

# Barishal Board-2017

Chemistry First Paper

Subject Code

1 7 6

Time — 2 hours 35 minutes

Creative Essay Type

Full marks — 50

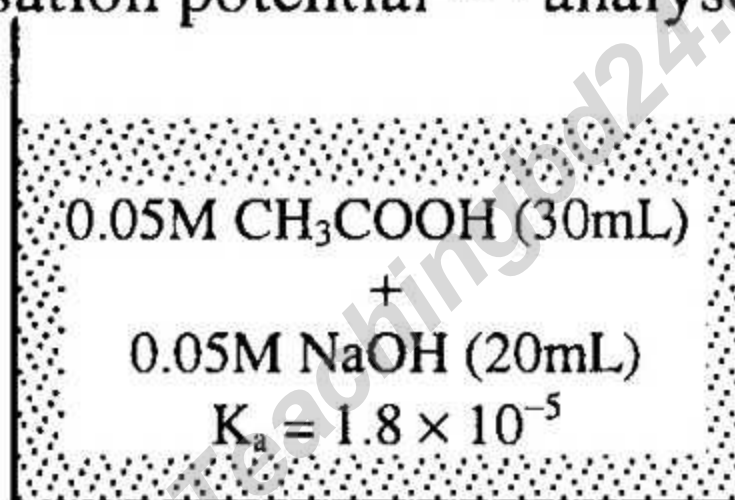
[N.B. -The figures in the right margin indicate full marks. Read the stems carefully and answer the associated questions. Answer any five questions.]

1. ►

Atomic number	3	4	5	6	7	8	9
Ionisation potential (kJ/mol)	520	899	801	1080	1402	1314	1680

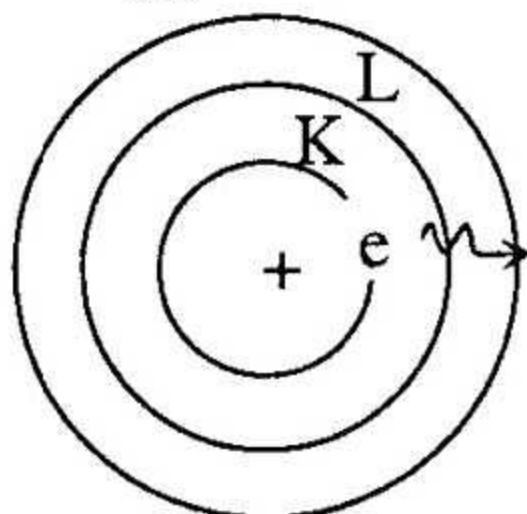
- What is homogenous catalysis? 1
- Calculate the energy of spectrum having wavelength of 675 nm. 2
- How does the size of the elements given in the stem change? Explain. 3
- According to the stem, there is deviation in the order of ionisation potential — analyse. 4

2. ►



- What is Pauli's exclusion principle? 1
- Why is water bath used in the laboratory? 2
- How would you calculate the pH of the stem's solution? 3
- Will there be a change in pH of the given solution, if a small amount of acid or base is added to it? Write giving reasons. 4

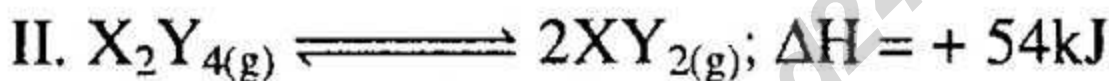
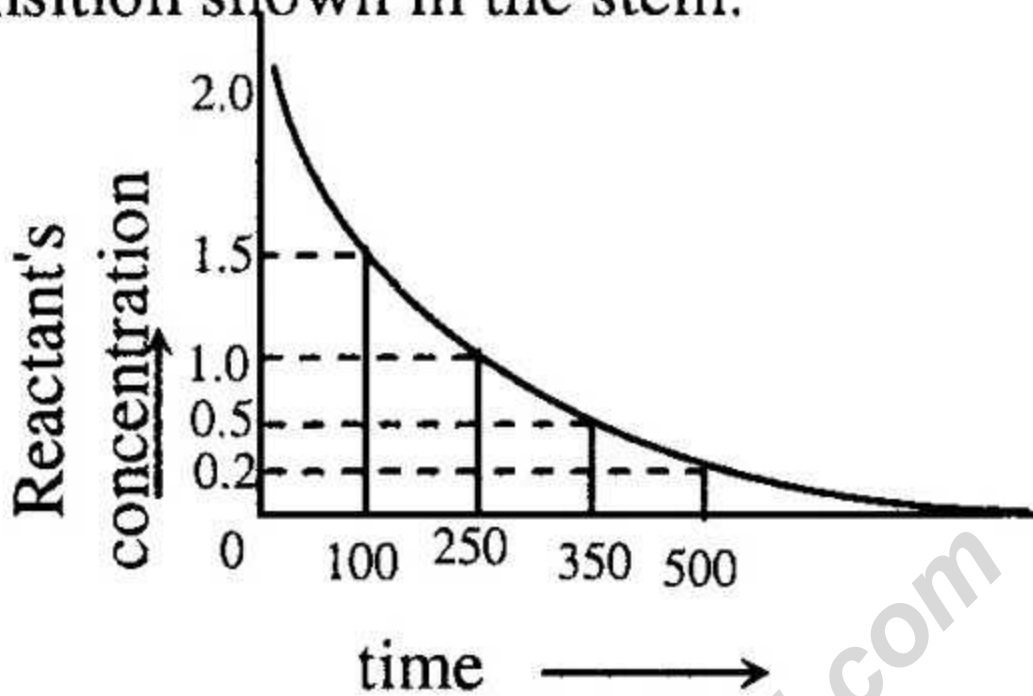
3. ★



