Whenever there is a new disease reported, it is called an epidemic | | | |  |
|  | 1. There is no cure to the disease | | | |  |
|  | 1. There is not a vaccine developed yet | | | |  |
|  | Why was the name changed from GRID to AIDS? | | | |  |
|  | 1. The disease spreads through air, water and food. | | | |  |
|  | 1. The new cases were among people who were in close contact of people earlier detected with the infection. | | | |  |
|  | 1. The disease spreads through blood transfusions, and from mother to the baby as well during pregnancy and lactation. | | | |  |
|  | 1. It causes the deficiency of some substances in the body. | | | |  |
|  | The number of deaths due to AIDS reduced even when there is no vaccine available. This is because- | | | |  |
|  | 1. People are more aware of causes and spread of the disease | | | |  |
|  | 1. Medicines are available for the treatment | | | |  |
|  | 1. Government has provided sterile needles to people who use drugs. | | | |  |
|  | 1. All of the above | | | |  |
|  | How are AIDS and HIV different from each other | | | |  |
|  | 1. HIV is a virus that only affects human beings and AIDS is a late stage of HIV disease | | | |  |
|  | 1. HIV is a virus that causes the diseases and AIDS is the test conducted to detect the disease. | | | |  |
|  | 1. HIV reduces the immunity of the person and AIDS makes the person more sick | | | |  |
|  | 1. AIDS is the program run to aid people suffering from the disease and HIV is the disease. | | | |  |
| 16 | Because of the intricate feedback loops controlling the menstrual cycle, artificially altering one or two hormones can affect the entire cycle. This fundamental knowledge has been used both to suppress the cycle, with the goal of contraception, as well as to stimulate ovulation with the hopes of promoting fertility. Two ideal targets for hormonal contraception would be the hormones FSH and LH, which play dual roles in the normal menstrual cycle, first re-starting the cycle after menstrual bleeding and then triggering ovulation at the mid-point of the cycle. Because FSH and LH are required to trigger ovulation, artificially blocking these two hormones would therefore robustly suppress ovulation. However, the standard combined oral contraceptive consists of both hormones P and E, taken daily for three weeks, followed by a week of no pills (or placebo pills) that trigger what’s known as “breakthrough bleeding”. Although the outward appearance is the same (menstrual bleeding in week 1 of a 28 day cycle) the constant high levels of P and E for a woman taking the Pill actually abolish the normal hormonal cycling that underlies ovulation. The Pill therefore replaces the normal menstrual cycle with an artificial cycle (3 weeks of “mimicking pregnancy”, followed by 1 week with breakthrough bleeding). | | | | 4M |
|  | **ATTEMPT ANY FOUR** | | | |  |
|  | Why are the hormones P and E commonly used in the Pill? | | | |  |
|  | 1. P and E suppress the release of FSH and LH | | | |  |
|  | 1. FSH is required for inner lining of uterus | | | |  |
|  | 1. LH needs to be controlled as it promotes the lactation. | | | |  |
|  | 1. P is released form ovary and is needed for pregnancy | | | |  |
|  | How do pills mimic pregnancy? | | | |  |
|  | 1. Constant FSH and LH hormone levels are maintained during pregnancy | | | |  |
|  | 1. Constant low level of FSH and high level of LH is needed in pregnancy | | | |  |
|  | 1. Constant high levels of P and E which are seen in normal pregnancy | | | |  |
|  | 1. Constant high level of P and low level of E is maintained in pregnancy | | | |  |
|  | What are factors that can cause absence of periods? | | | |  |
|  | 1. stress | | | |  |
|  | 1. pregnancy | | | |  |
|  | 1. poor health | | | |  |
|  | 1. all of the above | | | |  |
|  | Why does breakthrough bleeding on placebo pill occur? | | | |  |
|  | 1. Drop in P and E hormone levels causes endometrium lining to break | | | |  |
|  | 1. Drop in FSH and LH causes ovulation causes endometrium lining to break and result in bleeding | | | |  |
|  | 1. LH surge is caused which results in bleeding | | | |  |
|  | 1. Increased levels of FSH cause follicle to be released and that causes bleeding | | | |  |
|  | What is the duration of normal cycle and when is the LH surge observed? | | | |  |
|  | 1. 30, 15 | | | |  |
|  | 1. 28, 14 | | | |  |
|  | 1. 35, 20 | | | |  |
|  | 1. 45, 20 | | | |  |
|  | **SECTION B** | | | |  |
