

ROLL Number.....  
Paper Code –BE1011811

RKDF University  
Subject Code –BE-101

BE (Common For All Branch) - I<sup>st</sup> Year  
Exam – Dec -2017  
Paper Title- Engineering chemistry

Max Time: 3 Hrs.

Max Marks: 70

SECTION - "A"

Q.1 Objective type questions.

10x1 = 10

- (1) The unit of hardness is -  
(a) Clark's (b) French  
(c) ppm (d) All of them
- (2) Which of the following causes temporary hardness -  
(a)  $CaCO_3$  (b)  $MgSO_4$   
(c)  $KCl$  (d)  $Fe_2O_3$
- (3) The zeolite is-  
(a)  $Na_2Al_2Si_2O_8H_2O$  (b)  $Al_2Si_2O_8H_2O$   
(c)  $Al_2Si_2O_8$  (d) None of these
- (4) Raw material for the manufacture of cement are:  
(a) Lime stone + Clay + Gypsum (b) Lime stone + Sand + Gypsum  
(c) Alumina + Sand + Gypsum (d) None of these
- (5) Good lubricant should have high:  
(a) Acidly (b) Oiliness  
(c) Volatility (d) All of them
- (6) A good fuel should have -  
(a) High calorific value (b) Low ash content  
(c) Low cost (d) All the above
- (7) The Uv- visible region lies between-  
(a) 200 – 800 nm (b) 100 – 600 nm  
(c) 500 – 800 nm (d) None of these
- (8) Identification of functional group in a compound can be established by using-  
(a) U.V. spectroscopy (b) I.R. spectroscopy  
(c) N.M.R. (d) Mass spectroscopy
- (9) Raw materials used for the manufacture of polyester are -  
(a) Urea – formaldehyde (b) Poly glycols  
(c) Glycol + Terephthalic acid (d) All
- (10) Bakelite is obtained by the-  
(a) Addition polymerization (b) Co-polymerization  
(c) Condensation - polymerization (d) None of these

**Section - "B"**  
**Short Answer Type Questions**

**5X5 =25**

- (1) What are boiler scales? What are ill effects of scales?

**Or**

Describe Permutit process for softening of hard water give equation.

- (2) Define lubricants and mention the chief function of lubricants.

**Or**

Discuss the following properties of lubricants (Any two)-

- (a) Aniline point                      (b) SEN                      (c) Viscosity Index

- (3) What is calorific value? Differentiate between H.C.V. and L.V.C.

**Or**

Describe the carbonization process.

- (4) Discuss various application of UV spectroscopy.

**Or**

What is chromatography? How many types mention its merits and demerits?

- (5) Write classification of polymer?

**Or**

Discuss preparation, properties and uses of –

- 1- Polyethylene 2- Polystyrene

**Section - "C"**  
**Long Answer Type Questions**

**5x7=35**

- (1) What do you understand by hard and soft water? How many types of hardness are there in water? Give the action of hard water on soap. Explain why hard water is unfit for washing and industrial purpose.

**Or**

Explain scale and sludge formation. Write disadvantage of scale and sludge formation.

- (2) Discuss the manufacture of Portland cement? Draw labeled diagram and write chemical reaction involved in it?

**Or**

Write short note on (Any three)-

- (a) Cloud point and pour point                      (b) Flash point and fire point  
(c) Viscosity and viscosity index                      (d) Steam emulsification number  
(e) Iodine value

- (3) Calculate the gross and net calorific value of coal having the following compositions-  
 $C = 85\%$ ,  $H = 8\%$ ,  $S = 1\%$ ,  $N = 2\%$ ,  $ash = 4\%$  Content heat of steam = 857 cal/gm

**Or**

What is proximate analysis? What is the significance of the various determinants?

- (4) Define and derive Beer-Lambert's law discuss its applications and limitations.

**Or**

Describe Infrared spectroscopy with an illustrative diagram what are its applications.

- (5) Write short note on (Any three)

- (a) Bakelite                      (b) PVC                      (c) Rf value                      (d) Teflon

**Or**

- (a) Differentiate between thermoplastic and thermosetting materials.  
(b) Give the Characteristics of Municipal water.