

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

**M.Sc. Chemistry** Degree (Semester) Examinations, November 2019 Part – III : Core Subject : First Semester : Paper – I

#### ORGANIC CHEMISTRY – I

Under CBCS – Credit 4

Time: 3 HoursMax. Marks: 75

# $\underline{SECTION} - \underline{A}$

Answer ALL (	$(5 \times 1 = 5)$				
1. Pick out correct guest molecule for crown ether in the following					
a) H <sup>+</sup>	b) Na <sup>+</sup>	c) both a&b	d)He <sup>+</sup>		
2. Which of the following is not a source of carbine?					
a) CH <sub>2</sub> N <sub>2</sub>	b) CH <sub>2</sub> =C=O	c) CHCl <sub>3</sub> /KOH	d) CH <sub>2</sub> I/Zn		
3. Which of the	following compound	d is not aromatic?			
a) cyclobutane		b) cyclopentadienyl anion			
c) cyclopropenium ion		d) azulene			
4. Allenes show optical activity because of the presence of					
a) chiral carbon atom		b) conjugate double bond			
c) isolated double bond		d) cumulated double bond			
5. Which one is true based on Haworth's Methylation Method of					
aldohexose					
a) All the -C	H get methylated				
b) only C2-	carbon's –OH get me	ethylated			
c) Anomeric	carbon's –OH get m	nethylated			
d) Only glyceraldehydes –OH get methylated					

# **SECTION – B**

#### **Answer any FIVE Questions :**

 $(5 \times 2 = 10)$ 

 $(5 \times 6 = 30)$ 

(1+2+2)

(3+2)

6. What is resonance energy?

- 7. Name one compound, which can be used for free radical generation.
- 8. What is Homoaromaticity?
- 9. What are alternant and non alternant hydrocarbons?
- 10. When a sulphone can be expected to be chiral?
- 11. Write the structure of zingiberene.
- 12. What are the components of starch?

#### <u>SECTION – C</u>

#### **Answer ALL Questions :**

13.a) Write a short note on i) Hydrogen bonding ii) Hyper conjugation (**OR**)

b) Explain the following

i) Methyl aniline is stronger base than aniline.

- ii) Benzoic acid is a weaker acid than para nitro benzoic acid.
- iii) Rule of resonance.

14.a) Give general methods for the formation of a carbenes.

#### $(\mathbf{OR})$

b) Explain kinetic method for determining organic reaction.

15.a) Explain the terms

i) Huckel's rule

(**OR**)

ii) antiaromatic

b) Explain the aromaticity of [14] annulene.

16.a) What are stereoselective and stereospecific reaction ?



17.a) Write any one method of determining ring size of the sugar ring.

(**OR**)

(1+1+2+1)

Sucrose, lactose, morphine, maltose

b) Write the structure of the following

#### **SECTION – D**

 $(3 \times 10 = 30)$ 

- 18. Write a short note on i) Inclusion compounds. ii) EDA complex.
- 19. Discuss the uses of the following in the determination of organic i) Identification of product

reaction mechanism

**Answer any THREE Questions :** 

ii) Identification of intermediate

20. a) Classify the following as aromatic, antiaromatic and non aromatic compound and justify.



b) Explain the aromaticity of [18] annulene.

(5)

- 21. Explain the following with suitable example . (2+2+2+4)
  - i) Craig's rule
  - ii) Enantiotopic atoms and diasteriotopic atoms
  - iii) Enantiomer
  - iv) What is asymmetric synthesis? Explain giving examples.

22. Explain the structural elucidation of quinine.



(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

M.Sc. Chemistry Degree (Semester) Examinations, November 2019 Part – III : Core Subject : First Semester : Paper – II

