

Name \_\_\_\_\_

Circle best answer.

1. Free radicals are \_\_\_\_\_.  
(A) molecules that have lost an electron (C) molecules with extra neutrons  
(B) escaped political prisoners (D) produced by vitamins
2. The chromosomal location of the APC gene was originally identified by finding a region of the genome that was \_\_\_\_\_ in patients with colorectal cancer.  
(A) deleted (B) rearranged (C) normal (D) unclear
3. The National Health Service of the United Kingdom (Britain) has recommended e-cigarette use to quit smoking.  
(A) True (B) False
4. Over the years, several large studies have failed to find any health benefit from taking vitamins or supplements. What can you conclude from these results?  
(A) Vitamins and supplements have no effect on health.  
(B) There is no experimental evidence for a health benefit from vitamins and supplements.  
(C) Vitamins and supplements work, experimental science does not.  
(D) None of the above.
5. Increased rates of vaping in middle school students in the US will lead to increased rates of traditional cigarette smoking.  
(A) True (B) Unclear (C) False
6. Which of the following are treatment options for both Prostate and Breast cancer.  
(A) hormone therapy (C) radiation  
(B) surgical organ removal (D) B and C  
(E) A, B and C
7. Herd immunity to HPV infection is demonstrated by which of the following?  
(A) decrease in oncogenic HPV subtypes in those vaccinated.  
(B) decrease in all HPV subtypes in the unvaccinated  
(C) decrease in oncogenic HPV subtypes in the unvaccinated.  
(D) no correct answer  
(E) A and C
8. Which of the following contributes to uncertainty regarding e-cigarette use.  
(A) e-liquid quality (C) nicotine concentration  
(B) flavoring component safety (D) A, B and C
9. Access to health care can lead to which of the following.  
(A) earlier detection (C) later stage cancer diagnosis  
(B) better screening (D) A, B and C
10. Experts disagree at what age and how often a women should have a mammogram. This is due to evidence that better screening has led to \_\_\_\_\_ which has resulted in \_\_\_\_\_.  
(A) more tumors detected, more deaths (C) more tumors detected, overtreatment  
(B) false negatives, fewer treatments (D) fewer tumors detected, better treatment

11. Herd immunity refers to the protection for all from vaccination of the majority of the population. Which one of the following would **NOT** lead to increased protection from cervical cancer by HPV infection?
- (A) improved vaccines (C) Gardasil for boys  
(B) increasing Gardasil immunization rates (D) HPV antibody testing the sexually active
12. Obesity can lead to insulin resistance. High levels of insulin can act as growth factor for various tumor types. These data highlight the link between \_\_\_\_\_ and \_\_\_\_\_.
- (A) glucose, diabetes (C) diet, cancer  
(B) diet, lung cancer (D) diabetes, colon cancer
13. A randomized double blind study is considered the best way to judge if a treatment is effective. In this type of trial both doctor and patient are 'blind' to control for \_\_\_\_\_ in the patient and \_\_\_\_\_ in the doctor.
- (A) placebo effect, bias (C) bias, placebo effect  
(B) bias, malpractice (D) symptoms, bias
14. Obesity in postmenopausal women increases the risk of breast cancer. This is due to the increased production of \_\_\_\_\_ in adipose/fat cells that acts as a fuel for \_\_\_\_\_.
- (A) estrogen, estrogen receptor positive tumors (C) testosterone, aromatase  
(B) estrogen, all breast cancers (D) PSA, aromatase
15. Population studies consistently show that caloric restriction reduces overall cancer risk. These data confirm the link between \_\_\_\_\_ and \_\_\_\_\_.
- (A) diabetes, cancer (C) vitamin supplements, cancer  
(B) excess calories, increased cancer risk (D) dieting, heart disease
16. For whom would Prostate Cancer screening (including PSA testing) be the most important.
- (A) white males > 70 years old (B) black males > 70 years old  
(C) black males 40 years old (D) none of A, B or C
17. Some recent studies suggest that the obesity epidemic in America is not caused by eating too much junk food. If this is the case, which of the following could be causing the increase in obesity?
- (A) physical inactivity (C) processed foods  
(B) fatty foods (D) A,B and C
18. Benzopyrene diol-epoxide is a component of \_\_\_\_\_ and has been shown to directly cause mutations in the \_\_\_\_\_.
- (A) benzene, K-ras oncogene (C) tobacco smoke, p53 gene  
(B) e cigarettes, K-ras proto oncogene (D) chewing tobacco, p53 gene
19. In the US the majority of ortho-pharyngeal (throat) cancers happen in men over 70.
- (A) True (B) Unknown (C) False
20. Risk of Triple Negative Breast Cancer has been shown to be reduced in African American women who?
- (A) take birth control for longer than 3 years (C) have breast fed for more than 6 months  
(B) that did not have kids (D) had a bilateral mastectomy