- What is electronegativity? 1
- Explain the buffer action of blood. 2
- Discuss the model of the atomic structure with reference to the figure given in the stem. 3
- Consider the model as hydrogen atom. Calculate the absorbed energy and its frequency for the electronic transition shown in the stem. 4

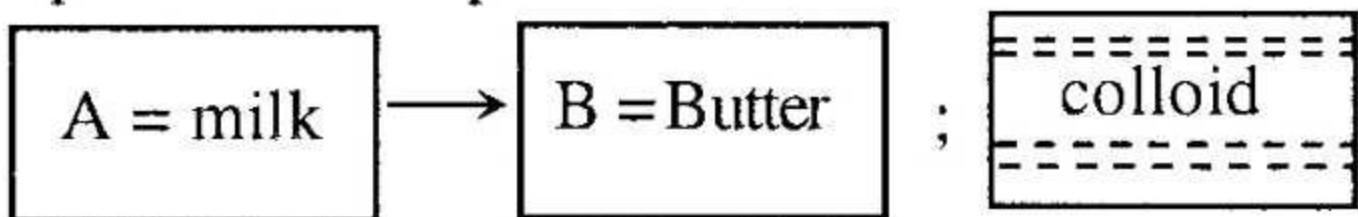
4. ➤

I.



- What is transition element? 1
- Explain the use of UV-radiation in detecting the fake currency notes. 2
- According to I of the stem the concentration of reactant decreases from  $1.5 \text{ mol.L}^{-1}$  to  $0.5 \text{ mol.L}^{-1}$ . Calculate the reaction rate. 3
- The reaction, II is affected by pressure and temperature — explain. 4

