

Total No. of Questions:-4

Class Roll No ... ..

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**BT-101**

**Mid-Semester Examination-II (Jan2024)**

**B.Tech. I Semester (CSE)**

**Engineering Chemistry & Life Science**

**Duration: 1hr 30min**

**Max. Marks: 20**

*Note: Attempt all questions.*

Q1. Describe determination of calorific value of a coal sample by Bomb calorimeter, (construction, procedure, corrections) [CO-3 / 4 Marks]  
**OR**

c) Analyse a coal sample for its Proximate parameters with significance.

d) Apply Dulong's formula to calculate HCV & NCV of a coal sample having C-75%, H-10%, O-8%, S-2% & ash-5% [CO-3 / 2+2 Marks]

Q2. a) Calculate minimum amount of air required for combustion of 5 kg coal having C 80%, H-5%, O-5%, & S-5%..

c) Differentiate between Octane and Cetane no [CO-3 / 2+2 Marks].  
**OR**

a) If a petrol engine is giving a rattling sound analyse the phenomenon and how can you overcome the problem. Explain.

b) 1 gm of coal sample kept at 100°C for 1 hr, residual wt is 0.95 gm, further heat at 950°C for 7 min. the wt was found to be 0.8 gm, & then after 30 min of heating at 750°C residual wt was 0.1 gm. calculate proximate parameter. [CO-3 / 2+2 Marks]

Q3. Describe protein structure with diagram and its denaturation. [CO-4 / 4+2 Marks]  
**Or**

a) Classify carbohydrates with examples

b) Differentiate between DNA and RNA. [CO-4 / 3+3 Marks]

Q4. a) Describe Mendel's law of inheritance

b) Explain universality and degeneracy of genetic code. [CO-5 / 4+2 Marks]

**Or**

b) A desired gene is inserted in a host cell identify the process and explain only mechanism and any 3 applications of the process.

b) Analyse and explain the genetic disorder

i) Extra 21<sup>st</sup> chromosome

ii) One X sex chromosome is missing [CO-5 / 4+2 Marks]