21. Which of the following states the **MOST** accurate/complete information on vaping,  
(A) vaping is completely safe (C) vaping is more dangerous than tobacco  
(B) vaping has been recommended for quitting cigarettes (D) vaping safety has yet to be proven
22. Studies sponsored by the soda industry have established a link between increased sugar consumption and obesity and diabetes.  
(A) True (B) Unknown (C) False
23. Cervical cancer rates in the developing world far exceed those of the USA and Western Europe. This is **most** likely due to \_\_\_\_\_.  
(A) diet (C) availability of PAP smear test  
(B) chemical exposure (D) both B and C
24. PSA screening is a good predictor of metastatic prostate cancer spread.  
(A) True (B) Unclear (C) False
25. The risk associated with BRCA mutations has changed over time.  
(A) True (B) False
26. In a clinical trial for a new drug for chronic pain, a patient who received the placebo got worse. This is **most** likely due to \_\_\_\_\_.  
(A) the placebo effect (C) book keeping error  
(B) the nocebo effect (D) fraud
27. An estimated 80% of the sexually active world population has been exposed to HPV. Why is it that exposure to HPV does not lead to cervical cancer every time?  
(A) HPV can't spread in humans (C) virus must infect basal stem cell layer  
(B) progression to cancer requires co factors (D) the virus cannot be cleared
28. Triple negative breast cancer rates in African American women are due to access to care.  
(A) True (B) Unclear (C) False
29. Aromatase Inhibitors are used to treat ER+ breast cancer in post-menopausal women.  
(A) True (B) False
30. Since the introduction of e-cigarettes, calls to CDC Poison Control hotline for accidental e-liquid poisoning have gone up.  
(A) True (B) Unknown (C) False
31. Nicotine is an addictive substance due, in part, to its ability to bind \_\_\_\_\_ found on \_\_\_\_\_.  
(A) VEGF receptors, endothelial cells (C) Wnt receptors, tumor cells  
(B) neurotransmitter receptors, brain cells (D) acetylcholine receptors, lung cells
32. Expert groups disagree about the use of which of the following?  
(A) mammography (B) PSA testing  
(C) chemotherapy (D) A and B  
(E) all of the above

33. Recently, a large study showed that large, daily doses of aspirin protect against colon cancer. This type of study reinforces the link between \_\_\_\_\_ and \_\_\_\_\_.  
 (A) mutations, polyps (C) aspirin, stomach upset  
 (B) cancer, diet (D) cancer, chronic inflammation
34. Obesity is linked to a variety of cancers. The evidence for this link is mostly?  
 (A) Genetic (C) correlative from observational studies  
 (B) from mouse studies (D) All are correct
35. Antioxidants \_\_\_\_\_.  
 (A) have been shown in some studies to promote cancer cell growth  
 (B) have been proven to prevent cancer  
 (C) are found naturally in fruits and vegetables  
 (D) a, b and c  
 (E) a and c only
36. Curcumin is a potentially therapeutic \_\_\_\_\_ compound found in the spice turmeric.  
 (A) carcinogenic (C) synthetic  
 (B) chemopreventive (D) spicy
37. Nicotine is a human \_\_\_\_\_. In tobacco plants it acts as an \_\_\_\_\_.  
 (A) poison, enzyme (C) neurotransmitter, insecticide  
 (B) stimulant, energy source (D) poison, insecticide
38. In colon cancer cells with APC mutations, B catenin is not destroyed and growth factor signaling is stuck in the \_\_\_\_\_ position and tumors form. The APC gene is classified as a(n) \_\_\_\_\_.  
 (A) off, oncogene (C) off, tumor repressor  
 (B) on, tumor suppressor (D) on, DNA repair gene
39. Monamine Oxidase B (MAO B) is an enzyme involved in neurotransmitter metabolism. In smokers, MAO B levels are greatly reduced in the brain, lungs and other organs. Tobacco \_\_\_\_\_ inhibits MAO B leading to \_\_\_\_\_.  
 (A) smoke, lung cancer (C) nicotine, addiction  
 (B) smoke, enhanced nicotine effects (D) additives, emphysema
40. Increased colonoscopies has led to earlier detection of colon cancer. However, recent studies have shown that less expensive, lower tech options like \_\_\_\_\_ offer nearly the same screening benefit.  
 (A) flexible sigmoidoscopy (C) CT scans  
 (B) fecal occult stool testing (D) fecal DNA testing

**40 questions only**