SEAT No._____ No. of Printed pages : 03

[583/A-38]

SARDAR PATEL UNIVERSITY

B.Sc. Examination (Fourth Semester)
Tuesday, 11th April 2017.
02:00 p.m. to 05.00 p.m.
US04CCHE02(Applied Chemistry)

Note : (i) All questions are to be attempted. (ii) Figures to the right indicate marks. **Total Marks : 70**

Q.1 Choose the correct option for the following : **[10]**

1. The – OH group of _____ is absorbs at 3200 – 3600 cm^{-1} in the I.R. region.
   (a) Phenol (b) Alcohol
   (c) Carboxylic acid (d) All of these
2. _____ is used as a solvent in the U.V visible spectroscopy.
   (a) 1, 3 – Dioxane (b) 95 % propanol
   (c) 95 % Ethanol (d) Cyclohexene
3. Which of the following group is a independent chromophore ?
   (a) Nitro (b) Acetamido
   (c) Ethylenic (d) Methoxy
4. Which of the following is a vitamer of vitamin A ?
   (a) α – Tocopherol (b) Ergosterol
   (c) Ascorbic acid (d) Retinol
5. Vitamin E is described as "_____."
   (a) Sun – shine vitamin (b) most controversial vitamin
   (c) vitamin in search of diseases (d) co-enzyme in collagen formation.
6. Beri-beri disease caused by deficiency of _____.
   (a) Vitamin B_9 (b) Vitamin B_{12}
   (c) Vitamin B_7 (d) Vitamin B_1
7. _____ elements are considered as primary nutrients.
   (a) N, P & K (b) Zn, B & Cu
   (c) Ca, Mg & S (d) Mn, Mo & Cl
8. A deficiency of _____ decrease the plant growth accompanied by extensive yellowing of green plants.
   (a) Carbon (b) Sulphur
   (c) Nitrogen (d) Phosphorus.
9. Which of the following Portland cement is sulphate resisting cement ?
   (a) Modified Portland cement (b) Regular Portland cement
   (c) Low heat Portland cement (d) High early strength Portland cement
10. The chemical formula of Gypsum is _____ .
    (a) $CaSO_4.H_2O$ (b) $CaSO_4.6H_2O$
    (c) $CaSO_4.2H_2O$ (d) $CaSO_4.5H_2O$

Q.2 Answer the following : [ANY TEN] **[20]**

1. Define the term : Blue shift and Red shift.
2. Explain. Methylalcohol is a good sovent for U.V. determination but not for a IR determination.
3. Classify the following groups into chrompohore and auxochrome.
   - N = O, - NH_2, - Cl, - N=N-, -OH, >C=S, >C=O, - $COCH_3$

4. How vitamin D_2 is synthesized from Ergosterol ?
5. Which vitamin is responsible for formation of Bitot's spots in eyes and how it is developed in the eyes ?
6. Write the structure and systematic name of α – Tocopherol and δ - Tocopherol.
7. Explain. Urea act as a fertilizer.
8. Give the chief requisites of a fertilizer.
9. Describe the importance of fertilizer.
10. Give the list of various types of Gypsum.
11. Give the structure and name of minerals which are consist with Portland cement clinker.
12. Explain the term "White Cement."

Q.3 Attempt the following.

[a] Using Woodward – Fieser rule and calculate the λmax for the following molecules. **[06]**
(i) Carvone (ii) Vitamin A_1 (iii) 2,4 - Hexadiene

[b] Discuss the various types of transitions occurs in ultraviolet region and arrange them in order of decreasing energy. **[04]**

OR

Q.3 Attempt the following.

[a] What is vibrational spectra ? Describe important types of fundamental vibrations. **[06]**

[b] Discuss the analytical uses of IR spectroscopy. **[04]**

Q.4 What are vitamins ? Give the classification of vitamins in detail. Also write the biosynthesis of 1, 25 – Dihydroxycholecalciferol from 7 – Dehydrocholesterol. **[10]**

OR

Q.4 Write the biochemical functions of vitamin E. Also give the dietary sources of vitamin E. **[10]**

Q.5 Attempt the following.

[a] Discuss the manufacturing process of $CaCN_2$. Also discuss the action of $CaCN_2$ as a fertilizer. **[06]**

[b] Give an account of mixed fertilizer. **[04]**

OR

Q.5 Attempt the following.

[a] Define "Nitrogenous fertilizer." Discuss the manufacturing process of ammoniumnitrate. **[06]**

[b] Give the preparation method of mono amoniumphosphate and diammoniumphosphate. **[04]**

Q.6 Attempt the following.

[a] Explain the term "Cement". Also Discuss the properties of cement. **[06]**

[b] Write a short – note on : Plaster of Paris. **[04]**

OR

Q.6 Attempt the following.

[a] Discuss the manufacturing process of Lime. Also write the uses of Lime. **[06]**

[b] Write a short note on : Coloured Cement **[04]**

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GIVEN DATA FOR EXAMPLES

Absorption Values :

	(λ_{max}) nm
(A) α,β – Unsaturated ketone :	
a) Basic system of parent system	215 nm
b) Increment for C- Substituent of α – carbon	10 nm
c) Increment for C- Substituent of β – carbon	12 nm
d) Increment for C- Substituent of γ – carbon	18 nm
e) Increment for exocyclic double bond	05 nm
(B) Basic value α,β –Unsaturated aldehyde	207 nm
a. Increment for β – carbon substituent	12 nm
b. Increment for γ – carbon substituent	18 nm
(C)	
a. Parent acyclic diene with conjugation	217 nm
b. Ring residue	05 nm
(D) Polyene	
a. Basic value of heteroannular / acyclic diene	214 nm
b. Basic value of hetero annular diene	253 nm
c. Increment for each C- Substituent	05 nm
(D) Parent values	
a. Acyclic conjugated diene and hetertoannular conjugated diene	215 nm
b. Homoannular conjugated diene	253 nm
c. Acyclic triene	245 nm
(E) Increments	
a. Each alkyl substituent or ring residue	05 nm
b. Exocyclic double bond	05 nm
c. Double bond extending conjugation	30 nm

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