

Exam Date & Time: 23-Jul-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

B.Pharm Semester II
End semester examination

Pharmaceutical Organic Chemistry-I [PCH-BP202T]

Marks: 75

Duration: 180 mins.

I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

Answer all questions

- 1) Which compound produces only one alkene when treated with sodium methoxide? (1)
- | | | | |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|
| 1) 2-chloro-2-methylpentane | 2) 3-chloro-3-ethylpentane | 3) 3-chloro-2-methylpentane | 4) 2-chloro-4-methylpentane |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|
- 2) When 3-iodo-3-ethylpentane is treated with sodium methoxide in methanol, the major organic product is an _____ that is generated through an _____ mechanism. (1)
- | | | | |
|---------------|---------------|---------------|---------------|
| 1) ether, SN1 | 2) ether, SN2 | 3) alkene, E1 | 4) alkene, E2 |
|---------------|---------------|---------------|---------------|
- 3) Which of the following statements applies to the E2 mechanism? (1)
- | | | | |
|---|--|--|---|
| 1) It occurs with inversion of stereochemistry. | 2) It occurs with racemization of stereochemistry. | 3) It proceeds through the more stable carbocation intermediate. | 4) The C-H and C-X bonds that break must be anti. |
|---|--|--|---|
- 4) Which compound is least acidic? (1)
- | | | | |
|---------------------------------------|--|--|---------------------------------------|
| 1) FCH ₂ CO ₂ H | 2) ClCH ₂ CO ₂ H | 3) BrCH ₂ CO ₂ H | 4) ICH ₂ CO ₂ H |
|---------------------------------------|--|--|---------------------------------------|
- 5) Aspirin is an acetylation product of (1)
- | | | | |
|--------------------------|-----------------------|--------------------------|-----------------------|
| 1) O-hydroxybenzoic acid | 2) O-dihydroxybenzene | 3) m-hydroxybenzoic acid | 4) p-dihydroxybenzene |
|--------------------------|-----------------------|--------------------------|-----------------------|
- 6) Alkyl halides react with metallic sodium in dry ether producing? (1)
- | | | | |
|---|---|--|--|
| 1) Alkanes with same number of carbon atoms | 2) Alkanes with double number of carbon atoms | 3) Alkenes with triple number of carbon atom | 4) Alkenes with the same number of carbon atoms. |
|---|---|--|--|
- 7) In primary alkyl halides, carbon attached to the halogen atom is further attached to how many carbon atoms? (1)
- | | | | |
|------|------|------|------|
| 1) 1 | 2) 2 | 3) 3 | 4) 4 |
|------|------|------|------|
- 8) Oxidation test of alcohol using KMnO₄ in presence of acetic acid is called as (1)
- | | | | |
|----------------|-------------------|---------------|-----------------------|
| 1) Ritter Test | 2) Esterification | 3) Lucas test | 4) Victor meayer test |
|----------------|-------------------|---------------|-----------------------|
- 9) Losing a small molecule from the original organic molecule is (1)
- | | | | |
|-------------------------|--------------------------|----------------------|----------------------|
| 1) elimination reaction | 2) substitution reaction | 3) addition reaction | 4) none of the above |
|-------------------------|--------------------------|----------------------|----------------------|
- 10) The irritation caused by red ants bite is due to (1)
- | | | | |
|--------------|----------------|----------------|----------------|
| 1) Uric acid | 2) Acetic acid | 3) Lactic acid | 4) Formic acid |
|--------------|----------------|----------------|----------------|
- 11) Select the IUPAC name for: (CH₃)₂CHCH(OH)CH₂C(CH₃)₃. (1)
- | | | | |
|------------------------------|-------------------------------|----------------------------|---------------------------|
| 1) 2,5,5-trimethyl-3-hexanol | 2) 1,1,4,4-pentamethylbutanol | 3) 1,1-dimethylisopentanol | 4) 2,5-dimethyl-4-hexanol |
|------------------------------|-------------------------------|----------------------------|---------------------------|
- 12) The reaction used in the conversion of alkenes to an equimolar mixture of aldehydes and ketones (1)

| | | | |
|---------------|---------------|--------------------------|---------------------------|
| 1) Ozonolysis | 2) Hydrolysis | 3) Nucleophilic addition | 4) Electrophilic addition |
|---------------|---------------|--------------------------|---------------------------|

