Pharmaceutical Organic Chemistry

1. The following statement is/are true regarding the relationship of bond length and bond polarity except:

   a. As the bond polarity increase, the bond length decreases
   b. A C-F bond has a longer bond length than C-C
   c. As bond polarity increases the bond length also increases
   d. A and B only
   e. B and C only

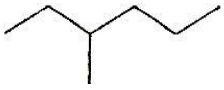
2. The following statement/s is/are true regarding the relationship of hybridization of orbitals and bond length:

   a. As the s character increases, the bond length increases
   b. As the s character increases, the bond length decreases
   c. The bond length of acetylene is longer than the bond length of ethylene
   d. The bond length of ethane is shorter than the bond length of ethylene
   e. None of the choices

3. Bond strength or bond energy is the energy necessary to break the only bond in a diatomic molecule or to dissociate the bonded atoms to their bond state. Which of the following statements is/are true regarding its relationship with orbital hybridization, bond length and bond poarity?

   a. When the s character of the bonding orbitals increases, the bond energy also increases
   b. When the polarity of the bond increases, the bond energy also increases
   c. Bond energy and bond length has inverse relationship.
   d. All of the choices
   e. A and B only

4. What is the name of the following structure?



   a. 4 methyl hexane
   b. Isohexane
   c. 3-methyl hexane
   d. 2-ethyl pentane
   e. 2-propyl butane

5. What is the name of the following structure?

48. Which of the following antibacterial agents acts by inhibiting the metabolism of microbial organism but not of the host?

a. Sulfonamides
b. Polymyxins
c. Penicillins
d. Rifamycin
e. Nalidixic acid

49. Which of the following antibacterial agents inhibit s bacterial cell wall synthesis?

a. Sulfonamides
b. Polymyxins
c. Penicillins
d. Rifamycin
e. Nalidixic acid

50. Which of the following antibacterial agent can interact with the plasma membrane of bacterial cells to affect membrane permeability?

a. Sulfonamides
b. Polymyxins
c. Penicillins
d. Rifamycin
e. Nalidixic acid

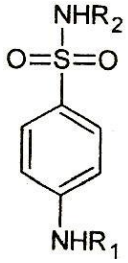
51. Which of the following antibacterial agents can disrupt the synthesis of essential proteins and enzyme required for the cell's survival?

a. Sulfonamides
b. Polymyxins
c. Penicillins
d. Rifamycin
e. Nalidixic acid

52. This antibacterial agent can inhibit the nucleic acid transcription and replication which prevents cell division and.or protein synthesis.

a. Sulfonamides
b. Polymyxins
c. Penicillins
d. Rifamycin
e. Nalidixic acid

53. For questions 53-55, refer to the general structure of sulphonamides below:



79. A bacteriostatic antibiotic which inhibits protein synthesis by binding to the 30s subunit of ribosomes and preventing aminoacyl tRNA from binding. This drug was isolated from *Streptomyces aureofasciens.*

a. Chlortetracycline
b. Streptomycin
c. Chloramphenicol
d. Lincomycin
e. Erythromycin

80. Which of the following antibiotics has a large lactone ring, a ketone group and a glycosidically linked amino sugar in its structure?

a. Chlortetracycline
b. Streptomycin
c. Chloramphenicol
d. Lincomycin
e. Erythromycin

81. Clindamycin, a sulphur containing antibiotic, must not be given with which of the following drugs because of having the same binding site at the ribosomes?

a. Chlortetracycline
b. Chloramphenicol
c. Erythromycin
d. A and B only
e. B and C only

82. Quinupristin and Dalfupristin are streptogramins isolated from

a. *Streptomyces griseus*
b. *Streptomyces pristinaespiralis*
c. *Acremonium chrysogenu*
d. *Streptomyces nodosus*
e. *Streptomyces erythreus*

83. Which of the following drug is an oxazolidinone that can prevent the formation of 70s ribosome by binding to the 50s subunit?

a. Quinupristin
b. Linezolid
c. Ofloxacin
d. Metronidazole
e. Proflavine

84. Nalidixic acid was the first therapeutically agent in the class of compounds that inhibits topoisomerase enzymes, resulting in inhibition of replication and transcription. Which of the following is related to nalidixic acid?

c. Carboplatin
d. Irinotecan
e. Cyclophosphamide

113. Which of the following drugs is not an alkylating agent used in cancer chemotherapy?

a. Carmustine
b. Busulfan
c. Procarbazine
d. Mitomycin C
e. None of the choices

114. A thiopurine prodrug which is converted to its corresponding monophosphate that inhibits purine synthesis.

a. Methotrexate
b. 5-fluorouracil
c. 6-mercaptopurine
d. Pentostatin
e. Cytarabine