5. ➤

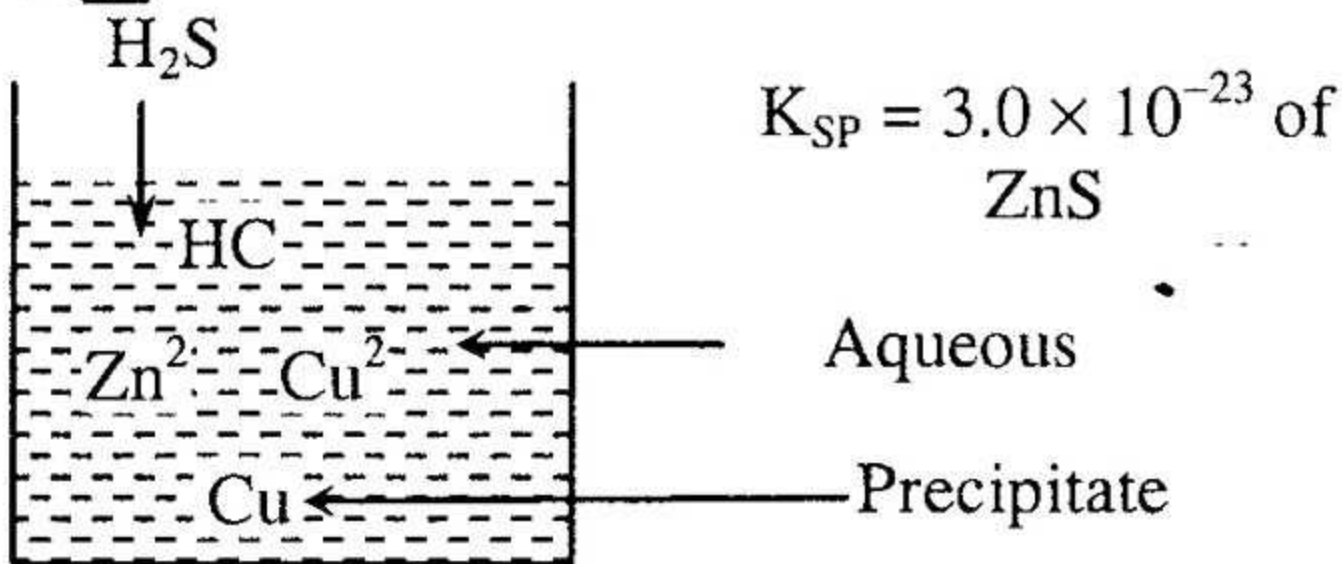


Part I

Part II

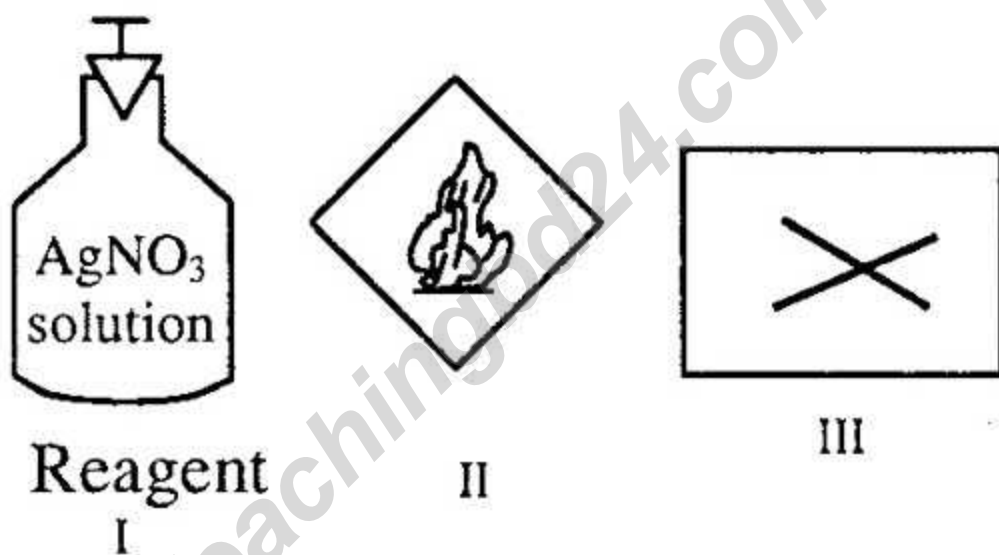
- What is a rider constant? 1
- $\text{CO}_2$  is a gas, but  $\text{SiO}_2$  is solid. Why? 2
- Describe the preparation of B from A as per stem. 3
- In general condition, the particles of part II do not coagulate, but they can be coagulated by addition of electrolyte — Analyse. 4

6. ★



- What is heat of solution? 1
- The bond angle of  $NH_3$  molecule is  $107^\circ$ . Why? 2
- Calculate the solubility of the precipitate shown in the stem. 3
- The two ions given in the stem do not precipitate simultaneously — Analyse with justification. 4

7. ▶



- Write down the law of mass action. 1
- How are polar compounds formed? 2
- How can the reagent of fig I be stored free from contamination? Describe. 3
- Special measures have to be taken for the after-use safe disposal of the chemicals symbolised by fig. II and III. Explain giving logical reasons. 4

8. ★ The outermost electronic configurations of  $A^{2+}$  and  $B^{2+}$  ions are  $3d^9$  and  $3d^{10}$ .

- What is food security? 1
- Why is concentrated HCl used in flame test? 2
- Discuss the formation process of  $[A(NH_3)_4]^{2+}$ . 3
- The  $[A(NH_3)_4]^{2+}$  ion is coloured but  $[B(NH_3)_4]^{2+}$  ion is colourless — explain. 4

[N.B. Choose the best answer among the options. Fill the circle in the answer sheet with ball point pen. Each question has value 1.]

1. In which animal's milk the amount of protein is the highest?

- (a) Human (b) Cow  
(c) Buffalo (d) Sheep

2. Which of the following works cannot be done in the laboratory?

- i. eating ii. drinking  
iii. breathing

Which one is correct?

- (a) i & ii (b) i & iii  
(c) ii & iii (d) i, ii & iii

3. **★** The following weights are placed on the right pan of Paul-Bungee balance: 5g + 2g + 1g + 500mg + 20 mg. The rider of 10 mg weight is put on the 10<sup>th</sup> scale. What is the weight of the substance?

- (a) 8.518g (b) 8.522g  
(c) 538g (d) 548g

4. The presence of which of the following bonds water is a liquid at room temperature?

- (a) ionic bond (b) covalent bond  
(c) coordinate bond  
(d) hydrogen bond

5. What type of compounds is denoted by [Xi] symbol?

- (a) irritant (b) explosive  
(c) harmful (d) pollutant

6. What is MRI?

- (a) Magnetic infrared radiation  
(b) Magnetic resonance imaging  
(c) Nuclear magnetic resonance  
(d) Magnetic radio imaging

7. What is understood by reaction rate?

- i. rate of decrease of concentration of reactant  
ii. rate of increase of amount of catalyst  
iii. rate of increase of concentration of product

Which one is correct?