#### **INORGANIC CHEMISTRY – I**

Under CBCS – Credit 4

Time: 3 HoursMax. Marks: 75

# <u>SECTION – A</u>

#### <u>Answer ALL Questions</u> :

 $(5 \times 1 = 5)$ 

- 1. Na<sub>2</sub>S crystallizes with an antifluorite structure. Which statement is true about this structure?
  - a) The coordination number of each  $S^{2-}$  centre is 8
  - b) Each Na<sup>+</sup> ion is within a cubic arrangement of  $S^{2-}$  ions
  - c) The structure is based on an CaF<sub>2</sub> structure, with Na<sup>+</sup> ions in Na<sub>2</sub>S occupying the same sites as Ca<sup>2+</sup> ions in CaF<sub>2</sub>
  - d) The  $S^{2-}$  ion is tetrahedrally sited
- 2. The geometry of IF<sub>7</sub> is

a) T-shaped

- b) Trigonal bipyramidal
- c) pentagonal bipyramidal d) see-saw
- 3. Which one of the following is hard base?
  - a)  $Cu^+$  b)  $SH^-$  c)  $OH^-$  d)  $CN^-$
- 4. The ability of a material to exist in more than one crystal structure is

known as \_\_\_\_\_

- a) Polymorphism b) Allotropy
- c) Polyhedral phase d) Lattice

- 5. Atom A possesses higher values of packing fraction than atom B. the relative stabilities of A and B are
  - a) B is more stable than A
  - b) A is more stable than B
  - c) A and B both are equally stable
  - d) Stability does not depend on packing fraction

#### <u>SECTION – B</u>

#### **Answer any FIVE Questions :**

- 6. State Slater's rule.
- 7. Why is Na<sup>+</sup> ion smaller than Na atom?
- 8. What is Bent's rule?
- 9. What is symbiosis?
- 10. How is tetrasulphur tetranitride obtained?
- 11. Why is uranium enriched for use in nuclear reactors?
- 12. Neutron is a better projectile for carrying out nuclear reaction Why?

#### <u>SECTION – C</u>

#### **Answer ALL Questions :**

 $(5 \times 6 = 30)$ 

 $(5 \times 2 = 10)$ 

13.a) Write the factors affecting the formation of ionic compounds.

#### (OR)

- b) How is ionic radius calculated by Pauling's method?
- 14.a) Give the shapes of  $XeF_2$  and  $ClF_3$  based on VSEPR theory.

#### (**OR**)

b) Draw the MO diagram of NO and calculate the bond order.

15.a) Discuss Bronsted - Lowry and Lux-Flood acid base concept.

#### (OR)

- b) Write the reactions of liq. SO<sub>2</sub> as solvent.
- 16.a) Outline the synthesis, structure and bonding in isopolyanions of phosphorus.

#### (OR)

- b) Give the classification of carbides and its uses.
- 17.a) What is nuclear fusion? Describe the principle behind the release of stellar energy.

### (**OR**)

- b) Write notes on 1) radioactive equilibrium
  - 2) radioactive disintegration

#### <u>SECTION – D</u>

**Answer any THREE Questions :** 

 $(3 \times 10 = 30)$ 

- 18. What is Lattice energy? Describe how lattice energy of ionic crystals evaluated by Born Haber cycle.
- 19. i) What are intermolecular forces? How do these forces originate?ii) Explain the different types of intermolecular forces.
- 20. Explain HSAB principle. Discuss its applications.
- 21. What are boranes? Explain the preparation, properties, structure and bonding in boranes.
- 22. i) What is the difference between a cyclotron and synchroton?
  - ii) Explain the principle of working of a cyclotron.

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

**M.Sc. Chemistry** Degree (Semester) Examinations, November 2019 Part – III : Core Subject : First Semester : Paper – III

#### PHYSICAL CHEMISTRY – I Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: 75

# <u>SECTION – A</u>

**Answer ALL Questions :** 

 $(5 \times 1 = 5)$ 

 $(5 \times 2 = 10)$ 

- 1. The commutator of x and  $P_y$  is
  - a) 1 b) 0 c)  $\infty$  d)  $-\infty$
- 2. The zero-point energy of a particle in 1-D box of dimension 6 A is a)  $10^{-22}$ J b)  $10^{-2}$ J c)  $16.22*10^{-20}$ J d)  $10^{2}$
- 3. The unit of fugacity is
  - a) Same unit as pressureb) Same unit as temperaturec) Same unit as massd) Same unit as volume
- 4. In Langmuir adsorption isotherm, the adsorption co-efficient is
  - a)  $K_a \ge K_d$  b)  $K_a \ge K_d^{-1}$  c)  $K_a = K_d$  d)  $K_d / K_a$
- 5. For one mole of a gas, the ideal gas equation is
  - a) PV=RT b) PV=1/2RT c) PV=3/2 RT d) PV=5/2RT