115. An antimetabolite that is very similar in structure to the natural folates, differing only in additional amino and methyl groups. It inhibits the enzyme dihydrofolate reductase which is responsible in maintaining levels of the enzyme cofactor tetrahydrofolate.

a. Methotrexate
b. 5-fluorouracil
c. 6-mercaptopurine
d. Pentostatin
e. Cytarabine

116. This drug acts as a prodrug for a suicide inhibitor. It is converted in the body to the fluorinated analogue of 2'deoxyuridylic acid monophosphate which then combines with the enzyme thymidylate synthase and the cofactor.

a. Methotrexate
b. 5-fluorouracil
c. 6-mercaptopurine
d. Pentostatin
e. Cytarabine

117. An anti-leukemia drug isolated from *Streptomyces antibioticus* and is a powerful inhibitor of Adenosine deaminase.

a. Methotrexate
b. 5-fluorouracil
c. 6-mercaptopurine
d. Pentostatin
e. Cytarabine

118. A prodrug analogue of 2'deoxycytidine which inhibits DNA polymerases.

a. Methotrexate
b. 5-fluorouracil
c. 6-mercaptopurine
d. Pentostatin
e. Cytarabine

119. Which of the following pairs is correctly matched?

I. Glucocorticoids: Megestrol acetate
II. Progestins: prednisone
III. Estrogens: Diethylstilbestrol
IV. Androgens: Fluoxymesterone

a. I, II, III, IV
b. I, II
c. III, IV
d. I, III
e. II, IV

120. A decapeptide analogue of the luteinizing hormone – releasing hormone designed to be more resistant to peptidase degradation.

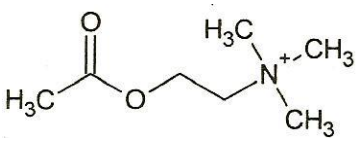
a. Goserelin
b. Raloxifene
c. Cyproterone acetate
d. Anastrazole
e. 4-hydroxyandrostenedione

121. A reversible competitive inhibitor of the enzyme aromatase , the design of which is based on structure of amino gluthetimide.

a. Goserelin
b. Raloxifene
c. Cyproterone acetate
d. Anastrazole
e. 4-hydroxyandrostenedione

122. This mode of therapy involves an antibody which has catalytic activity designed to activate a prodrug.

a. Antibody-directed enzyme prodrug therapy (ADEPT)
b. Antibody-directed abzyme prodrug therapy (ADAPT)
c. Gene -directed enzyme prodrug therapy (GDEPT)
d. Photodynamic therapy
e. All of the above



127. Which part of the acetylcholine structure can be altered without decreasing its activity on cholinergic receptors?

a. The quaternary nitrogen
b. The ester functional group
c. The ethylene bridge between the ester and nitrogen
d. All of the above
e. None of the choices

128. Which part of the acetylcholine structure is essential for activity?

a. The quaternary nitrogen
b. The ester functional group
c. The ethylene bridge between the ester and nitrogen
d. All of the above
e. None of the choices

129. Which of the following statements is incorrect regarding the structure-activity relationship of acetylcholine?

a. Replacing the nitrogen atom with a neutral carbon atom increases the activity
b. The overall size of the molecule cannot be altered greatly.
c. There must be two methyl groups on the nitrogen.
d. A and B
e. B and C

130. Which of the following statements is true regarding acetylcholine analogues?

a. Addition of steric shield in the ethylene bridge renders resistance to chemical and enzymatic hydrolysis
b. Changing the ester to a carbamate increases resistance to hydrolysis
c. Changing the ester to a carbamate makes it selective to muscarinic receptor
d. A and B
e. B and C

For nos. 131-132, refer to the structures below:

A. It is an inotropic agent

B. It relaxes the vascular smooth muscle (vasodilation)

C. It inhibits the calcium ion reflux into myocardial cells

D. It blocks the beta adrenergic receptor

E. None of the above

159. A drug used in the treatment in myocardial insufficiency that is structurally similar to adenosine, a natural vasodilatory substance released by the myocardium during hypoxic episodes.

A. Cyclandelate D. Diltiazem

B. Dypirydamole E. Nifedipine

C. Papaverine

160. An antiarrythmic drug composed of a quinoline ring and a bicyclic quinuclidine ring system connected by a hydroxymethylene bridge that is a member of a family of alkaloids found in cinchona bark.

