This exam consists of 33 questions, each of equal value. For the multiple choice questions, choose the single most appropriate answer for entry onto the Pharmacology Exam #3 Answer Sheet.

1. R.G., a 56 year-old male, is receiving chemotherapy treatment with a combination of cyclophosphamide, vincristine and prednisone. A fourth drug, allopurinol, is now added to R.G.'s regimen. The most likely explanation for the addition of the allopurinol:

A. To inhibit the efflux of the therapeutic drugs from the cancerous cells  
B. To provide a source of tetrahydrofolate  
C. To stimulate red blood cell production  
D. To inhibit uric acid production  
E. To inhibit topoisomerase activity

2. The picture below is meant as a warning against eating foods containing tyramine while taking a certain anti-neoplastic agent (Drug Y). What is Drug Y?

A. Cisplatin  
B. Procarbazine  
C. Methotrexate  
D. Asparaginase  
E. Rituxanab
3. Indicate which of the following statements concerning diazepam are CORRECT:

A. It has approximately the same risk for producing respiratory depression as does phenobarbital
B. It increases the affinity of GABA for the GABA<sub>A</sub> receptor
C. Its pharmacological action is antagonized by flumazenil
D. A and B
E. B and C

4. S.W. is a 24 year-old male who is receiving haloperidol treatment for schizophrenia. Upon developing Parkinsonian-like motor side effects, he is treated with Drug X, which reduces the motor side effects. The most likely identity of Drug X:

A. Chlorpromazine
B. Physostigmine
C. Benztrpine
D. Diazepam
E. Naloxone

5. Isoniazid-induced sideroblastic anemia is best treated with:

A. Pyridoxine
B. Hydroxyurea
C. Deferoxamine
D. Vitamin B<sub>12</sub>
E. Leucovorin

6. Indicate which of the following statements concerning warfarin are CORRECT:

A. It activates antithrombin III
B. It is teratogenic
C. Full anticoagulant effect is achieved within 12 hours of drug administration
D. A and B
E. B and C

7. All of the following statements concerning high molecular weight heparin are correct EXCEPT:

A. It binds to thrombin
B. It is not teratogenic
C. It is not given via the oral route of administration
D. Its anticoagulant potency is increased by protamine sulfate
E. Bleeding is a major side effect of heparin treatment
8. The anticoagulant action of warfarin is decreased by concurrent administration of:

A. Vitamin K  
B. Vitamin B₆  
C. Vitamin C  
D. A and B  
E. B and C

9. A dopamine pathway in the brain associated with rewarding or reinforcing properties:

A. Substantia nigra to striatum  
B. Septum to hippocampus  
C. Ventral tegmentum to nucleus accumbens  
D. Striatum to substantia nigra  
E. Thalamus to cerebral cortex

10. A partial agonist at mu opiate receptors that has been used in the treatment of opiate addiction:

A. Lofexidine  
B. Buprenorphine  
C. Naltrexone  
D. A and B  
E. B and C

11. An anxiolytic agent that is a 5-HT₁A agonist:

A. Lorazepam  
B. Phenelzine  
C. Propranolol  
D. Buspirone  
E. Imipramine

12. W.Z., a 38-year-old female, is receiving drug therapy for depression. After eating a cheese fondue, she develops a sudden increase in blood pressure and a pounding headache. Which of the drugs below is the most likely anti-depressant therapy that she has been receiving?

A. Desipramine  
B. Fluoxetine  
C. Lithium  
D. Sertraline  
E. Phenelzine
13. The clinical potency of neuroleptics (antipsychotics) appears to most closely parallel their potency for blocking:

A. Serotonin 5-HT₂ receptors
B. Catecholamine α₂ receptors
C. Dopamine D₂ receptors
D. Cholinergic M₂ receptors
E. Serotonin 5-HT₁A receptors

#14-17. Match-up the numbered anti-neoplastic drugs below with the single most appropriate lettered description. Each lettered description may be used once, more than once, or not at all.

