

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– 1<sup>st</sup> / 2<sup>nd</sup> EXAMINATION (NEW SYLLABUS) – SUMMER- 2018

Subject Code: 2110001

Date: 18-05-2018

Subject Name: Chemistry

Time: 2:30 PM to 05:00 PM

Total Marks: 70

Instructions:

1. Question No. 1 is compulsory. Attempt any four out of remaining Six questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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Marks

Q.1. (a)

7

1. Ultraviolet rays are used in water treatment for
  - a) Illumination
  - b) Disinfection
  - c) Coagulation
  - d) Sedimentation
2. High grade steel is manufactured using
  - a) Open hearth furnace
  - b) Bessemer converter
  - c) Electric furnace
  - d) Blast furnace
3. White Portland cement does not contain
  - a)  $\text{SiO}_2$
  - b)  $\text{Al}_2\text{O}_3$
  - c)  $\text{Fe}_2\text{O}_3$
  - d)  $\text{MgO}$
4. A good fuel should possess
  - a) Very high ignition temperature
  - b) Very low ignition temperature
  - c) Moderate ignition temperature
  - d) Moisture content.
5. Which of the following polymers are hard
  - a) Linear
  - b) Branched
  - c) Cross-linked
  - d) Thermoplastic
6. Porosity in the refractory brick generally decreases
  - a) Strength
  - b) Resistance to abreaction
  - c) Resistance to spalling
  - d) All of the above
7. Enzyme Rennin is used in
  - a) Brewing industry
  - b) Dairy industry
  - c) Bio-fuel
  - d) Paper industry

- Q.1. (b) 7
1. Low ionization energy and high electron affinity will favor the formation of ----- bond.
  2. Dissolved CO<sub>2</sub> may be removed from water by addition -----.
  3. The presence of the nitrogen in the organic compound can be detected by ----- test.
  4. Polymerization between styrene and butadiene would lead to the formation of a-----.
  5. The ----- acid is responsible for the ripening of the guava fruit.
  6. ----- is used on tips of drilling and cutting tools.
  7. Chromatography is the technique of ----- chemical compound.
- Q.2.
- a) Write about the 12 principles of the green chemistry. 3
  - b) Write a shot note on the co-ordinate bond. 4
  - c) What is the principle of EDTA titration? How the permanent hardness of water is determined using EDTA method? 7
- Q.3.
- a) What are the three methods of preparation of alloys? 3
  - b) Describe the process for the production of steel from cast iron. 4
  - c) Define corrosion. Explain the protection of iron metal though cathodic and anodic protection. 7
- Q.4.
- a) How tricalcium silicates react with water? Write the chemical equations. 3
  - b) What is the vulcanization of rubber? How does it improve the properties of the natural rubber? 4
  - c) Explain the manufacturing process of lime. Write its properties and significance of lime. 7
- Q.5.
- a) What are the abrasives? Give important uses of abrasives. 3
  - b) What are the thermal insulators? Name three organic and inorganic thermal insulators. 4
  - c) How is ethanol biosynthesized from molasses, starch and cellulosic materials? 7

- Q.6.
- a) Calculate the mass of air needed for complete combustion of 5.0 kg of coal containing 80% carbon, 15% hydrogen and the rest oxygen. 3
  - b) Write the short note on annealing and hardening. 4
  - c) What is the composition of Portland cement? Discuss the manufacturing process of Portland cement. 7
- Q.7.
- a) What is meant by the carbonization? How is carried out in a bee-hive oven? 3
  - b) State two disadvantages of using hard water for domestic and industrial purpose. 4
  - c) Discuss the various methods of controlling corrosion. Explain any one. 7
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