A. Disopyridamole D. Tocainide

B. Flecainide E. Procainamide

C. Quinidine

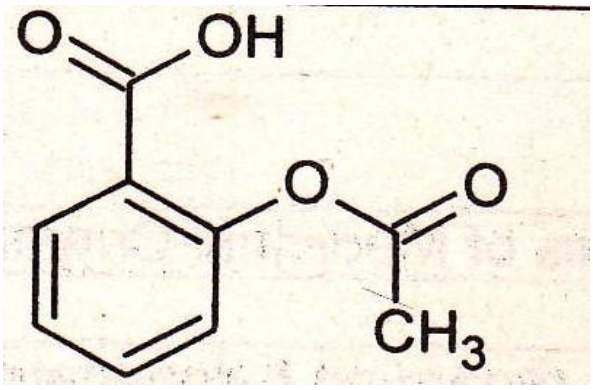
161. An antiarrythmic drug that is an α-methyl analog structurally related to monoethylglycinexylide, the active metabolite of xylocaine.

A. Disopyramide D. Tocainide

B. Flecainide E. Procainamide

C. quinidine

162. What is the use the mechanism of action of this antiplatelet drug with the following structure:



A. It blocks the platelet phosphodiesterase enzyme, therefore leading to higher cyclic adenosine monophosphate levels.

B. It reversibly inhibits the cyclooxygenase enzyme

C. Chloramphenicol palmitate

D. Chloramphenicol succinate

E. Hetacillin

228. These are isomer that contain at least one assymetric, or chiral, carbon atom. Each asymmetric carbon atom can exist in one of two non-superimposable isomeric forms.

A. Optical isomer

B. Geometric isomer

C. Conformational isomer

D. All of the above

E. None of the choices

229. This type of isomer occurs as a result of restricted rotation about a chemical bond, owing to double bond or rigid ring system in the molecule.

A. Optical isomer

B. Geometric isomer

C. Conformational isomer

D. All of the above

E. None of the choices

230. Also known as rotamers, these are non-superimposable orientation of a molecule which result from the rotation of atoms about single bonds.

A. Optical isomer

B. Geometric isomer

C. Conformational isomer

D. All of the above

E. None of the choices

231. Which of the following statements is true regarding ester-type local anesthetics?

A. They are generally long acting and are metabolized in the liver

B. They are generally short acting due to rapid hydrolysis in the plasma

C. Agents include procaine, benzocaine, lidocaine and dibucaine

D. A and B only

E. A and C only

232. Which of the following statements is true regarding amide-type local anesthetics?

A. They are generally long acting and are metabolized in the liver

B. They are generally short acting due to rapid hydrolysis in the plasma

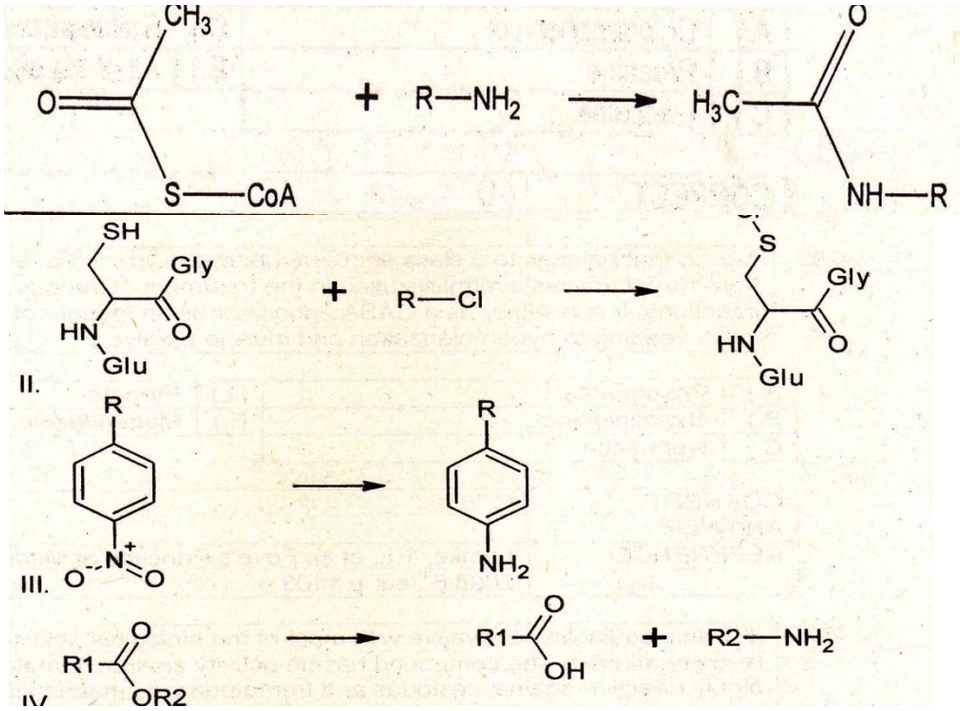
C. Agents include procaine, benzocaine, lidocaine and dibucaine

D. A and B only

E. A and C only

233. Which of the following statements is true regarding the antipsychotic agents in the phenothiazine class?

For nos. 267-268, refer to the following reaction pathway



A)I,II,III,IV

B)I,II only

C)III,IV only

D)I,III

E)II,IV

268.Which of the givem reactions can be classified as Phase II metabolism?