# <u>SECTION – B</u>

# **Answer any FIVE Questions :**

- 6. Illustrate Heisenberg's Uncertainty principle.
- 7. Define Eigen value and Eigen function.
- 8. Mention the shapes of 1S and 2S orbitals.
- 9. Mention thermodynamic equation of state.
- 10. What is meant by steady state approximation?
- 11. Write a note on "Liquid Crystals".
- 12. Define Mean free path.

# <u>SECTION – C</u>

### Answer ALL Questions :

 $(5 \times 6 = 30)$ 

13.a) Derive De-Broglie's wave equation.

(**OR**)

b) Deduce Schmidt orthogonalisation.

14.a) Illustrate particle moving in 1-D box.

### (OR)

b) Determine particle moving in 3D-cubic box.

15.a) Derive Gibbs-Duhem equation.

# (**OR**)

b) Discuss thermodynamic properties of real gases.

16.a) Compare ARRT and collision theory.

# (**OR**)

b) Discuss Lindeman's theory of unimolecular reactions.

17.a) Discuss the Maxwell distribution of molecular velocitiess.

# (OR)

b) Discuss the structure of liquids by X-ray method.

# <u>SECTION – D</u>

# **Answer any THREE Questions :**

18. Write note on the following

i) Hermitian operator

ii) Linear operator

iii) Non-Linear operator

19. Discuss hydrogen atom problem.

20. Deduce Onsager reciprocal relationship.

- 21. Derive thermodynamic treatment of absolute reaction rate theory.
- 22. Explain Maxwell-Boltzmann distribution law.

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 $(3 \times 10 = 30)$ 

operator



(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

**M.Sc. Chemistry** Degree (Semester) Examinations, November 2019 Part – III : Core Subject : Third Semester : Paper – I

#### **ORGANIC CHEMISTRY – III**

Under CBCS – Credit 4

Time: 3 HoursMax. Marks: 75

# <u>SECTION – A</u>

### **Answer ALL Questions :**

 $(5 \times 1 = 5)$ 

1. Why is the oxygen-hydrogen absorption of CH<sub>3</sub>OH such a broad band in the infrared?

a) rotational energy levels broaden the absorption

- b) hyperconjugation resonance broadens the absorption
- c) hyperconjugation resonance broadens the absorption
- d) hydrogen bonding broadens the absorption
- 2. Which of the following statements regarding NMR spectroscopy is wrong?
  - a) NMR signals towards the left of the spectral chart correspond to larger chemical shifts
  - b) Chemical shifts are larger when the frequencies of the radiation which induces the nuclear transitions are higher
  - c) Chemical shifts are larger when shielding effects are greater
  - d) A hydrogen signal splits into *n*+1 peaks by spin-spin coupling when the number of equivalent hydrogen atoms on adjacent atom(s) is *n*, and no other neighbouring atoms are involved

3. In the mass spectrum of ethyl propanoate, a typical peak would be expected from a Mc Lafferty rearrangement is at \_\_\_\_\_

a) 29 b) 74 c) 45 d) 87

- 4. In sigmatropic rearrangement reactions, for systems having 4q electrons in photochemical conditions will undergo \_\_\_\_\_\_.
  a) conrotation b) suprafacial c) disrotation d) antarafacial
- 5. The photochemical [2+2] cycloaddition of carbonyl compound with alkene to give \_\_\_\_\_

a) Oxetene b) Oxetane c) oxetyne d) dimer

# <u>SECTION – B</u>

<u>Answer any FIVE Questions</u> :  $(5 \times 2 = 10)$ 

- 6. Arrange the following in the increasing order of their UV absorption
  - maxima i) Anthracene ii) Ethylene
    - iii) Naphthalene iv) Butadiene
- 7. Give approximate position of the characteristic IR bands in the

following i) CH<sub>3</sub>COCH<sub>3</sub> ii) CH<sub>3</sub>CH<sub>2</sub>OH

- 8. What is coupling constant?
- 9. State nitrogen rule.
- 10. What is shift reagent?
- 11. Write Woodward –Hoffmann rule.
- 12. Define photosensitization.

