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SARDAĀ PATEL UNIVERSITY  
M. Sc Pharmaceutical Chemistry (Semester-I) Examination  
Thursday, 27/10/2016; Time-10:00 AM to 01:00 PM  
SUBJECT CODE: PS01CPCH03  
SUBJECT TITLE: Basic Chemistry for Pharmaceuticals

Maximum Marks: 70

- Note: (1) All questions are compulsory.  
(2) Figure to right indicates total marks of question.

Q-1 Choose the correct option for the following:

1 × 8

- When the carbon atom is  $sp^2$  hybridized in a compound, it is bonded to
  - 5 other atoms
  - 4 other atoms
  - 2 other atoms
  - 3 other atoms
- Which of the following hydrocarbons has the shortest C-C bond
  - $CH_2=CH_2$
  - $CH_3-CH_3$
  - $CH\equiv CH$
  - None
- Which of the following is not a nucleophile.
  - $NH_3$
  - $HSO_3^-$
  - $AlCl_3$
  - $OH^-$
- Which of the following is an electrophile
  - $CH_3O^-$
  - $CH_3CH_2^+$
  - $NH_3$
  - $CH_3CH_2^-$
- The carbon atoms in a benzene rings are
  - $sp$  hybridized
  - $sp^2$  hybridized
  - $sp^3$  hybridized
  - None
- Which of the following is not aromatic
  - pyridine
  - Pyrrole
  - Furan
  - Ethylene
- Tap water contains impurities of
  - $Ca^{2+}$ ,  $Mg^{2+}$ ,  $Na^+$  ions
  - $Cl^-$ ,  $CO_3^{2-}$ ,  $SO_4^{2-}$
  - Neutral
  - None of above
- In the limit test for Arsenic, arsenic converted into
  - Arsine ( $AsH_3$ )
  - $As_2S_3$
  - $AsCl_3$
  - None

Q-2 Answer the following (Any Seven).

2 × 7

- Indicate the type of hybridization of each atom in the following structure:
  - $CH_3CH_3$
  - $CH_3C\equiv CCH_3$
- Define hemolytic fission with suitable example?
- Explain why phenol is nitrated more readily than benzene.
- Elaborate el mechanism with suitable example.

5. Define Huckel's rule?
6. Describe that anthracene is aromatic compound.
7. Describe the limit test for lead?
8. Define assay of tolerances.
9. What is the Heavy metal impurities?
- Q-3 A. Write a note on 6  
 a. sp<sup>3</sup> hybridization  
 b. sp<sup>2</sup> hybridization
- B. Describe Carbenes, Nitrenes and benzyne with suitable example. 6
- OR**
- B. Write a note on factors which influence a reaction. 6
- Q-4 A. Explain why amino group (-NH<sub>2</sub>) acts an ortho, para director while nitro (-NO<sub>2</sub>) act as a meta-director. 6
- B. Describe the nitration and Friedel Craft's alkylation of benzene. 6
- OR**
- B. Write a note on Phase transfer catalyst and Crown ethers. 6
- Q-5 A. Describe the structure of benzene. 6
- B. Explain why:  
 a. Pyridine is more basic than pyrrole 6  
 b. Pyridine undergoes nucleophilic substitution at 2- position.
- OR** 6
- B. How is furan synthesized? Describe its important reactions.
- Q-6 A. Write note on Major sources of impurities. 6
- B. Describe the pharmacopeial methods for the control of impurities. 6
- OR**
- B. Describe the major sources of errors. 6

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