

2020

CHEMISTRY (Honours)

Paper Code : XII-A & B
(Analytical and Industrial)
[New Syllabus]

Full Marks : 65

Time : Three Hours

Important Instructions for Multiple Choice Question (MCQ)

- Write Subject Name and Code, Registration number, Session and Roll number in the space provided on the Answer Script.

Example : Such as for Paper III-A (MCQ) and III-B (Descriptive).

Subject Code :

III	A	&	B
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Subject Name :

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- Candidates are required to attempt all questions (MCQ). Below each question, four alternatives are given [i.e. (A), (B), (C), (D)]. Only one of these alternatives is 'CORRECT' answer. The candidate has to write the Correct Alternative [i.e. (A)/(B)/(C)/(D)] against each Question No. in the Answer Script.

Example — If alternative A of 1 is correct, then write :

1. — A

- There is no negative marking for wrong answer.

মাল্টিপল চয়েস প্রশ্নের (MCQ) জন্য জরুরী নির্দেশাবলী

- উত্তরপত্রে নির্দেশিত স্থানে বিষয়ের (Subject) নাম এবং কোড, রেজিস্ট্রেশন নম্বর, সেশন এবং রোল নম্বর লিখতে হবে।

উদাহরণ — যেমন Paper III-A (MCQ) এবং III-B (Descriptive)।

Subject Code : III A & B

Subject Name :

- পরীক্ষার্থীদের সবগুলি প্রশ্নের (MCQ) উত্তর দিতে হবে। প্রতিটি প্রশ্নে চারটি করে সম্ভাব্য উত্তর, যথাক্রমে (A), (B), (C) এবং (D) করে দেওয়া আছে। পরীক্ষার্থীকে তার উত্তরের স্বপক্ষে (A) / (B) / (C) / (D) সঠিক বিকল্পটিকে প্রশ্ন নম্বর উল্লেখসহ উত্তরপত্রে লিখতে হবে।

উদাহরণ — যদি 1 নম্বর প্রশ্নের সঠিক উত্তর A হয় তবে লিখতে হবে :

1. – A

- ভুল উত্তরের জন্য কোন নেগেটিভ মার্কিং নেই।

Paper Code : XII-A

Full Marks : 15

Time : Thirty Minutes

Choose the correct answer.

Each question carries 1 mark.

1. The precipitation should be carried in presence of an electrolyte to avoid----

- (A) Co-precipitation
- (B) Post-precipitation
- (C) Super saturation
- (D) Coagulation

2. NPK Fertilizer is synthesized starting from-----

- (A) $\text{H}_3\text{PO}_4 + \text{HCl}$
- (B) $\text{H}_3\text{PO}_4 + \text{H}_2\text{SO}_4$
- (C) $\text{H}_2\text{SO}_4 + \text{HNO}_3$
- (D) None of them

3. Which among the following is an output device?

- (A) Key board
- (B) Mouse
- (C) Printer
- (D) Scanner

4. Nylon 66 is not a----

- (A) Condensation polymer
- (B) Polyamide
- (C) Co-polymer
- (D) Homo polymer

5. Which of the following is not a natural fibre?

- (A) Silk
- (B) Wool
- (C) Viscose rayon
- (D) Cotton

6. Which one of the following is not an example of white pigment?

- (A) Titanium dioxide
- (B) Lithopone
- (C) Zinc oxide
- (D) Chromium oxide

7. The main alloying component in all stainless steel metals is
(A) Copper
(B) Carbon
(C) Chromium
(D) Nickel
8. Among the following which one is not a computer language?
(A) FORTRAN
(B) COBOL
(C) Windows 95
(D) BASIC
9. The major component of window glass
(A) Al_2O_3
(B) SiO_2
(C) CaO
(D) Fe_2O_3
10. Which one among the following is not an operating system?
(A) Windows 98
(B) Java
(C) Linux
(D) Windows XP
11. Calcium cyanamide mixed with carbon is known as-----
(A) Nitrolim
(B) suphala-20:20:0
(C) Gromor-14-35-14
(D) DAP
12. The most suitable precipitant for estimation of Ni^{2+} is
(A) Cupferron
(B) Dimethyl glyoxime
(C) EDTA
(D) Oxine
13. Reversed phase chromatography uses a stationary phase which is _____ in nature.
(A) Hydrophobic
(B) Hydrophilic
(C) Both of the above
(D) None of the above