- (a) i & ii (b) ii & iii  
(c) i & iii (d) i, ii & iii

8. Salt of higher fatty acid is —

- (a) Glycerine  
(b) Detergent  
(c) Bleaching powder  
(d) Soap

Observe the stem and answer to question numbers 9 and 10.

Compound	Boiling point	Dissociation temperature
A	90°C	110°C
B	110°C	90°C
C	120°C	150°C

9. What is the process employed to separate the components from the mixture AB?

- (a) vacuum distillation  
(b) steam distillation  
(c) fractional distillation  
(d) sublimation

10. AC mixture can be easily separated than AB mixture, because —

- i. the boiling point difference between A & C is higher  
ii. B is dissociated before the boiling point  
iii. fractional column is used in separation of A & C

Which is correct?

- (a) i & ii (b) i & iii  
(c) ii & iii (d) i, ii & iii

11. **★** P, Q and R are three elements having electronegativities of 2.1, 3.0 and 3.4 respectively. Consider the following information:

- i. PQ is a polar covalent compound  
ii. PR has less ionic property than PQ  
iii. QR is a pure covalent compound

Which one is correct?

- (a) i & ii (b) ii & iii  
(c) i & iii (d) i, ii & iii

12. The value of bond angle of H<sub>2</sub>O —

- (a) 104.5° (b) 107°  
(c) 109.5° (d) 120°

13. The pH of human blood is —

- (a) 4.5 (b) 5.4  
(c) 6.9 (d) 7.4

14. Which of the following is a measurement of a 4-digit balance?

- (a) 1.024 (b) 10.24  
(c) 22.1202 (d) 2212.02

15. In which of the following, vegetables are to be immersed for preservation?

- (a) Sugar solution  
(b) Salt solution  
(c) Formalin  
(d) Oil

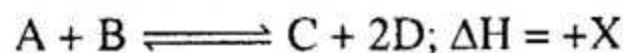
16. ★ The equation for the determination of angular momentum of an electron at 2<sup>nd</sup> energy shell of an atom —

- (a)  $mvr = \frac{2h}{\pi}$  (b)  $mvr = \frac{h}{2\pi}$   
(c)  $mvr = \frac{h}{\pi}$  (d)  $mvr = \frac{4h}{\pi}$

17. Which of the following inert gas is not a p-block element?

- (a) He (b) Ne  
(c) Ar (d) Kr

Observe the stem and answer the questions 18 and 19.



18. Which of the following is the unit of K<sub>c</sub> for the reaction?

- (a) (molL<sup>-1</sup>)<sup>2</sup>  
(b) (mol<sup>-1</sup>L)<sup>2</sup>  
(c) molL<sup>-1</sup>  
(d) (mol<sup>-1</sup>L)<sup>2</sup>

19. What you should do to increase the production of D?

- i. increase the temperature  
ii. decreasing the pressure

iii. C must be removed rapidly from reaction site

Which one is correct?

- (a) i & ii (b) i & iii  
(c) ii & iii (d) i, ii & iii

20. Which one is used to breathe safely in the laboratory?

- (a) safety goggles  
(b) apron  
(c) gloves  
(d) mask

21. Which aqueous solution is used to prepare vinegar?

- (a) vinyl acetate (b) acetic acid  
(c) methanal (d) vinyl chloride

22. ★ What is the ionic product of water at 25°C?

- (a) 7  
(b) 14  
(c) 10<sup>-14</sup>  
(d) 6.023 × 10<sup>23</sup>

23. Which ion shows violet colour in flame test?

- (a) Na<sup>+</sup> (b) K<sup>+</sup>  
(c) Ca<sup>2+</sup> (d) Cu<sup>2+</sup>

Observe the stem and answer to questions 24 and 25.

→Group	15	16	17	18
↓Period				
2 <sup>nd</sup>	L	E	R	Ne
3 <sup>rd</sup>	M	G	Q	Ar

24. How many lone pair electrons are there in G atom of GQ<sub>4</sub>?

- (a) 1 (b) 2  
(c) 4 (d) 6

25. Observe the following information in the light of the stem:

- i. order of ionisation energy L > E  
ii. order of electron affinity Q > R  
iii. MQ<sub>3</sub> forms dimer

Which one is correct?

- (a) i & ii (b) ii & iii  
(c) i & iii (d) i, ii & iii

Ans.	1	(d)	2	(a)	3	(b)	4	(d)	5	(a)	6	(b)	7	(c)	8	(d)	9	(c)	10	(d)	11	(a)	12	(a)	13	(d)
	14	(c)	15	(b)	16	(c)	17	(a)	18	(c)	19	(d)	20	(d)	21	(b)	22	(c)	23	(b)	24	(a)	25	(d)		