



| SNo | Question | Option1 | Option2 | Option3 | Option4 | Correct Option |
|-----|---|---|---|---|--|----------------|
| 1 | Iron-55 (^{55}Fe) decays by electron capture. Which of the following GM counter can be used to detect ^{55}Fe ? | Type R, Sensitive energy range- 45KeV-1.5MeV | Type G, Sensitive energy range- 55Kev-5MeV | Type D, Sensitive energy range- 30KeV-15MeV | Type X, Sensitive energy range- 5KeV-10KeV | 4 |
| 2 | Iron-55 decays into which elemental substance and by emitting which type of radiation? | Manganese-55, X-Ray | Manganese-55, β -Ray | Manganese-55, α -Ray | Boron-33, X-Ray | 1 |
| 3 | Select the correct descending order in terms of ability to penetrate human skin by Alpha, Beta and Gamma particles. | Alpha>Beta>Gamma | Beta>Alpha>Gamma | Gamma>Alpha>Beta | Gamma>Beta>Alpha | 4 |
| 4 | Phosphorous-32 decays by which type of emission? | Alpha emission | Beta emission | Delta emission | Gamma emission | 2 |
| 5 | $^{32}_{15}\text{P}$ decays into ^{32}S with an emission of e^- . Calculate the number of protons on ^{32}S ? | 15 | 16 | 14 | 17 | 2 |
| 6 | Which is the most suitable shielding material for working with Phosphorus-32 isotope? | Concrete | Acrylic | Lead | Iron | 2 |
| 7 | Uranium-238 decays by Alpha decay emitting an alpha particle to thorium. $^{238}_{92}\text{U} \rightarrow \text{Th} + \text{Alpha particle}$. Select the correct thorium isotope from the above decay. | $^{234}_{90}\text{Th}$ | b. $^{230}_{90}\text{Th}$ | c. $^{236}_{92}\text{Th}$ | d. $^{236}_{90}\text{Th}$ | 1 |
| 8 | Ethidium Bromide solid waste should be discarded into--- | Clearly marked EtBr Solid waste bins placed near Imaging stations | In Bio-hazard waste bins placed in the laboratory kitchen | In waste bins placed on the service floors | Any bins at campus | 1 |
| 9 | MSDS stands for-- | Microscopy and spectroscopy Devices stability | Material Safety and Duties Solution | Manufacturer Specification and details sheet | Material Safety data Sheet | 4 |
| 10 | Which of the following is NOT a sterilization method? | UV irradiation | Fumigation | Vaccination | Autoclave | 3 |
| 11 | You should pipette by mouth- | When you cant find a pipette bulb or pipette aid | Only when your PI or lab mates are not looking | Always, Its fast , efficient and safe | Never | 4 |
| 12 | Liquid Biological spill has occurred in your lab. The first action should be to. | Call lab support staff to clean it up | Takeoff your gloves and call emergency. | Cordon off the area to stop anyone from spreading the contamination | spray with tap water | 3 |
| 13 | The monitoring equipment used in radiation lab is: | GM counter | Scintillation counter | Semiconductor detector | RF meter | 1 |
| 14 | One Gray of radiation is equal to: | 1 rad | 10 rads | 100 rads | 10000 rads | 3 |
| 15 | Biological dosimetry reflects: | Biological effect correlated with radiation dose | Biological effect converted from Gray to rad | Radiation dose required for sensitizing biological system | None of the above | 1 |

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| 16 | First nuclear incident was reported from: | Hiroshima and Nagasaki | Chernobyl disaster in Ukrainian SSR | Fukushima Daichiichi Nuclear disaster in Japan | Bhopal in India | 1 |
| 17 | Who should wear radiation badge? | Those who operate medical x-ray equipment | Those who operate MRI machine | Those who ship radioactive materials | None of the above | 1 |
| 18 | Following is the regulatory authority of radiation in India: | BARC | AERB | DRDO | TIFR | 2 |
| 19 | Radio waves will have | higher frequency compared to Gamma Rays | higher frequency compared to X-ray | higher frequency compared to UV rays | None of the above | 4 |
| 20 | Half-life of Iodine 131 is: | 8 days | 80 days | 5730 days | 5730 years | 1 |
| 21 | Marie Curie and her family bagged _____ Nobel Prizes | 2 | 3 | 4 | 5 | 3 |
| 22 | Initial signs of radiation sickness is: | Fever and Mild Headache | Fever and body pain | Nausea and Vomiting | None of the above | 3 |
| 23 | How many pollen mother cells should undergo meiotic division to produce 32 pollen grains? | 64 | 32 | 16 | 8 | 4 |
| 24 | Which among the following pair of primers can be used to PCR amplify the DNA fragment : 5'-ATGCGTGTGCTGATGCTAGCTG—(300)--GCTAGATCGATCGATCGTTTTAGCGCG-3' 3'-TACGCACAGCGACTACGATCGAC---(300)--CGATCTAGCTAGCTAGCAAATCGCGC-5' | 5'-ATGCGTGTGCTGATGCTAGCTG-3' and 5'-CGATCTAGCTAGCTAGCAAATCGCGC-3' | 5'-ATGCGTGTGCTGATGCTAGCTG-3' and 5'-GCTAGATCGATCGATCGTTTTAGCGCG-3' | 5'-TACGCACAGCGACTACGATCGAC-3' and 5'-GCGCGATTTGCTAGCTAGCTAGATCG-3' | 5'-ATGCGTGTGCTGCTGATGCTAGCTG-3' and 5'-GCGCGATTTGCTAGCTAGCTAGATCG-3' | 4 |
| 25 | What will happen to the rate of photosynthesis if sodium bicarbonate is added in the water having hydrilla plant in a beaker? | It will remain normal | It will be decreased | It will be stopped | It will be accelerated | 4 |
| 26 | If an endosperm cell of a flowering plant contains 24 chromosomes, the number of chromosomes in each cell of the root will be | 8 | 4 | 16 | 24 | 3 |
| 27 | The aminoacid without chiral carbon is _____ | Glycine | alanine | proline | tyrosine | 1 |
| 28 | If the endosperm cells of an angiosperm seeds are pentaploid, then such a seed may have been formed by which of the following parents? | Triploid female and diploid male. | Diploid male and tetraploid female. | Both parents tetraploid. | Triploid male and diploid female. | 2 |
| 29 | In eukaryotes, access to certain promoter sites on DNA by RNA polymerase is restricted by histones. For which of the following processes does this have the most direct consequence? | recognition of termination sites | control of gene expression | translocation of the tRNA along the ribosome | formation of the mitotic spindle | 2 |