- 13) The nucleophilic addition reactions of aldehydes are carried out in following medium if the incoming nucleophile is weak (1)

| | | | |
|------------|-----------|-----------------|--------------------|
| 1) Neutral | 2) Acidic | 3) weakly basic | 4) extremely basic |
|------------|-----------|-----------------|--------------------|

- 14) What is the correct order of reactivity of the following towards nucleophilic addition? (1)

| | | | |
|--|--|--|--|
| 1) Formaldehyde > Acetaldehyde > Acetone | 2) Acetone > Acetaldehyde > Formaldehyde | 3) Formaldehyde > Acetone > Acetaldehyde | 4) Acetaldehyde > Formaldehyde > Acetone |
|--|--|--|--|

- 15) Shape and type of hybridization found in methyl cation (CH_3^+) are

| | | | |
|---|--------------------------------------|---|--------------------------------------|
| 1) Trigonal pyramidal and sp^2 | 2) Trigonal planar and sp^2 | 3) Trigonal pyramidal and sp^3 | 4) Trigonal planar and sp^3 |
|---|--------------------------------------|---|--------------------------------------|

- 16) The discoverer of peroxide effect in alkene addition (1)

| | | | |
|---------------|------------|--------------------|-------------|
| 1) Markonikov | 2) Zaitsev | 3) Vladimir Ivanov | 4) Kharasch |
|---------------|------------|--------------------|-------------|

- 17) Which of the following is not an electrophile? (1)

| | | | |
|-------------------------|------------------|-----------------|------------------|
| 1) H_2O | 2) Cl_2 | 3) HBr | 4) Br_2 |
|-------------------------|------------------|-----------------|------------------|

- 18) Which of the following will undergo self aldol condensation in the presence of dil. NaOH ? (1)

| | | | |
|---------------------------------|-------------------------------|---------------------------------------|-------------------------------------|
| 1) $\text{CH}_2 = \text{CHCHO}$ | 2) $\text{CH} = \text{C-CHO}$ | 3) $\text{CH}_3\text{CH}_2\text{CHO}$ | 4) $\text{C}_6\text{H}_5\text{CHO}$ |
|---------------------------------|-------------------------------|---------------------------------------|-------------------------------------|

- 19) Which of the following has most acidic hydrogen? (1)

| | | | |
|---------------|--------------------|--------------------|--------------------|
| 1) 3-Hexanone | 2) 2,4-Hexanedione | 3) 2,3-Hexanedione | 4) 2,5-Hexanedione |
|---------------|--------------------|--------------------|--------------------|

- 20) Which of the following will give a corresponding aldehyde or ketone upon oxidation? (1)

| | | | |
|----------------------|---------------------|------------------------------|-----------|
| 1) ortho-Nitrophenol | 2) 2-Hydroxypropane | 3) 2-Methyl-2-hydroxypropane | 4) Phenol |
|----------------------|---------------------|------------------------------|-----------|

II Long Answers

Answer all the questions.

Answer all questions

- Explain the reactions of alkyl halide with metals 5 marks
 - Write the comparison of $\text{S}_\text{N}1$ and $\text{S}_\text{N}2$ reaction 5 marks
- What is kinetic and thermodynamic control of a reaction? Explain 1, 2 and 1, 4 addition of a conjugated diene with suitable example. (1+4=5 marks)
 - What is peroxide effect? Explain the mechanism of peroxide initiated free radical addition of alkenes with suitable illustration. (1+4=5 marks)

III Short Answers

Answer all the questions.

Answer all questions

- State Saytzeff's Rule and explain with suitable example. (5)
- Why acetic acid is stronger acid than the ethanol? Explain (5)
- Write the structure IUPAC name and medicinal uses for the following compounds (5)
 - Oil of wintergreen
 - Benzoic acid
 - Aspirin
- Give structures for the following IUPAC names (5)
 - 3,5-dimethyl-4-propylhept-1-en-6-yne
 - 4-Bromo-3-methylpent-2-ene
 - 2,4-dimethylpentanoic acid
 - ethyl pentanoate

e. 3-Oxo-Heptanoic acid

- 5) How will you convert benzaldehyde to 2-hydroxy-1,2 di(phenyl)ethanone? Explain with suitable mechanism. (5)
- 6) Write the structure and one use for the following compounds (5)
- a. Hexamine
 - b. Vanillin
 - c. Cinnamaldehyde
 - d. Paraldehyde
 - e. Chloral Hydrate
- 7) What is isomerism? Explain the structural isomerism with one example each class. (5)

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