# **SECTION – C**

**Answer ALL Questions :** 

 $(5 \times 6 = 30)$ 

- 13.a) Explain different types of electronic transition with suitable examples. **(OR)** 
  - b) Using IR spectroscopy show how you could distinguish between inter and intra hydrogen bonding.
- 14.a) i) Discuss about first order and non-first order spectra.ii) Explain coupling constant using Karplus equation.

#### (OR)

b) Explain NOSEY with examples.

15.a) Write short note on i) Isotopic peak

ii) Retro Diels-Alder rearrangement

#### (**OR**)

- b) Explain Mass spectrum of ethylamine, cyclohexnol and Aniline.
- 16.a) Narrate electrocyclic conversion of 1, 3, 5 trienes to cyclo– hexadinene using FMO approach.

#### (OR)

- b) Describe the correlation diagram approach of cyclobutene to1, 3 butadiene.
- 17.a) Write short note on Norrish type II reaction.

#### (**OR**)

b) Explain Barton reaction.

#### <u>SECTION – D</u>

#### **Answer any THREE Questions :**

 $(3 \times 10 = 30)$ 

18. i) Calculate the  $\lambda$  max value of the following compounds. (5 + 2 + 3)





(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

**M.Sc. Chemistry** Degree (Semester) Examinations, November 2019 Part – III : Core Subject : Third Semester : Paper – II

#### **INORGANIC CHEMISTRY – III**

Under CBCS – Credit 4 Time: **3** Hours Max. Marks: **75** 

# <u>SECTION – A</u>

#### **Answer ALL Questions :**

 $(5 \times 1 = 5)$ 

 The correct combination of metal, number of carbonyl ligands and the charge for a metal carbonyl complex [M(CO)<sub>x</sub>]<sup>z-</sup> that satisfies the 18 electron rule is

a) M=Ti, x=6, z=1	b) M=V, x=6, z=1
c) M=Co, x=4, z=2	d) M=Mo, x=5, z=1

- 2. The order of CO bond strength in the following metal hexacarbonyls is likely to be
  - a)  $[V(CO)_6]^- < [Cr(CO)_6] < [Mn(CO)_6]^+$
  - b)  $[Cr(CO)_6] < [Mn(CO)_6]^+ < [V(CO)_6]^-$
  - c)  $[Mn(CO)_6]^+ < [Cr(CO)_6] < [V(CO)_6]^-$
  - d)  $[V(CO)_6]^- < [Mn(CO)_6]^+ < [Cr(CO)_6]$
- 3. The oxidative addition and reductive elimination steps are favoured by a) electron rich metal centres
  - b) electron deficient metal centres
  - c) electron deficient metal centres and electron rich metal centres
  - d) electron rich metal centres and electron deficient metal centres

- 4. In metal –olefin interaction the extent of increase in metal \_\_\_\_\_\_ olefin  $\pi$ -back donation would
  - a) lead to decrease in C=C bond length
  - b) change the formal oxidation state of the metal
  - c) change the hybridization of the olefin from  $sp^2$  to  $sp^3$
  - d) increase with the presence of electron donating substituents on the olefin
- 5. In Ziegler-Natta catalysis the commonly used catalyst system is
  - a) TiCl<sub>4</sub>. Al(C<sub>2</sub>H<sub>5</sub>)<sub>3</sub> c) VO(acac)<sub>2</sub>, Al<sub>2</sub>(CH<sub>3</sub>)<sub>6</sub> b) ( $\eta^{5}$ -Cp)<sub>2</sub>TiCl<sub>2</sub>, Al(OC<sub>2</sub>H<sub>5</sub>)<sub>3</sub> d) TiCl<sub>4</sub>, BF<sub>3</sub>

# <u>SECTION – B</u>

# **Answer any FIVE Questions :**

- 6. Calculate the EAN for  $[Cu(NH_3)_6]^{2+}$  and  $[PtF_6]^{2-}$ .
- 7. What is Synergistic bonding?
- 8. Write the preparation of dicobalt ocracarbonyl.
- 9. Illustrate beta -H Elimination.
- 10. What is Tebbe's reagent?
- 11. Which Fischer Carbene is more stable singlet or triplet? Why?
- 12. Summarize the advantages of heterogenous catalyst.