| 17 | 1. Many secondary metabolites of plants have medicinal properties. It is their misuse that creates problems. Justify the statement with an example. | | | | 2M |
| 18 | 1. Give any four features of the human genome. | | | | 2M |
| 19 | 1. There is only one possible sequence of amino acids when deduced from a given nucleotides. But multiple nucleotides sequence can be deduced from a single amino acid sequence. Explain this phenomenon. | | | | 2M |
| 20 | Study the figures given below and answer the question.    Identify in which of the crosses is the strength of linkage between the genes higher. Give reasons in support of your answer. | | | | 2M |
|  | OR | | | |  |
|  | 1. Label the amino acid at A and write the name of RNA below. 2. Name the process in which this RNA helps. | | | |  |
| 21 | Given below is the diagram of agarose gel kept under UV light:    a) Mark the positive and negative terminals.  b) What is the charge carried by DNA molecule and how does it help in its separation?  c) How are the separated DNA fragments finally isolated? | | | | 2M |
| 22 | Draw a well labeled diagram of a young anther and mark the following in the same-   1. Connective 2. Sporogenous tissue 3. Tapetum | | | | 2M |
|  | OR | | | |  |
|  | Depict through diagrams, how a microspore gets matured into a pollen | | | |  |
| 23 | 1. How is a mature, functional insulin hormone different from its prohormone form? How is prohormone converted into functional insulin? | | | | 2M |
| 24 | Both nucellus and endosperm have abundant reserve food materials. How is their food reservoir utilized in angiosperms? | | | | 2M |
| 25 | A person is born with a hereditary disease with a weakened immune system due to deficiency of an enzyme. Suggest a technique for complete cure for this disease, identify the deficient enzyme and explain the technique used for cure. | | | | 2M |
|  | **SECTION C** | | | |  |
| 26 | Since DNA is a hydrophilic molecule, it cannot pass through cell membranes. Name and explain the technique with which the DNA is forced into   1. a bacterial cell 2. a plant cell 3. an animal cell. | | | | 3M |
| 27 | True-breeding pea plants showing contrasting character for flower position were cross-bred.  a) Mention the position of flowers in F1 generation.  b) Work out the cross up to F2 generation.  c) Compute the relative fraction of various genotypes in the F2 generation? | | | | 3M |
| 28 | CryIAbis introduced in a plant to prevent infestation by corn borer.  a) What is the resultant plant referred as?  b) Summarize the action of the gene introduced. | | | | 3M |
| 29 | Continued self-pollination leads to inbreeding depression. How do plants overcome this problem? List three devices, which flowering plant have developed for the same. | | | | 3M |
| 30 | Identify and explain steps ‘A’, ‘B’ and ‘C’ in the PCR diagram given below. | | | | 3M |
|  | OR | | | |  |
|  | Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following question  – 5´ – CAGAATTCTTA – 3´  -3´ – GTCTTAAGAAT – 5´   1. Name a restriction enzyme which can recognize this DNA sequence. 2. Write the sequence after digestion. 3. Why are the ends generated after digestion called sticky ends? | | | |  |
|  | **SECTION D** | | | |  |
| 31 | 1. In humans, males are heterogametic and females are homogametic. Explain. 2. Are there any examples where males are homogametic and females heterogametic? 3. Also describe as to, who determines the sex of an unborn child in humans? 4. Mention whether temperature has a role in sex determination. | | | | 5M |
|  | OR | | | |  |
|  | 1. A normal visioned woman, whose father is colour blind, marries a normal visioned man. What would be probability of her sons and daughters to be colour blind? Explain with the help of a pedigree chart. | | | |  |
| 32 | 1. With the help of diagrams, give an account of post transcriptional modifications of a eukaryotic mRNA. | | | | 5M |
|  | OR | | | |  |
|  | 1. Discuss the process of translation in detail with a brief description of the site of the process. | | | |  |
| 33 | 1. The zygote passes through several developmental stages till implantation, Describe each stage briefly with suitable diagrams. | | | | 5M |
|  | OR | | | |  |
|  | * 1. Draw a neat diagram of the female reproductive system and label the parts associated with the following   2. production of gamete   3. site of fertilization   4. site of implantation and   5. birth canal   6. What are the roles played by the middle layer of uterus and fimbriae? | | | |  |

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