

May 2017

APPLIED CHEMISTRY

Time Allowed: 2 Hours

Full Marks: 35

Answer to Question No.1 is compulsory and to be answered first.

This answer is to be made in separate loose script(s) provided for the purpose.

Maximum time allowed is 30 minutes, after which the loose answer scripts will be collected and fresh answer scripts for answering the remaining part of the question will be provided.

On early submission of answer scripts of Question No.1,

a student will get the remaining script earlier.

Answer any five questions from Group-A, B & C, taking at least one from each group.

1. Choose the correct answer from the given alternatives (any ten): 10x1
- i) Container for preserving food materials requires plating with – (a) Ni, (b) Zn, (c) Cu, (d) Sn.
 - ii) Which material is not required to determine calorific value of coal by Bomb Calorimeter? – (a) N₂, (b) O₂, (c) Beckman Thermometer, (d) Magnesium Wire.
 - iii) The nitrating reagent to benzene is – (a) concentrated HNO₃, (b) concentrated H₂SO₄ and concentrated HNO₃, (c) NaNO₃, (d) anhydrous AlCl₃+HNO₃.
 - iv) The anti-knock compound is – (a) AlCl₃, (b) NaNO₂, (c) TEL, (d) Na₂SO₄.
 - v) Asbestos is – (a) sodium permutit, (b) calcium magnesium silicate, (c) magnesium phosphate, (d) sodium silicate.
 - vi) Monomer of NEOPRENE rubber is – (a) isoprene, (b) butadiene, (c) styrene, (d) chloroprene.
 - vii) Ceramics are made from – (a) clay, feldspar, silica, talc, (b) gypsum, silica, talc, (c) feldspar, gypsum, cement, (d) silica, graphite, clay.
 - viii) Example of thinner is – (a) soyabean oil, (b) linseed oil, (c) turpentine oil, (d) castor oil.
 - ix) Cetane number of fuel is the % of – (a) isooctane in a mixture of isocetane and n-heptane, (b) n-hexadecane in a mixture of n-hexadecane & n-heptane, (c) n-hexadecane in a mixture of n-hexadecane and iso octane, (d) n-hexadecane in a mixture of 1-methul naphthalene & n-hexadecane.
 - x) Which gas is mainly present in bio gas? – (a) acetylene, (b) butane, (c) propene, (d) methane.
 - xi) Which gas may cause death to living system? – (a) carbon monoxide, (b) sulphur dioxide, (c) carbon dioxide, (d) methane.
 - xii) Vulcanizing agent is – (a) graphite, (b) sulphur, (c) KCl, (d) phosphorus.

Group-A

2. a) What is coupling reaction? Give one example.
 b) How can you identify butanone by chemical test? Give necessary reaction. (1+2)+2
- OR**
- a) Define cement mortar. Mention its use.
 b) What is CORK? What is its use?
 c) Write uses of boron carbide. 2+2+1

3. a) Write the principle, including reactions to prepare producer gas.
b) Mention three different products obtained on fractional distillation of liquid petroleum. Give one use of each. 2+3
4. a) Classify lubricants. Briefly describe each of them. 3+2
b) Write one use of each.
5. A coal sample contain 90% C, 5% H, 1% S, 2% O. Calculate the quantity of air required for burning of 100 kg of coal. [Given: air contains 21% by weight of oxygen] 5

Group-B

6. a) Write two differences between paints and varnishes. 2+3
b) What are VEHICLE & THINNER in preparation of paint? Give one example of each.
7. a) What is the cause of corrosion? 2+3
b) Explain electrochemical corrosion with example.
8. a) Write two differences between thermosetting and thermoplastic.
b) Write the name and formula of raw materials for preparation of – (i) DACRON, (ii) BUTYL RUBBER. Show the structure of (i) & (ii). 2+3

Group-C

9. a) Define BOD and COD. 3+2
b) What are the sources of SO_2 and oxide of nitrogen?
10. a) How is sewage water purified before falling to river? 3+2
b) Explain how do the green house gases affect the environment?