High Yield Hints GENETICS AND APPLICATION BIOLOGY

1. In a material medium, when a positron meets an electron, both the particles annihilate leading to the emission of two gamma ray photons. This process forms the basis of an important diagnostic procedure called – ***PET.***
2. In Drosophila melanogaster, normal body colour is brown and hereditary variant has yellow colour. When normal larva raised on food containing silver salts, they develop in to mutant but would give rise to brown flies in the normal environment, this effect of environment on expression of genes is – ***Phenocopies.***
3. **Haemolytic jaundice** is caused by a dominant gene but only 10% of the people actually develop it. What proportion of the children would be expected to develop the disease if a heterozygous man marries a homozygous woman – ***1 : 20***
4. The important features of **Positron Emission Tomography – PET** – are
    1. ***It uses radio isotopes such as Carbon 11 and Oxygen 15 tagged with glucose.***
    2. ***The principle of mass annihilation is used for emitting a pair of Gamma radiations.***
    3. ***Epilepsy, Schizophrenia, Parkinson's disease and Drug addiction can be studied.***

5. **Phenylketonuria** in man is caused by a **recessive allele p**. If both parents are carriers – **Pp** – what is the chance of all children are normal in population of five children – ***243 / 1024.***
6. In Tomato, genotype **aa bb cc** produces **100 gm** tomatoes and **AA BB CC** produces **136** tomatoes. What will be the weight of tomatoes in the parents and progenies of the cross between **Aa bb cc** and **aa BB cc** - ***106 g, 112 g , 112 g, 106g.***
7. In human an abnormality of the large intestine called **Intestinal Polyposis** is dependent on a **dominant gene A** and nervous disorder **Huntington's chorea** is determined by a **dominant gene H**. A man carrying the **gene A (Aahh**) married a woman carrying the **gene H (aa Hh).** Assume the A and H are on the non homologous chromosomes. What is the proportion of children that might be expected to have both abnormalities ***- 1 / 4***
8. **MRI** has the following features.
    1. ***It uses magnetic field of fixed frequency but varying magnetic field.***
    2. ***Defective cells absorb energy at a different frequency campared to healthy cells.***
    3. ***The magnetic field used is around 2 Telsa.***
9. The presence of recessive part of in a large population is found to be 16 %. The frequency of dominant allele in the population is – ***0.84***
10. Digital Substraction Angiography or DSA uses – ***Iodine angiographs***.
11. Simple radiography images – ***entail the difficulty of internal structure superimposition***.
12. Sonography uses – ***the principle of reflection of ultrasonic waves due to difference in densities of two tissues or organs.***
13. If only one chiasma is organized between two gene loci X and Y in 40 % of the tetrad of an individual of genotype AB / ab. The percentage of gametes in recombinants (Ab or Ab) considering linkage factor is ***- 5 %.***
14. The patient suffering from Killer Disease (SCID) can be cured by inserting ***- ADA gene***
15. E. Coli is used in genetic engineering to produce – ***Humulin, Interferon, Interleukin, Human GH.***
16. The microbe that remove oil spills is – ***Pseudomonas putida.***

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17. The longest human gene which is made up of 2400 Kilo base pairs is – **Gene for Duchenne muscular dystrophy.**

18. Chromatin is formed by a repeating series of chromosomes containing – ***DNA and Histones***.

19. The correct sequence of genes within the operon is – ***Regulator – Promoter – Operator – Structural genes.***

20. Wobble pairing takes place **– in some cases between the third base of codon and that of an anticodon.**

21. The concept of Split genes is that of – ***coding sequences in many eukaryotic genes are often separated by non coding sequences.***

22. Heterochromatinisation takesplace during – ***early gestational development***.

23. Gynandromorphism in certain flies is the result of – ***mis division of chromosomes where by one X chromosome gets lost.***

24. During mutagenesis the information necessary to repair the damage of segment of the DNA is present in – ***Proof reading enzyme DNA Polymerase I***

25. Magnetic Resonance Images are derived from the proton bearing species present principally from water and – ***long alkaline chain protons of the fatty acid moieties.***

26. The segment of DNA molecule determining the amino acid sequence of protein is – ***Structural gene.***

27. The Aminoacyl synthetase facilitates – ***adoption of amino acid by t RNA of its type.***

28. Largest chromosome is - ***Polytene chromosome***.

29. The Puffs in the Polytene chromosomes of the Salivary gland cells of Drosophila represents – ***Region of active protein synthesis***.

