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| **PRE BOARD EXAMINATION (2020-21)**  **G** | | |
| **PB/BIAK/1220/B 10/12/2020** | | |
| **SUBJECT:BIOLOGY**  **GRADE:XII**  **ANSWER KEY** | | |
|  | **SECTION A** |  |
| Ans 1 | More generations can be studied in a short period of time. | 1m |
| Ans 2 | As A = 31%T = 31% as A = TA + T = 62%G + C = 100-62 = 38%C Cytosine = 19% = 19% as C = G | 1m |
| Ans 3 | It is because the secondary immune response takes place when our body encounters the same antigen second time. The B- cells and T- cells are already present against the antigen and more cells are rapidly activated. During the primary immune response, the body encounters the infective agent for the first time and thus action of body is slow. | 1m |
| Ans 4 | Sigma factor acts as an initiation factor. Rho factor on the other hand is responsible for termination of transcription | 1m |
| Ans 5 | 1. International Union for Conservation of Nature and Natural Resources | 1m |
| Ans 6 | 1. In MOET cow is given hormones with FSH like activity. These hormones induce follicular maturation and super-ovulation which produces 6–8 eggs per cycle instead of one egg. | 1m |
| Ans 7 | ATP | 1m |
| Ans 8 | dN/dt=rN(K-N/K) | 1m |
| Ans 9 | Cellulase: animal cells don’t have cell wall which is made up of cellulose. | 1m |
| Ans 10 | Spirulina and Methylophilus methylotrophus | ½+1/2m |
| Ans11 | d- the assertion is false but reason is true | 1m |
|  | OR |  |
| Ans 11OR | b-Both assertion and reason are true, but the reason is not the correct explanation of the assertion | 1m |
| Ans 12­ | 1. Both assertion and reason are true, and the reason is the correct explanation of the assertion. | 1m |
| Ans 13 | 1. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. | 1m |
| Ans 14 | **c-** Assertion is true but reason is false. | 1m |
| 15-Ans i | 1. malaria | 1m |
| Ans ii | d- A and B | 1m |
| Ans iii | c-Rupture of RBCs that releases a chemical | 1m |
| Ans iv | b- Female Anopheles | 1m |
| Ans v- | c- sporozoites | 1m |
| Ans i | d-All of the above | 1m |
| 16- Ans ii | * a- Y-axis | 1m |
| Ans iii | d-S = species richness; C = Y intercept; Z = slope of the line; A = area | 1m |
| Ans iv | c-Both of the above | 1m |
|  | 1. The graph does not cross (0,0) |  |
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|  | **SECTION B** |  |
| Ans 17 | Apple is a false fruit because they are not matured ovaries from flower. Fruits that develops from floral parts are called false fruits. Mangoes are fruits that develop from the flower ovaries  OR | 2m |
|  | Draw a diagram of an enlarged view of T.S. of one microsporangium of an  angiosperm and label the following parts - Sarthaks eConnect | Largest  Online Education Community |  |
| Ans 18 | inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent/retard the entry of sperms. | 1+1m |
| Ans 19 | Multiple allelism; ABO blood groups | 1+1m |
| Ans 20 | (a) to get rid of unwanted pregnancies. (b) it is also essential when the foetus is suffering from an incurable disease or when continuation of the pregnancy could be harmful or even fatal to 'he mother and or foetus. | 1+1m |
| Ans 21 | Draw a well - labelled diagram of an antibody molecule. | 2m |
| Ans 22 | 1. In down syndrome autosomes are affected and in turner syndrome, sex chromosomes are affected. 2. In down syndrome, person has an additional copy of chromosome number 21 which is called trisomy while in turner syndrome one X chromosome is absent in the person | 1+1m |
| Ans 23 | If the slurry of cow dung and water is fed into the biogas plant there is no need to provide inoculum for biogas production because the cow dung or excreta of cattle in itself contain a large number of anaerobic methanogenic bacteria. Therefore the slurry cow dung and water can be used for generation of biogas.These bacteria breakdown the cellulosic material present in the rumen of cattle anaerobically and produce large amount of methane along with CO2 and water. | 2m |
| Ans 24 | 1. Early detection, Molecular diagnostics is a more sensitive method allowing detection of lower amounts of infectious agents, can detect mutations in genes also in suspected cancer patients | 2m |
| Ans 25 | a) ‘X’ axis - Mean annual precipitation (cm) ½ x 2 = 1 ‘Y’ axis - Mean annual temperature (0 C) b) Grassland - B ½ x 2 = 1 Coniferous forest - E | 2m |
| OR | Sunken stomata and CAM pathway | 1+1m |
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|  | **SECTION C** |  |
| Ans 26 | 1. The endosperm development precedes embryo development. The developing embryo requires nutrition for its development that is provided by the endosperm | 1+2 |
| Ans 27 | **Drosophila** melanogaster.  **Morgan preferred to work with fruit**-**flies** because:  Readily available and can be reared and bred under laboratory conditions.  It **has** a short life span which **is** around 2 weeks and can be bred throughout the year and numerous generations can be obtained.  Females can be easily distinguished from males by their large body size.  It had many types of genetic variations that can be easily studied. | 1+1/2x4 |
