Post Graduate Diploma in Analytical Chemistry (PGDAC)

MARCH EXAMINATION 2021

COURSE CODE: MCHL-003 COURSE TITLE: Spectroscopics MethodsLab (Credits: 2)

Time: ½ Hour **Maximum Marks: 25**

Please fill up the following particulars:

Enrolment No. in Figures

Enrollment No. in Words

Examination Centre Code

Day and Date ……..

Medium (English/Hindi)……

Name of Examinee……

Signature of Examinee…….

Signature of Invigilator……

To be filled only by the Evaluator

Marks Obtained……

Signature of the Evaluator…….

Name of the Evaluator…… **……**

Evaluator Code:……..…….. **Seal of Centre Superintendent with Centre Code**

Note for Examinee:

i) This is an objective type question paper.

ii) This question paper consists of 15 questions. **You have to attempt only 10 questions**. Each question carries 2½ marks.

iii) Each question has four alternatives, only one of which is correct. Mark the correct alternative on the question paper itself by putting the tick mark √ in the box given against it.

ON COMPLETION, IT IS COMPULSORY FOR YOU TO SUBMIT THIS QUESTION PAPER TO YOUR INVIGILATOR.

1. In UV-visible absorption spectrophotometry, the colour intensity is not affected by:

i) change of pH over the range 2-9 ☐
ii) pH over a range of 8-10 ☐
iii) concentration of solution ☐
iv) presence of cations like, Ag^+ ☐

2. Full form of DMG is:

i) Dimethylglyoxime ☐
ii) Dimethyleneglyoxime ☐

iii) Dimethylglucose ☐
iv) Dimethylene glucose ☐

3. Determination of chromium and manganese in a mixture the orange red coloured dichromate shows maximum absorption (λ_{max}) at:

i) 345 nm ☐ iii) 440 nm ☐
ii) 200 nm ☐ iv) 1000 nm ☐

4. Aldehydes group absorb in the UV region of the electromagnetic spectrum and give:

i) 1 band ☐ iii) 3 band ☐
ii) 2 band ☐ iv) 4 band ☐
v)

5. For methyl red the Henderson-Hasselbach equation is:

i) $pH = pK_a + \log\frac{[MR^-]}{[HMR]}$ ☐

ii) $pH = pK_a + \log\frac{[MR^-]}{[HMR]}$ ☐

iii) $pK_a = pH + \log\frac{[MR^-]}{[HMR]}$ ☐

iv) $pH = pK_a + \log\frac{[MR^+]}{[HMR]}$ ☐ ☐

6. During spectroscopic determination of nickel, red colour is developed by the reaction of

i) nickel and DMG ☐ iii) DMG and acetic acid ☐
ii) nickel and acetic acid ☐ iv) DMC, nickel and acetic acid ☐

7. IR Frequency range (cm^{-1}) for Aldehydes is :

i) 3200-2500 ☐ iii) 3600-3200 ☐
ii) 1750-1705 ☐ iv) 2260-2200 ☐

8. The broadened signel in the NMR spectrum indicates:

i) NH_3 ☐
ii) $-CH_3$ ☐
iii) -OH ☐
iv) $-CH_2$ ☐

9. Three protons of propyl alcohol appear at δ

i) 1.57 ☐
ii) 2.0 ☐
iii) 0.94 ☐
iv) 2.3 ☐

10. The =C – H stretch in aromatic ring is observed at :

i) 3100-3000 cm^{-1} ☐
ii) 3000 cm^{-1} ☐
iii) 4000 cm^{-1} ☐
iv) 250-270 cm^{-1} ☐

11. In flame photometric spectroscopy the wavelength of the radiation emitted indicates

i) concentration of the compound ☐
ii) identity of the element ☐
iii) identity of the substance ☐
iv) amount of the substance ☐

12. The finger print region in IR spectrum is;

i) 4000-5000 cm^{-1} ☐
ii) 2000-1000 cm^{-1} ☐
iii) 1300-900 cm^{-1} ☐
iv) 800-500 cm^{-1} ☐

13. The spin-spin splitting pattern in the NMR spectrum gives information about the:

i) no. of neighbouring carbons ☐
ii) no. of protons ☐
iii) no. of neighbouring protons ☐
iv) electronic environment of protons ☐

14. The odd molecular mass peak is indicative of the presence of :

ii) oxygen atom ☐
ii) hydrogen atom ☐
iii) nitrogen atom ☐
iv) chlorine atom ☐

15. In turbidimetric determinations, the intensity of scattered light depends upon….

i) number and size of the suspended particles ☐
ii) only on size of the suspended particles ☐
iii) only on the number of the suspended particles ☐
iv) neither the number nor the size of the suspended particles. ☐