

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Bachelor of Technology (Electronics and Computer Engineering) SEMESTER - 2 Summer 2026 (Regular)

Course :Bachelor of Technology (Electronics and Computer Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 2

Subject Code & Name: 24AFICHEBS202 - ENGINEERING CHEMISTRY

Time : 3 Hours]

[Total Marks : 60

Instructions to the Students:

1. Each question carries 12 marks.
2. Question No. 1 will be compulsory and include objective-type questions.
3. Candidates are required to attempt any four questions from Question No. 2 to Question No.6
4. Use of non-programmable scientific calculators is allowed.
5. Assume suitable data wherever necessary and mention it clearly.

Q1. Objective type questions. (Compulsory Question)

12

- 1 pH of acidic solution is
A) less than 7 B) 7
C) More than 7 D) 13
- 2 The color change in EDTA titration is:
A) Yellow to pink B) Blue to red
C) Green to yellow D) Wine red to blue
- 3 Hardness of water is usually expressed in terms of:
A) NaCl equivalent B) CaCO_3 equivalent
C) H_2SO_4 equivalent D) MgSO_4 equivalent
- 4 Bomb Calorimeter is used to determine the _____ of a fuel.
A) Calorific value B) Volume
C) Temperature D) Density
- 5 Proximate analysis of coal determines:
A) Carbon and hydrogen only B) Moisture, volatile matter, ash and fixed carbon
C) Sulphur only D) Oxygen only
- 6 Surface tension is due to:
A) Gravitational force B) Friction
C) Intermolecular attraction D) Heat energy
- 7 Phenolphthalein is....
A) Strong acid B) Weak base
C) Strong base D) Weak acid
- 8 What is the primary purpose of a Wheatstone Bridge?
A) To measure current B) To measure resistance
C) To measure voltage D) To measure power
- 9 Which of the following is NOT a type of chromatography?
A) Paper chromatography B) Thin-layer chromatography
C) Gas chromatography D) Magnetic chromatography

- 10 Which spectroscopy is called “fingerprint technique” for compounds?
 A) UV spectroscopy B) IR spectroscopy
 C) Flame photometry D) TLC
- 11 Which of the following is a formula of POP?
 A) CaSO_4 B) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 C) $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ D) $\text{CaSO}_4 \cdot 3\text{H}_2\text{O}$
- 12 Which of the following is a constituent of plastic?
 A) Resin B) Plasticizer
 C) Filler D) All of the above

Q2. Solve the following.

- A) Define Hardness. Explain determination of hardness of water by EDTA method. 6
- B) Calculate temporary, permanent and total hardness of sample of water containing following salts in PPM. 6
- | Salts | Amount | Mole wt |
|-----------------------------|--------|---------|
| $\text{Ca}(\text{HCO}_3)_2$ | 10.4 | 162 |
| $\text{Mg}(\text{HCO}_3)_2$ | 12.3 | 146 |
| CaCl_2 | 8.3 | 111 |
| MgSO_4 | 6.2 | 120 |

Q3. Solve the following.

- A) The following observations were noted in Boy’s calorimeter, find the G.C.V. & N.C.V of the gaseous fuel. 6
- Volume of gas burnt = 0.25 m^3 ,
 Weight of water circulated for cooling = 40.5 kg,
 Weight of steam condensed = 0.05 kg,
 Temperature of inlet water = 30.5°C ,
 Temperature of outlet water = 41.6°C
 Latent heat of steam condensed = 580 KCal/Kg
- B) What are fuels? Write its classification. Explain the characteristics of good fuel. 6

Q4. Solve Any Two of the following.

- A) Define electrical conductance. Explain the method of conductance measurement by Wheatstone bridge circuit. 6
- B) What are conductometric titrations? Name four types of acid-base titrations by conductometric method. Explain any one titration. 6
- C) Explain construction, working and applications of $\text{H}_2\text{-O}_2$ fuel cell. 6

Q5. Solve Any Two of the following.

- A) Explain instrumentation and working of double beam UV-VIS spectrophotometer. 6
- B) Describe principle and working of Flame photometry. 6
- C) Explain principle, working and applications of double beam IR spectrophotometer. 6

Q6. Solve Any Two of the following.

- A) Write the Chemical Composition of Portland cement. Write properties and uses of POP. 6

- B) Define polymerizations. Explain addition and condensation polymerization with one example of each. 6
- C) Give the Synthesis, properties and uses of Urea formaldehyde 6

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