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 <u>any five</u> questions from Group-A, B & C, taking <u>at least one</u> from each group.

1. Choose the correct answer from the given alternatives (any ten): 10x1

i) Which catalyst is used for cracking? – (a) MnO_2, (b) $Al_2O_3 - SiO_2$, (c) Na_2SiO_3, (d) NiO.

ii) Formula of Plaster of Paris is – (a) $CaSO_4.½H_2O$, (b) $CaSO_4.2H_2O$, (c) $CaSO_4$, (d) $CaCO_3$.

iii) Metal used for cathodic protection is – (a) *Mg*, (b) *Ca*, (c) *Cr*, (d) *Mn*.

iv) Plastic used in non-sticky pan is – (a) Polypropylene, (b) Buna-N, (c) PVC, (d) Teflon.

v) What is the raw material for Dacron? – (a) $Al(OC_2H_5)_3$, (b) hexamethylene diamine & adipic acid, (c) ethylene glycol and terephthalic acid, (d) phenol and formaldehyde.

vi) Container for preserving food materials requires plating with – (a) *Ni*, (b) *Ti*, (c) *Sn*, (d) *Zn*.

vii) pH range for drinking water should be – (a) 11-13, (b) 6.5-8.5, (c) 3-5, (d) 5-7.

viii) Rayon is prepared from – (a) pyne apple leave, (b) wool, (c) jute, (d) cotton.

ix) Reagent used to distinguish 2-propanol and butane-1-0 *l* is – (a) *NaOH*, (b) C_6H_6, (c) I_2+*NaOH*, (d) *KCN*.

x) Which one is not anti-knock compound? – (a) *TEL*, (b) $FeCl_3$, (c) $Fe(CO)_5$, (d) methyl tert. butyl ether.

xi) Chief ingredient of bio gas is – (a) CH_4, (b) C_2H_6, (c) C_2H_4, (d) C_2H_2.

xii) What variety of coal contains highest % of carbon? – (a) Anthracyte, (b) Bituminous, (c) Lignite, (d) Peat.

xiii) Which gas does not involve in producing SMOG? – (a) NO_2, (b) SO_2, (c) H_2S, (d) *CO*.

xiv) Vulcanizing agent, which is mostly used, is – (a) CS_2, (b) *CO*, (c) H_2S, (d) *S*.

<u>Group-A</u>

2. a) Explain the different changes with reactions that occur during setting and hardening of cement.
b) What is cement mortar and cement concrete? 3+2

3. a) Mention two uses of amyl acetate.
b) What are the reagents to nitrate benzene?
c) What is coupling reaction? Explain it by the example of phenol and aniline. 1+1+3

of each. 5

5. a) Classify lubricant and write example and one use of each.
   b) Define pour point.
   c) How is % of sulphur determined in coal? 3+1+1

Group-B

6. a) What is the formula of boron carbide and carborandum? Write one use of each.
   b) What is the cause of corrosion?
   c) Write notes on 'electrochemical corrosion'. (1+1)+1+2

7. a) Mention two differences between paints and varnishes.
   b) Give two ingredients of varnishes with examples.
   c) Which is whitest pigment? 2+2+1

8. a) Write the name and formula of raw materials to prepare – (i) Nylon 6:6, (ii) Orlon, (iii) Neoprene.
   b) What are two differences between thermoplastic and thermosetting plastic? (1x3)+2

Group-C

9. a) Define – (i) BOD, and (ii) COD.
   b) Give two examples of green house gas. How do they affect on living system? (1½x2)+(1x2)

10. a) What is the principle of 'cottrel precipitator'?
    b) How does domestic and industrial waste cause water pollution? 2+3