# $\underline{SECTION-C}$

# **Answer ALL Questions :**

 $(5 \times 6 = 30)$ 

 $(5 \times 2 = 10)$ 

13.a) Write note on metal carbonyl clusters.

#### (**OR**)

b) Illustrate capping rule.

14.a) Illustrate with examples the classification of metal carbonyls.

# (OR)

- b) Give the preparation, properties and structure of Nickel tetra carbonyl.
- 15.a) Discuss the reductive elimination reactions and its salient features.

# (OR)

b) Explain migratory insertion reaction and its mechanism.

16.a) Compare Fischer carbene and Schrock carbene.

# (OR)

- b) Discuss the structure and bonding of ferrocene.
- 17.a) What is Wacker process? Discuss its mechanism.

# (**OR**)

 b) What is meant by heterogenous catalyst? Explain the importance of Ziegler- Natta catalyst.

# <u>SECTION – D</u>

# **Answer any THREE Questions :**

 $(3 \times 10 = 30)$ 

- 18. Illustrate to concept of isolobolity. What is it significance of this concept? What are isolobal fragments and frenrier orbitals?
- 19. Discuss the preparation, properties and structure of Sodium nitroprusside.
- 20. Explain the different types of mechanism for oxidation addition reaction.
- 21. Discuss the structural features and properties of metal alkene and alkyne complexes.
- 22. What is Miyaura-Suzuki coupling? Why is the Miyaura-Suzuki coupling reaction important? Give its mechanism.



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**M.Sc. Chemistry** Degree (Semester) Examinations, November 2019 Part - III : Core Subject : Third Semester : Paper - III

#### PHYSICAL CHEMISTRY – III

Under CBCS - Credit 4

Time: 3 Hours

Max. Marks: 75

# **SECTION – A**

# **Answer ALL Questions :**

 $(5 \times 1 = 5)$ 

- 1. The total number of symmetry operations in BF<sub>3</sub> molecule is
  - a) 3 b) 6 c) 9 d) 12
- 2. All IR active modes are Raman active in

b) Acetylene a)  $CO_2$ c) hydrogen d)  $SO_2$ 

3. NMR spectroscopy is observed in

b) microwave d) gamma rays a) Visible c) radiowave

- 4. The number of lines observed for  $Mn^{2+}$  ion in ESR spectrum is:
  - b) 3 a) 1 c) 6 d) 4
- 5. What is the most important function of surfactant?
  - a) Lower surface tension
  - b) prevent pulmonary edema
  - c) maintaining the patency of small airway
  - d) Host defense

# **SECTION – B**

# **Answer any FIVE Questions :**

- 6. Explain point group.
- 7. Illustrate symmetry elements.
- 8. Interpret symmetry selection rule for electronic transition for ethylene molecule.
- 9. Explain relaxation process in NMR.
- 10. Outline the basic principle of NOR spectra.

11. Demonstrate zero field splitting in ESR.

12. Explain buffer and its action.

# **SECTION – C**

#### **Answer ALL Ouestions :**

 $(5 \times 6 = 30)$ 

13.a) Explain reducible and irreducible representation.

# (**OR**)

- b) Construct C<sub>2</sub>h point group.
- 14.a) Solve sp2 hybridization problem using group theory.

# $(\mathbf{OR})$

- b) Deduce the symmetry selection rules for IR and Raman active fundamental vibration.
- 15.a) Explain shielding and deshielding of magnetic nuclei.

# (**OR**)

b) Discuss <sup>13</sup>CNMR spectra.

16.a) Illustrate the factors affecting 'g' values.

# $(\mathbf{OR})$

i) Doppler effect b) Discuss ii) Kramer's degeneracy

17.a) Discuss the role of pulmonary surfactant.

#### (**OR**)

b) Explain buffer capacity.

