

I B. Tech I Semester Supplementary Examinations, May - 2018**APPLIED CHEMISTRY**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

 Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B****PART -A**

1. a) Write the structure of Thiokol. Why it cannot be vulcanized? (2M)
- b) Define cetane number. (2M)
- c) Give a reason why food stuffs cannot be stored in galvanized articles. (2M)
- d) What are fullerenes? How are they prepared? (2M)
- e) Write the applications of junction transistor. (2M)
- f) What is meant by “penstock” in hydropower plant setup? (2M)
- g) What is meant by “OTEC”? (2M)

PART -B

2. a) Discuss fiber reinforced plastics. (7M)
- b) Discuss the role of (i) resins (ii) plasticizers (iii) catalysts as compounding ingredients of plastics with examples. (7M)
3. a) Define HCV and LCV. Calculate the gross and net calorific value of coal containing the following composition: C = 70%, H = 15%, O = 7 %, S = 5 % and remaining ash. Latent heat of steam = 587 cal/gm. (7M)
- b) Write short note on (i) rocket fuels (ii) power alcohol. (7M)
4. a) What is battery? What are its types? Give examples. Discuss the construction and working of Ni-Cd battery. (7M)
- b) Explain galvanic corrosion and differential aeration corrosion. (7M)
5. a) Discuss the laser ablation and CVD method for preparation of carbon nanotubes. (7M)
- b) Write the applications of superconductors. (7M)
6. a) What are semiconductors? Explain the chalcogen photo/semiconductors. (7M)
- b) Discuss about electrical insulator applications. (7M)
7. a) Explain the working of geothermal energy with a neat schematic diagram. (7M)
- b) Discuss the working and advantages of H₂-O₂ fuel cell. (7M)

I B. Tech I Semester Supplementary Examinations, May. - 2018**ENGINEERING CHEMISTRY**

(Com. to CE,ME,CSE,PCE,IT,Chem E,Aero E,AME,Min E,PE,Metal E,Textile Engg)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **THREE** Questions from **Part-B****PART -A**

1. a) Define reverse osmosis. Write its advantages. (3M)
- b) Differentiate electrolytic cell and electrochemical cell. (4M)
- c) Explain the role of purity in corrosion. (3M)
- d) How does the presence of bulky groups on polymer chains affect the properties of polymer? (3M)
- e) What is the reason for the knocking in engines? (4M)
- f) Explain how laser ablation method is used for manufacture of carbon nanotubes. (5M)

PART -B

2. a) Explain ion exchange process for softening of hard water. (8M)
- b) Write the applications of Kohlrausch law. (8M)
3. a) Explain how nature of metal oxide play important role in oxidation corrosion process. (8M)
- b) Explain stereoregular polymers and their significance. (8M)
4. a) Write the advantages and disadvantages of gaseous fuels. (8M)
- b) Write the engineering applications of biodegradable polymers and conducting polymers. (8M)
5. a) Explain the working of photovoltaic cell and solar reflectors. (8M)
- b) Explain tinning and electroless plating. (8M)
6. a) Explain the working of H₂-O₂ fuel cell and its applications. (8M)
- b) Explain ultimate analysis of coal. (8M)
7. a) Discuss the properties, preparation and applications of PVC and Styrene Butadiene Rubber. (8M)
- b) What is potable water? How can the water purified by sterilization and disinfection process? (8M)



I B. Tech I Semester Supplementary Examinations, Nov/Dec. - 2017**MATHEMATICS-II (MM)**

(Com. to ECE, EEE, EIE, Bio-Tech, E Com E, Agri E)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Find four approximation of $x = x^4 - 10$ using Iteration method. (4M)
- b) Prove that $\mu\delta = \frac{1}{2}\Delta E^{-1} + \frac{1}{2}\Delta$ (3M)
- c) By Euler's method find $y(0.2)$, $y(0.4)$ given that $\frac{dy}{dx} = \cos xy$, $y(0) = 1$ (4M)
- d) Find a_0, a_n for $f(x) = \frac{x}{2}$ in $[0, 2\pi]$. (4M)
- e) State and prove linear property in Fourier transform. (4M)
- f) Find $Z(a^n)$. (3M)

PART -B

2. a) Find the four approximations of $xe^x = 1$ by Bisection method. (8M)
- b) Find the four approximations of $x \log_{10} x = 2$ by False position method. (8M)
3. a) Fit a cubic polynomial for the following data. (8M)
 $y_0 = -5, y_1 = -1, y_2 = 9, y_3 = 25, y_4 = 55, y_5 = 105$
- b) Find the $y(4)$ for the following data. (8M)

x	0	2	3	6
y	707	819	866	966

4. a) Evaluate $y(0.1)$, $y(0.2)$ & $y(0.3)$ using Taylor's Series method given that (8M)
 $y' = y^2 + x^2$, $y(0) = 1$.
- b) By modified Euler's formula find $y(0.2)$, $y(0.4)$ given that $\frac{dy}{dx} = 2xy^2$, $y(0) = 1$ (8M)

5. a) Expand $f(x) = x \sin x$ $0 < x < \pi$ as half range sine series. (8M)
- b) Find the Fourier Series of $f(x) = |\sin x|$ $-\pi \leq x \leq \pi$ (8M)
6. a) Find the Fourier cosine transform of $\frac{1}{\sqrt{x}}$ (8M)
- b) Find the Fourier transform of $e^{-\frac{x^2}{2}}$. (8M)
7. a) Prove that If $Z[f(n)] = F(z)$, then $\lim_{z \rightarrow \infty} z F(z) = f(0)$. (8M)
- b) Solve the difference equation $y_{n+2} - 5y_{n+1} + 6y_n = 3n + 5$, $y_0 = 1, y_1 = 3$ using Z-Transforms. (8M)