A)I,II,III,IV

B)I,II only

C)III,IV only

D)I,III

E)II,IV

269.Which of the following drugs would most likely undergo nitroreduction?

A)Chloramphenicol

B)Procaine

C)Lidocaine

D)Sulfasalazine

E)All of the above

270.Which of the following drugs would most likely undergo azoreduction

A)Chloramphenicol

B)Procaine

C)Lidocaine

D)Sulfasalazine

E)All of the above

271.Which of the following drugs would most likely undergo ester hydrolysis

A)Chloramphenicol

B)Procaine

C)Lidocaine

D)Sulfasalazine

E)All of the above

272.Which of the following drugs would likely undergo amide hydrolysis

A)Chloramphenicol

B)Procaine

C)Lidocaine

D)Sulfasalazine

E)All of the above

273.This conjugation pathway is extremely important in preveting toxicity from a variety of electrophilic agents.It produces a mercaptopuric acid derivative upon reaction with an electrophile

A)Glutathione conjugation

B)Acetylation

C)Methylation

D)Sulfate conjugation

E)Amino acid conjugation

274.S-adenosylmethionine is required for the conjugation reaction

A)Glutathione conjugation

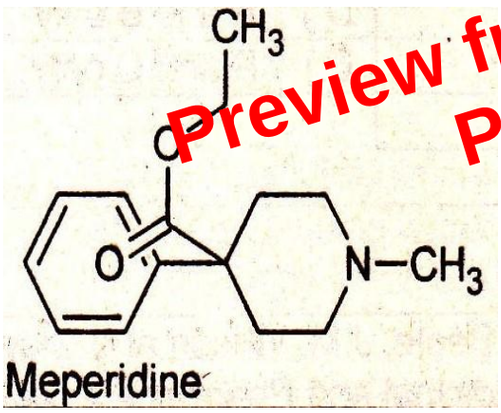
B)Acetylation

C)Methylation

D)Sulfate conjugation

E)Amino acid conjugation

275. Meperidine can undergo which of the following metabolic pathway?



Meperidine

I. Hydroxylation at thr aromatic ring

II. Ester hydrolysis

III. N-oxidation

IV. N-dealkylation

A. I,II,III,IV

B. I,II,III

C. I,II

D. I,III

E. II,IV

B. Normorphine

C. Diphenoxylate

D. Nalbuphine

E. Diacetylmorphine Hydrochloride

290. This drug has a strong structural relationship to the meperidine type analgesics and has the ability to inhibit excessive gastrointestinal motility.

A. Tramadol hydrochloride

B. Normorphine

C. Diphenoxylate

D. Nalbuphine

E. Diacetylmorphine Hydrochloride

291. Which of the following modifications can affect the onset , degree and duration of insulin activity?

A. Rearrangement of amino acid residues at the N- and C- terminus at the B chain of insulin

B. Changing the insulin crystal type (ex. From crystalline to amorphous)

C. Addition of modifying protein such as protamine

D. Changing the site of injection

E. All of the above

292. This is the only insulin analogue with a C14 fatty acid attached to an amino residue in the B chain of insulin

A. Lispro

B. Aspart

C. Glulisine

D. Glargine

E. Detemir

293. A highly purified protein containing 165 amino acids manufactured from a strain of E. coli bearing a genetically engineered plasmid containing an interferon alfa 2a gene from leukocytes. This drug is used in patients 18 years or older for treatment of hairy cell leukemia and chronic myelogenous leukemia.

A. Roferon-A

B. Interon

C. Aldesleukin

D. Rituximab

E. Gemtuzumab Ozogamicin

294. A highly purified protein produced by E.coli containing a plasmid with alfa 2b gene. This product is indicated for hairy cell leukemia and also useful in treating malignant melanoma.

A. Roferon-A

B. Interon

C. Aldesleukin

D. Rituximab

E. Gemtuzumab Ozogamicin

295. It is also known as interleukin 2 or T-cell growth factor. This product when administered stimulates T-cell growth and regulation, proliferation and immunoglobulin production in B lymphocytes macrophage activity enhancement

A. Roferon-A