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| 30 | Biologist Lynn Margulis is a proponent of the theory of endosymbiosis, which suggests that the mitochondria of modern eukaryotic cells evolved from bacteria living symbiotically within early eukaryotic cells, Which of the following is supporting evidence for this theory? | Mitochondria require the internal environment of the eukaryotic cell to replicate. | Mitochondrial rRNA is more similar to bacterial rRNA than to eukaryotic rRNA transcribed from nuclear DNA. | Mitochondria are morphologically indistinguishable from free-living bacteria. | Mitochondria that are removed from eukaryotic cells and placed in a growth medium can generate fully functioning free-living cells. | 2 |
| 31 | For the process of photosynthesis all except one of the following items are essential. Point out the exception | CO ₂ , optimum temperature | Glucose and oxygen | Water and minerals | Light and chlorophyll | 2 |
| 32 | If the strand of DNA has 35 nucleotide how many phosphodiester bonds would exist | 34 | 35 | 105 | 70 | 1 |
| 33 | A gas cylinder can be identified by | Color | size | weight | its smell | 1 |
| 34 | You are transporting a culture or sample from the lab to another area on campus. You should- | Collect everything in your arms with gloves on and than go | Put everything you need in a tub (Including gloves) and then go | Grab the neck of the flask and walkaway | Do nothing, There is no hazard | 2 |
| 35 | There is a very successful experiment done in the laboratory and you want to celebrate. Cake and ice cream are brought in, you should? | Light the candles in the lab and then celebrate | No biggie, don't do anything | Go to the canteen and celebrate | Cut the cake on the bench where the experiment was done. | 3 |
| 36 | Washing your hands is..... | Not to be done before you leave the laboratory | The single most important way to decrease contamination in the lab and outside of it. | For people with obsessive compulsive disorder | Not for you | 2 |
| 37 | This symbol means:  | Radioactive substance | Corrosive | explosive | Oxidizing | 3 |
| 38 | Biosafety level lab (BSL) suitable for high risk pathogens are: | BSL4 and 5 | BSL3 and 4 | BSL2 and 3 | BSL1 and 2 | 2 |
| 39 | What is the volume of a cylindrical canister with radius 7 cm and height 12 cm. | 1943.5 cm ³ | 1847.5 cm ³ | 1543. 5 cm ³ | 1747.5 cm ³ | 2 |
| 40 | What is the meaning of this symbol?  | Explosive | Fire Hazard | Oxidizing | Reducing | 3 |
| 41 | Following equation is related to corrosion rate | Nernst equation | Faraday's equation | Zambryski's equation | none of the above | 2 |
| 42 | The acronym HEPA (as in HEPA Filter) stands for: | High-Efficiency Particulate Air | High-Energy Particles in Air | High-Evaluation Protection | Hepatitis A | 1 |

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| 43 | Naturally acquired active immunity would be most likely acquired through which of the following processes? | Vaccination | Drinking Colostrum | Natural Birth | Infection with disease-causing organism followed by recovery | 4 |
| 44 | Monoclonal antibodies recognize a single. | Epitope | Bacterium | Antigen | B Cell | 1 |
| 45 | The cell containing many nuclei are called. | Coenocyte | Hyphae | Mycelium | Sporophore | 1 |
| 46 | Ozone depletion can be prevented by ... | decrease the usage of CFC products | fossil fuels are used in factories | use of scrubbers | none of these | 1 |
| 47 | Which of the following is an example of green biotechnology? | Industrial antibiotics | BT corn and pesticides | Industrial catalysts | Industrial chemicals | 2 |
| 48 | A darkly stained body within a nucleus without any prominent membranous boundary is called _____. Select the correct option. | Mitochondria | Nucleolus | Vacuole | Ribosome | 2 |
| 49 | Process of engulfing solid particles in the form of vacuoles. Select the correct option. | phagocytosis | pinocytosis | endocytosis | exocytosis | 1 |
| 50 | Why should near misses be reported? | To educate employees | To test the first aider | To ensure complete recovery | To stop a more serious event occurring | 4 |