



KQ-2141-42-43 Seat No. _____

M. Sc. (Sem. III) Examination

November / December - 2017

1. CHN-603-(O) : Organic Chemistry
2. CHN-603 : Inorganic Chemistry (Corrosion)
3. CHN-603(I) : Inorganic Chemistry - III
(Coordination Chemistry)

Time : 3 Hours |

{ Marks : 70 }

I. CHN-603-(O) : Organic Chemistry

Instruction : All questions are compulsory and carry equal marks.

1 Answer any two of the following :

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- (i) Define a drug according to WHO. Give the requirements for ideal drugs. Discuss the Classification of drugs on the basis of their therapeutic actions.
- (ii) Write short note on
 - (1) Diagnostic agents
 - (2) Drug design through conjugation
- (iii) Explain the relationship between chemical constitution and physiological activity. How are I.T. useful for this study ?
- (iv) Explain the use of modern instrumental methods based upon chromatographic techniques in pharmaceutical chemistry.

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Answer any two of the following :

- (i) Explain the constitution of penicillin by the use of infrared spectra. Give synthesis of penicillin from penicillamine.
- (ii) What is the general structure of tetracycline ?
Synthesize any two tetracycline antibiotics
- (iii) Discuss the structure of N-methyl-D-glucosamine in streptomycin.
- (iv) Discuss the production, isolation, properties, uses and mechanism of action of
 - (i) Actinomycins
 - (ii) polyenes

3 Answer any two of the following :

- (i) Give synthesis and uses of sulfathiadiazole and sulfa guanidine
- (ii) Define and classify sulphonamides. How will you synthesize and explain use of sulphaacetamide ?
- (iii) Write synthesis of sulpha drugs and explain mechanism :
 - (i) Sulphanylamide
 - (ii) Trimethoprim

4 Answer any two of the following :

- (i) What are anticholinergic drugs ? Classify them. Give synthesis any two antispasmodic drugs.

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- (ii) Mention any three physiological responses of histamine. Write synthesis and uses of benadryl.
- (iii) Differentiate between general and local anaesthetics. Explain the ideal anaesthetic with reference to ester and amide groups.
- (iv) What is cholinergic nervous system ? Give synthesis and uses of neostigmine.

Answer any seven of the following

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- (i) What is the full form of CADD and QSAR.
- (ii) Give synthesis of sulphalene.
- (iii) Define Emulsifying agents.
- (iv) What are antibiotic drugs ?
- (v) Give uses of penicillin.
- (vi) What is blocking agent ?
- (vii) Give synthesis of any one sulpha drug.
- (viii) What is Local anaesthetics ? What is its action ?
- (ix) Distinguish between "drug" and "medicine".
- (x) What is antihistamine ? What is its role in human body ?

2. CHN-603 : Inorganic Chemistry (Corrosion)

1 Answer any two

- (a) Discuss the factors that encourage the intergranular corrosion and write the step to decrease this corrosion.
- (b) What is Pourbaix diagrams ? Explain their utility and limitations.
- (c) Write short note on Differential aeration current.

2 Answer any two

- (a) Discuss the application of passivators.
- (b) What is Polarized Cell ? Discuss the influence of polarization on the corrosion rate in the acidic solution with example.
- (c) Discuss the corrosion of Nickel in atmosphere.

3 Answer any two

- (a) Explain Wagner theory of oxidation.
- (b) Write short note on Underground corrosion and its prevention.
- (c) Write short note on "Corrosion Fatigue".

Answer any two :

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- (a) Write a short note on Hydrogen Cracking
- (b) Discuss the factor affecting on the corrosion of Iron and Steel.
- (c) Write short note on "Paints"

Answer any two :

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- (a) Explain the Sheradizing Process
- (b) Write a short note on "Uniform attack"
- (c) Discuss the classification of coating for corrosion resistance.

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3. CHY-603(I) : Inorganic Chemistry - III
(Coordination Chemistry)

1 Answer any two questions from the following

- (a) For $m = m'$, prove that integral $\int_{-\pi}^{\pi} e^{-m \cos \theta} d\theta = \frac{1}{4} \pi e^{-m}$

- (b) Evaluate the integral $\int_0^{\pi} \theta_2^1 \theta_4^0 \theta_2^1 \sin^n d\theta$.

Given :

$$\theta_2^1 = \sqrt{\frac{15}{4}} \sin \theta \cos \theta, \theta_4^0 = \sqrt{\frac{9}{128}} (35 \cos^4 \theta - 30 \cos^2 \theta)$$

- (c) Starting from the Secular determinant, prove that the values of energy for e_g and t_{2g} are $+6 Dq$ and $-4 Dq$ respectively.

2 Answer any two questions from the following

- (a) Derive the equation $\chi(n) = \frac{\sin\left(l + \frac{1}{2}\right)n}{\sin\frac{n}{2}}$ and

find out the value of $\chi(C_2)$ and $\chi(C_3)$

- (b) Prove that $(\pm 3)\mu_0(\pm 3) = -3\lambda_q$

- (c) Find out the commutator value of $[L_i, L_j]$

1 Answer any two questions from the following : 14

- (a) For $B = 2 Dq$, prove that

$$\psi_3 = \frac{1}{\sqrt{24}} \left[3 < 3 > + \sqrt{3} < -1 > \right]$$

- (b) Find out the value of $\langle 0 | \psi_0 \rangle \langle 0 |$

- (c) Prove that $\langle 3, -2 \rangle = \Phi_+ \Phi_0$

Answer any two questions from the following : 14

- (a) Discuss vibronic coupling spectra for iron complexes.

- (b) Discuss vibronic coupling spectra for VO(IV) complexes.

- (c) Discuss the selection rule.

Answer any seven questions from the following : 14

- (1) What is the Legendre Polynomial value of

$$P_1(\cos \theta)$$

- (2) What are the values of l and n for 3d orbital?

- (3) How inter electronic repulsion term is written in the mathematical way?

- (4) Write the values of ladder operators?

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(5) What is the value of δv in polar coordinates?

(6) Which factors affect the stability of ~~met~~ complexes?

(7) Define vibronic coupling.

(8) Which type of separation of d-orbitals will there in strong and weak field?

(9) Explain the term A_{2g} in terms of Mulliken symbol.

(10) Define RS coupling.