14. Which one of the following errors follow the Normal distribution or Gaussian curve?

- (A) Instrumental error
- (B) Operative error
- (C) Methodic error
- (D) Random error

15. Pb_3O_4 is a widely used pigment, is known as

- (A) white lead
 - (B) red lead
 - (C) lithophone
 - (D) chrome green
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2020

CHEMISTRY (Honours)

Paper Code : XII-B
(Analytical and Industrial)
[New Syllabus]

Full Marks : 50

Time : Two Hours Thirty Minutes

*The figures in the margin indicate full marks.*Answer any *five* questions taking at least *two* questions from each Group.**Group - A**

1. (a) Five careful determination of percentage of manganese in pyrolusite ore by volumetric analysis are 67.48, 67.37, 67.43, 67.40 and 67.47. Find out the standard deviation of the mean. For the calculation of standard deviation why N-1 is used in the denominator instead of N? 3+1=4
- (b) What do you mean by least square method? 2
- (c) Convert (11011)₂ into its decimal equivalent. 1
- (d) What are the differences between post-precipitation and co-precipitation? How is post precipitation avoided during gravimetric analysis? 2+1=3
2. (a) Explain why binary coding are used for storing information in computer memory? 2
- (b) Write the full forms of (i) ASCII and (ii) BASIC. 2
- (c) In a titrimetric analysis, normality of a solution was reported to be 0.1041, 0.1039, 0.1049 and 0.1043 in four sets experiment. Evaluate relative mean deviation and coefficient of variation from these results. 3
- (d) How systematic error can be minimized? 3
3. (a) Calculate the 'gravimetric factor for estimation of nickel as its complex with dimethyl glyoxime (DMG). (Given at wt. of Ni = 58.71, C=12, N=14, O=16 and H = 1). 4
- (b) Explain how amino acids can be separated by using ion-exchange process. 2
- (c) The distribution constant for iodine between an organic solvent and water is 85. Find the concentration of, remaining in the aqueous layer after extraction of 50 ml of 1.00×10^{-3} (M) I₂ with the following quantities of organic solvent (i) 50.0 ml in one portion (ii) five 10.0 ml portions. 1+1=2
- (d) What do you mean by frequency distribution curve? 2

4. (a) 'Paper chromatography is a kind of partition chromatography' - Comment. 2
 (b) Mention the factors on which the R_f value depends. 2
 (c) The following set of Fe (II) analysis with $KMnO_4$ in acidic medium was reported. One value appears suspected. Determine whether it can be ascribed to accidental error or not: 20, 22, 29, 23, 24, mg/L. ('Q' at 90% confidence limit for the observations is 0.64). 2
 (d) What is peptization? How can it be avoided? 1+1=2
 (e) What do you mean by 'synergistic extraction'? 2

Group - B

5. (a) Give the average chemical composition of common glass? How is glass annealed and why? 2+2 = 4
 (b) What is triple superphosphate? 2
 (c) Write different reactions which occur during vulcanization of rubber? 2
 (d) Write the preparation and use of dithio carbamate. 1+1=2
6. (a) Why Nylon 66 and Nylon 6 are called '*silk-like*' fibres? 2
 (b) What do you mean by natural gasoline and aviation gasoline? 3
 (c) What are the disadvantages of solid fuels over liquid and gaseous fuel? 2
 (d) Describe Bergius process with a flow diagram for obtaining synthetic gasoline from coal. 3
7. (a) Explain unsoundness of portland cement. What is the difference between mortar and concrete? 2+2=4
 (b) Why annealing is required during the manufacturing process of steel? 2
 (c) Write down the important purposes of making alloy. 2
 (d) What is latex? Write down its main constituents. 2
8. (a) 'The octane number of petrol used commonly in our country is ~86'. What is the Octane number and what is the meaning of the above statement? 3
 (b) What do you mean by contact insecticide? Give one example. 2
 (c) How does aldrin is prepared? Mention one of its uses. 2
 (d) What raw materials are used for the production of terylene? 2
 (e) Why tetraethyl lead is added to fuel used for internal combustion of engine? 1