| Ans 28 | Rhizobium - Symbiotically Fix atmospheric nitrogen into organic forms which can be used by the plant as nutrients Azospirullum / Azotobacter - free living bacteria fix atmospheric nitrogen Glomus / Fungi - Symbiotic with plants absorbs phosphorus from soil and passes it to plant Cyanobacteria / Anabaena / Nostoc / Oscillatoria - fix atmospheric nitrogen in acquatic and terrestrial environment Blue green algae - add organic matter to soil and increase soil fertility | 3m |
| Ans 29 | use of someone's bioresources without any systemic permission is **biopiracy**.  Example- basmati rice is famous for its aroma and taste and is being grown in India for many years but an American company took its patent rights. | 1+1 |
|  | OR |  |
|  | The bacteria in which genes of interest (through foreign DNA) are introduced eg Eco1 when 2 DNA sequences A and B chains of insulin are introduced into plasmid of this bacteria, then it is called transgenic bacteria and starts to produce insulin chain. | 1+1m |
| Ans 30 | 1. Small animals have larger surface area relative to their volume. They tend to lose body heat very fast when it is cold outside. They have to spend much energy to generate body heat through metabolism. This is the reason, why polar regions are not a suitable habitat for tiny humming birds. | 1+2m |
|  | **SECTION D** |  |
| Ans 31 | A - Estrogen ½ x 2 = 1 B - Progesterone b) A - Maturing ovarian follicle / Graafian follicle ½ x 2 = 1 B - Corpus luteum c) Formation of Graaffian follicle (releases estrogen) is followed by the formation of corpus luteum (releases progesterone) 1 d) Role of A (Estrogen) - leads to changes in the ovary and uterus / regeneration of endometrium through proliferation ½ Role of B (Progesterone) - Maintenance of endometrium for implantation of the 5 fertilized ovum/ maintenance of other events of pregnancy ½ e) In case of pregnancy 1 | 5m |
|  | OR |  |
| Ans 31 OR | a) A is able to penetrate/ fertilize the ovum, whereas B and C are unable to penetrate/ fertilize // B and C will degenerate ½ x 2 = 1 b) Zona pellucida ensures the entry of only one sperm into the ovum 1 c) Induces completion of meiotic division of the secondary oocyte, formation of second polar body and a haploid ovum ½ x 2 = 1 d) Enzymes of acrosome help (½ mark if only ‘acrosome’ is written) 1 e) Ampullary - isthmic junction of the fallopian tube 1 | 5m |
| Ans 32 | Meselson and Stahl, performed an experiment using E.coli to prove that DNA replication is semi conservative  . – They grew E.coli in a medium containing 15NH4Cl.  – Then separated heavy DNA from normal (14N) by centrifugation in CsCl density gradient.  – The DNA extracted, after one generation of transfer from 15N medium to 14N medium, had an intermediate density.  – The DNA extracted after two generations consisted of equal amounts of light and hybrid DNA.  – They proved that DNA replicates in a semiconservative manner. | 5m |
| OR | Lac Operon consists of the following :  – Structural genes : z, y, a which transcribe a polycistronic mRNA.  – gene ‘z’ codes for β-galactosidase  – gene ‘y’ codes for permease.  – gene ‘a’ codes for transacetylase.  – Promotor : The site where RNA polymerase binds for transcription.  – Operator : acts as a switch for the operon  – Repressor : It binds to the operator and prevents the RNA Polymerase from transcribing.  – Inducer : Lactose is the inducer that inactivates the repressor by binding to it.  – Allows an access for the RNA polymerase to the structural gene and transcription | 5m |
| Ans 33 | 1. a genetic structure in a cell that can replicate independently of the chromosomes, typically a small circular DNA strand in the cytoplasm of a bacterium or protozoan 2. A specific DNA sequence called the ‘*ori* site’ or ‘origin of replication’ in a chromosome is responsible for the initiation of replication.   A foreign DNA linked with the origin of replication can replicate and multiply itself in the host organism.   1. Due to the presence of the selective marker, the plasmid becomes useful for the cell. Under the selective conditions, only cells that contain plasmids with the appropriate selectable marker can survive. 2. DNA replication is the process of making two daughter strand where each daughter strand contains half of the original DNA double helix. Transcription is the process of synthesis of RNA using DNA as a template.  Insertional inactivation technique of recombinant DNA technology used to select bacteria that carry recombinant plasmids; a fragment of foreign DNA is inserted into a restriction site within a gene for antibiotic resistance, thus causing that gene to become nonfunctional. | 1x5 |
|  | OR |  |
|  | With the help of diagrammatic representation only, show the steps of recombinant  DNA technology. - Sarthaks eConnect | Largest Online Education Community | 3+2 |
|  | Restriction endonuclease-cuts the DNA fragments into sticky ends  Ligases- used to join the cut ends |  |
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