14. Methotrexate __D__

15. Imatinib (Gleevec) __A__

16. Flutamide __E__

17. Trastuzumab (Herceptin) __B__

A. An inhibitor of a tyrosine kinase enzyme
B. An inhibitor of a growth factor receptor
C. An estrogen receptor antagonist
D. An inhibitor of dihydrofolate reductase
E. An androgen receptor antagonist

18. An anti-neoplastic drug that works by inhibiting microtubule disassembly:

A. Vinblastine
B. Tamoxifen
C. Paclitaxel
D. Doxorubicin
E. Flutamide

19. Indicate which of the following statements concerning aspirin are CORRECT:

A. It stimulates the production of prostacyclin (PGI₂) in endothelial cells
B. It inhibits platelet aggregation
C. It inhibits the production of thromboxaneA₂ in platelets
D. A and B
E. B and C
20. Etoposide
   C

21. Doxorubicin
   D  on

22. Vincristine
   E

A. Cell-cycle non-specific, inhibitor of tyrosine kinase activity  
B. Cell cycle specific, inhibitor of microtubule assembly  
C. Cell-cycle specific, inhibitor of topoisomerase activity  
D. Cell-cycle non-specific, cardiotoxicity a possible side effect

23. It is important to distinguish anemia due to folate deficiency vs. anemia due to vitamin B₁₂ deficiency because:
   A. If you treat a B₁₂ deficiency with folic acid the patient can still develop neurological damage  
   B. If you treat a folate deficiency with B₁₂ the patient will lose their ability to absorb B₁₂ in the GI tract  
   C. If you treat a folate deficiency with B₁₂ the patient will develop methionine toxicity  
   D. A and B  
   E. B and C
24. Indicate which of the following statements concerning treatment for iron deficiency are CORRECT:

A. If 4 weeks of oral ferrous sulfate administration fails to correct the deficiency the patient should be checked for internal bleeding ✓
B. If 4 weeks of oral ferrous sulfate administration fails to correct the deficiency the patient should be checked for an iron absorption deficiency ✓
C. If a child in the family gets hold of the ferrous sulfate bottle and ingests a potentially toxic amount of iron, the child can be treated with cobalamin as an antidote ✗
D. A and B
E. A, B and C

25. Which of the following antipsychotic drugs are LEAST likely to produce tardive dyskinesia?

A. Chlorpromazine
B. Fluphenazine
C. Haloperidol
D. Haloperidol decanoate
E. Risperidone

26. Drug Z has an IC₅₀ for inhibiting serotonin uptake into serotonergic nerve terminals of 150 nM, and an IC₅₀ for inhibiting norepinephrine uptake into noradrenergic nerve terminals of 5000 nM. The drug most likely to be Drug Z:

A. Desipramine
B. Buspirone
C. Sertraline
D. Tranylcypromine ✗
E. Benztrapine ✓

#27-30. Match up the numbered drugs below with the single most appropriate lettered description. Each lettered description may be used once, more than once, or not at all.

27. Erythropoietin E
28. Alteplase D
29. Ticlopidine A
30. Tranexamic acid B

A. An inhibitor of platelet aggregation
B. An inhibitor of plasminogen activation
C. An activator of fetal hemoglobin production
D. An agent used to help destroy blood clots via fibrin lysis
E. An activator of red blood cell formation
31. The leucovorin rescue strategy is used in conjunction with anti-neoplastic therapy employing:

A. Paclitaxel  
B. Tamoxifen  
C. Methotrexate  
D. Procarbazine  
E. Asparaginase

32. CHOP is a combination anti-neoplastic drug regimen. Which drug is the C in CHOP?

A. Cisplatin  
B. Carmustine  
C. Cytarabine  
D. Cyclophosphamide  
E. None of the above

33. Drugs useful in countering nausea and emesis (vomiting) produced by anti-neoplastic agents:

A. Ondansetron  
B. Buprenorphine  
C. Flumazenil  
D. A and B  
E. B and C

END OF THE PHARMACOLOGY EXAM: TIME TO RELAX!