KATHMANDU UNIVERSITY
End Semester Examination
August/September, 2017

Mark Scored:

Level : B.E.
Year : II

Course : CHEG 210
Semester : II

Exam Roll No. :

Time: 30 min

F. M. : 20

Registration No.:

Date SEP 10 2017

SECTION "A"

[20 Q ×1 = 20 marks]

Select the most appropriate answer.

1. The first sulphur mining process was invented by
   a) Herman Frasch b) Issac Newton c) Joseph Pristley d) Humphrey Devey

2. The most modern process for production of sulphuric acid is
   a) Lead Chamber Process b) Contact Process
   c) Fuming Sulphuric Acid Process d) None of the above

3. Caustic soda is most cheaply produced by ---------- electrolytic cell process.
   a) Diaphragm Cell b) Membrane Cell c) Mercury Cell d) Hybrid Fuel Cell

4. Soda ash is manufactured by these raw materials
   a) Caustic soda, water and lime
   b) Salt, limestone and coke or natural gas and ammonia
   c) Ammonia, carbon dioxide and sulphuric acid
   d) Caustic soda, ammonia, sulphuric acid

5. In the manufacture of glass, 90% of the raw materials constitute these materials
   a) Sand, hydrochloric acid and gypsum b) Sand, lime and soda ash
   c) Lime, clay and gypsum d) Sand, clay and gypsum

6. The temperature of the melting furnace in the manufacture of glass must be
   a) 450°C b) >1400°C c) 500°C to <1000°C d) > 2000°C

7. The major raw materials in the manufacture of cement are the followings:
   a) Lime, silica and gypsum b) Clay, silica and quartz
   c) Silica, fly ash and gypsum d) Clay, silica and gypsum

8. Which type of cement is used in the manufacture of hydraulic dam?
   a) Type I : Regular Portland Cement
   b) Type III: High Early Strength Cement
   c) Type IV: Low Heat of Hydration Cement
   d) Type II: Moderate Sulfate Resistant Cement

9. In manufacturing of Ordinary Portland Cement (OPC), the following process parameter is required:
   a) Purity of Lime- min. 41%, Temperature of the Kiln: > 1200°C and Pressure: 1 atm
   b) Lime purity – 20 %, Temperature: 1000 °C, Pressure: 5 atm
   c) Clay, Temperature- 2000 °C, Pressure- 10 atm
   d) None of the above

10. Cement gets the maximum strength after crystallization only after
a) 8 hours b) 7 days c) 28 days d) One year

11. A good refractory should exhibit the following properties:
a) Be infusible at operating temperature
b) Should not suffer change in size at operating temperature
c) Should be chemical inert towards chemical reactant and gases
d) All of the above

12. Zirconia based refractory has the following property:
a) Is acid refractory
b) Has the lowest thermal stability
c) Has the ultra-high melting point of 2710°C
d) All of the above

13. CO_2 gas can be absorbed and de-absorbed in the pure form in_____.
a) Boiling water b) Milk of lime
c) Mono-ethanol amine (MEA) solution d) Aqueous potassium permagnate

14. Gaseous sulphur impurities from natural gas or by burning coke can be removed by passing through_____.
a) Zinc solids b) Copper materials
c) FeO d) Aqueous solution of alcohol

15. Oxygen gas is used in_____.
a) Aviator's breathing oxygen
b) Medical purpose in hospital
c) Removing scale from billet in steel industry
d) All of the above

16. In water treatment plant, which chemical is added for disinfection of drinking water?
a) Ferrous sulphate b) Lime c) Bleaching powder d) All of the above

17. In water treatment plant, the coagulation and flocculation process is done by adding the following chemicals in chronology:
a) Lime and aluminum sulphate b) Lime and calcium sulphate
c) Calcium sulphate and hydrochloric acid d) Ethanol and calcium sulphate

18. Which of the following condition best describes the ammonia production process?
a) The process having endothermic reaction, medium temperature reaction
b) The process having highly exothermic reaction, moderate temperature and high pressure
c) Endothermic process with low pressure and low temperature
d) The process is difficult to describe

19. Ammonia production process uses the following catalyst
a) Platinum
b) Zircon
c) Iron with added promoters such as oxides of aluminum and zircon
d) Silver with gold electroplated

20. Safety match is manufactured from
a) Sodium b) Phosphorus c) Potassium d) Selenium

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SECTION "B"
[5Q × 11 = 55 marks]

Attempt *ANY FIVE* questions.

1. Describe in detail the manufacturing process of soda ash (Na_2CO_3) by Solvay Method. Write down the chemical reactions involved in it and also mention its uses with schematic diagram.

   OR

   Write down the manufacture of sulphur by Frasch Process. What are the reactions occurring during the manufacturing of sulphuric acid by Contact Process (reactions only)?

2. What do you know about the industrial manufacturing of glasses? What is the composition of glasses and what are its uses?

3. Write down the nomenclature used as abbreviation in the cement industry (for example: M-MgO). How many types of Portland Cements do you know and where are they used? Describe the manufacturing process of Portland Cement.

4. Mention in detail the process description of manufacturing of dry ice (solid CO_2) by using fuel oil or natural gas as raw material. What are the uses of CO_2 gas?

5. Give description of Kellogg Ammonia manufacturing process.

6. Write down the manufacturing of phosphoric acid (Dry Process). Mention the important applications of phosphorus.