30. Chromosome puffs are also called as – ***Balbiani rings.***

31. Lampbrush chromosomes are found in – ***Amphibian Oocytes.***

32. Certain genetic elements that regularly " jump " to new locations, often inactivating the genes into which they become inserted. These are – *Transposones.*

33. Based on the current knowledge, which represents the complete and accurate depiction of " Central Dogma " in molecular biology – ***DNA*** $\rightleftarrows$ ***RNA*** $\longrightarrow$ ***Protein***.

34. The partial duplicates of structural genes which have incorporated sufficient changes so that they are not biologically active and usually are not transcribed are – *Pseudogenes.*

35. Point mutations are due to – ***changes in nucleotide sequences of a gene***.

36. Kappa particles are – *Sub microscopic granules formed by the folding of naked DNA found in the cytoplasm of Paramecium.*

37. Paramecium that kills other strains by producing toxin " Paramecin " contains – ***Kappa particles.***

38. The first step in the biosynthesis of polypeptide is catalysed by – *Aminoacyl –E-RNA synthetase.*

39. The Mitochondrial DNA or mt DNA is characterized by – ***the production of its own r-RNA and t-RNA which directly interact with mt DNA codon .***

40. Bar eye, a dominant character of Drosophila is due to – ***duplication of a chromosomal segment.***

41. The method used to detect chromosomal disorder during eight to tenth months of pregnancy is – ***Chorionic Villus Sampling or CVS.***

42. Test tube baby is produced by – ***fertilization outside and gestation inside the womb of mother.***

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43. First test tube baby is – ***Lousi Jay Brown.***

44. GIFT is – ***Embryo Implantation after in vitro Fertilization***.

45. Lack of sleep, loss of appetite, hallucinations are the symptoms due to the intake of – ***Cocaine.***

46. Replacement level in developed and developing countries is – ***2.1 and 2.7***

47. The average number of children that would be born to a woman during life time, assuming the age specific birth rate of a given year is – ***total fertility rate.***

48. Dilation of pupil, urination, high blood sugar level are the symptoms due to the intake of – ***Marijuana.***

49. The number of centers of origin of crop plants recognized by Vavilov is – ***7***

50. The characters of Plant introduction are
    1. ***give us new crops***
    2. ***give us new varieties***
    3. ***there is risk of disease.***
    4. ***quarantine is a must.***

51. Coccidiosis in poultry is caused by – ***Protozoan parasite Eimeria*** .

52. Multiple ovulation and embryo transfer (MOET) is the method of – ***hybridization in cattle.***

53. Viral disease of Silkworm is – ***Flacheria.***

54. The proteins present in silk are – ***Sericin and Fibroin.***

55. A loose association formed by nitrogen fixing bacteria with roots of crops is – ***Azospirillum.***

56. Anti-feedant property occurs in – ***Azadirachtin.***

57. Rotenone is – *Natural insecticide.*

58. Transgene expression can achieve by
    1. ***prevention of expression of native gene.***
    2. ***modify the existing bio chemical pathway.***
    3. ***produce a protein that itself produces phenotype of interest***.

59. The risks associated with GM crops are
    1. ***toxicity.***
    2. ***allergic RKn***
    3. ***antibiotic resistance in microorganisms present in the alimentary canal.***

60. EnzymeTissue Plasminogen Activator (TPA) is used for – ***dissolving blood clot.***

61. Cidar is prepared by – ***action of saccharomyces on apple juice***.

62. The bacterium associated symbiotically with non legume plant is – ***Frankia.***

63. " Collego " and " Devine " are two substances used as – ***Bioherbicides.***

64. Distemper is a fatal disease of dogs. The important feature of the disease is – ***humans have innate immunity for this disease.***

65. The only antibody that crosses placenta is – ***Ig G.***

66. piezoelectric effect is used in – ***CT scanning and Ultrasound imaging***.

67. PET is the best method for functional imaging because – ***Isotopes of basic body elements are used for imaging.***

68. Embryo culture is used for – ***recovery of inter specific hybrids***.

69. The crystal Lead Zirconate is a key component of – ***Sonography.***

70. The part of Endoscope that receives signals is – ***Transducer.***

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