NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 12 (maths) DPP (Academy) 19/08/2024

1. $\int \frac{dx}{\sin x.\sin(x+\alpha)}$ *is* equal to
2. $\int \frac{a^{\sqrt{x}}}{\sqrt{x}}$ dx is equal to
3. $\int \frac{\sqrt{\tan x}}{\sin x \cos x}\ dx\ is\ equal\ to$
4. If y = $\int \frac{dx}{(1+x^2)^{3/2}}\ and\ y = 0\ when\ x = 0\ then\ value\ of\ y\ when\ x = 1\ is$
5. $\int (x-1)e^{-x}$ dx is equal to
6. $\int \frac{1}{x^2(x^4+1)^{3/4}}$ dx is equal to
7. $\int [f(X)g''(X) - f''(X)g(x)]\ dx\ is\ equal\ to$
8. $\int (sin2x - cos\ 2x)dx = \frac{1}{\sqrt{2}}\ sin\ (2x-a) + b, then$
9. $\int \frac{1}{x(x^n+1)dx\ is\ equal\ to}$
10. $\int \sqrt{\frac{e^x-1}{e^x+1}}$ dx is equal to
11. $\int \sqrt{secx - 1}\ dx\ is\ equal\ to$
12. If $\int \frac{4e^x+6e^{-x}}{9e^x-4e^{-x}}$ dx = Ax +Bln($9e^{2x} - 4$)+ c, then
13. $\int e^{tan\theta}(x + \sqrt{x})\ dx\ is\ equal\ to$
14. $\int \frac{1-x^7}{x(1+x^7)}$ dx is equal to
15. $\int \frac{1}{[(x-1)^3(x+2)^5]^{1/4}}\ dx\ is\ equal\ to$
16. $\int \sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}$ dx is equal to
17. $Primitive\ of\ \frac{3x^4-1}{(x^4+x+1)^2}$
18. $\int \frac{a^{\sqrt{x}}}{\sqrt{x}}$ dx is equal to
19. $\int \sqrt{\frac{x-1}{x+1}}.\frac{1}{x^2}$ dx is equal to
20. $\int \sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}$ dx is equal to

NEW STANDARD ACADEMY

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CLASS 12 (BIOLOGY) DPP (Academy) 19/08/2024

1. What makes up the transfer of energy from one trophic level to another?
2. Who had proposed 10% law of energy?
3. What are detrivores ?
4. Name any two organisms which can occupy more than one trophic level in all ecosystems
5. What is common in earthworm, mushroom soil mites and dung beetle in an ecosystem?
6. Write a difference between net primary productivity and gross productivity.
7. Write the equation that helps in deriving the net primary productivity of an ecosystem.
8. What is detritus food chain made of? How do they meet their energy and nutritional requirements?
9. Differentiate between primary and secondary productivity.
10. How do you distinguish between humification and mineralization?
11. The numbers of trophic levels in an ecosystem are limited. Comment.
12. What are the shortcomings of ecological pyramids in the study of ecosystem?
13. Construct a pyramid of biomass starting with phytoplankton's. Label three trophic levels. Is the pyramid upright or inverted? Why.
14. Why the pyramid of energy is always upright? Explain.
15. Describe the interrelationship between productivity, gross primary productivity and net productivity.
16. What is the role of different types of bacteria in nitrogen cycle?
17. (a) What is an ecological pyramid? Compare the pyramids of energy, biomass and numbers.
18. The rate of decomposition of detritus is affected by the abiotic factors like the availability of oxygen, pH of the soil substratum, temperature, etc. Discuss.
19. In a plasmid cloning vector pBR322, BR refers to.
20. The vectors which move from one host to another and used in rDNA technology are?

NEW STANDARD ACADEMY

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CLASS 12 (PHYSICS) DPP (Academy) 19/08/2024

1. Calculate the energy required to excite an electron from first orbit of the hydrogen atom to the third orbit?
2. The total energy of an electron in the first excited state of the hydrogen atom is about -3.4eV. What is the potential energy of the electron in this state?
3. The total energy of an electron in the first excited state of the hydrogen atom is about -3.4 eV. What is the kinetic energy of the electron in this state?
4. Explain, why the spectrum of hydrogen atom has many lines, although a hydrogen atom contains only one electron.
5. Calculate the radius of the smallest orbit of H-atom.
6. Construct a quantity with the dimensions of length from the fundamental constants e, m_{epsilon} and h, where these letters have their usual meanings.
7. With the help of one example, explain how the neutron to proton ratio changes during alpha decay of a nucleus.
8. Explain with an example, whether the neutron to proton ratio in a nucleus increases or decreases due to beta decay.
9. Uranium 92 U ^ 238 is not suitable for chain reaction. Why?
10. What is critical size and critical mass as regards to nuclear fission?
11. What are thermal neutrons?
12. Why is the neutron so effective as a bombarding particle?
13. What is heavy water?
14. Explain the role played by the moderator in a nuclear reactor.
15. Why are control rods made of cadmium in a nuclear reactor?
16. The ground state energy of hydrogen atom is -13.6 eV. What are the kinetic and potential energies of the electron in this state?
17. A hydrogen atom initially in the ground level absorbs a photon, which excites it to the n = 4 level. Determine the wavelength and frequency of photon.
18. (a) Using the Bohr's model, calculate the speed of the electron in a hydrogen atom in the n = 1 2 and 3 levels.
    (b) Calculate the orbital periods in each of these levels.
19. The radius of the innermost electron orbit of a hydrogen atom is 5.3×10^{-11} m. What are the radii of the and n = 2 n = 3 orbits?
20. A 12.75 eV electron beam is used to bombard gaseous hydrogen at room temperature. What series of wavelengths will be emitted?