# **SECTION – D**

#### $(3 \times 10 = 30)$

- 18. State and explain the great orthogonality theorem.
- 19. Evaluate energies and HMO's for butadiene.
- 20. Discuss the advantages of FTNMR.

**Answer any THREE Ouestions :** 

- 21. Evaluate the application of NQR spectra.
- 22. Discuss Henderson Hasselbach equation for acidic and basic buffer.

 $(5 \times 2 = 10)$ 



Time: 3 Hours

### VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

**M.Sc. Chemistry** Degree (Semester) Examinations, November 2019 Part – III : Elective Subject : First Semester : Paper – I

#### COMPUTER APPLICATIONS IN CHEMISTRY

Under CBCS – Credit 5

Max. Marks: 75

# $\underline{SECTION} - \underline{A}$

#### **Answer ALL Questions :**

 $(5 \times 1 = 5)$ 

 $(5 \times 2 = 10)$ 

- A number of letter that appears little above the normal text is called
   a) Superscript
   b) Subscript
   c) Supertext
   d) Toptext
- 2. In internet terminology IP means
  - a) Internet Providerb) Internet Protocolc) Internet Procedured) Internet process
- 3. In C programming language, which of the following type of operators have the highest precedence
  - a) Relational operatorsb) Equality operatorsc) Logical operatorsd) Arithmetic operators
- 4. Amount of HCl require for 0.1 N of HCl in 100 mL is
  - a) 0.36 g b) 0.56 g c) 0.46 g d) 0.26 g
- 5. Structure to name tool givesa) IUPAC name
  - c) Commercial name

# SECTION – B

b) General name

d) Chemical name

# **Answer any FIVE Questions :**

6. What is Microsoft Word?

- 7. Define the term URL?
- 8. How do you create e-mails?

- 9. What is an operator?
- 10. Write 'C' programme to calculate molarity.
- 11. How do you calculate p<sup>H</sup> of H solution?
- 12. Define chemdraw?

# **SECTION – C**

Answer ALL Questions :	$(5 \times 6 = 30)$
13.a) Explain the salient features of MS word.	(OR)
b) Briefly explain about Database.	
14. a) Write short notes on internet protocol.	( <b>OR</b> )
b) What are World Wide Web and give its features?	
15.a) Explain the symbolic constant with suitable examp	ples. (OR)
b) Explain about Beer's lamberts law.	
16.a) What is function? State its types.	( <b>OR</b> )
b) Write programme to calculate cell parameters.	
17.a) Differentiate between chemdraw and chem 3D.	( <b>OR</b> )
b) Develop the geometry optimization property.	
<u>SECTION – D</u>	
Answer any THREE Questions :	$(3 \times 10 = 30)$
18. List the significance of chem. draw.	
19. Discuss about the Electronic mail.	
20. Describe increment and decrement operator.	

- 21. Show the array and its types.
- 22. Explain the following terms with examples :
  - a) Molecular surface display b) NMR Simulation

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(Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

**M.Sc. / M.Com.** Degree (Semester) Examinations, November 2019 Part – III : Non-Major Elective Subject : Third Semester : Paper – I

#### FORENSIC CHEMISTRY – I

Under CBCS – Credit 5 Time: **3** Hours Max. Marks: **75** 

# <u>SECTION – A</u>

#### <u>Answer ALL Questions</u> :

 $(5 \times 1 = 5)$ 

1. The instrument used to detect lie said by a person is

a) cardiograph b) photograph c) polygraph d) none of the above

2. Which technique is used to analyzes the length of the strands of the DNA molecules?

a) PCR	b) RFLP	c) AmpFLP	d) STR
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- 3. Color test are also called \_\_\_\_\_\_ test.
  - a) spot b) chemical c) soil d) blood
- 4. Surface tension causes the blood drop to pull itself

a) Horizontally b) vertically c) both a and b d) neither a nor b

- 5. Which technique is used to document the skeletal characteristics of an unidentified body?
  - a) MRI b) CT c) Radiograph d) X ray

#### <u>SECTION – B</u>

#### **Answer any FIVE Questions :**

 $(5 \times 2 = 10)$ 

6. What does forensic psychiatry represent?

7. Define Forensic Pathology.

- 8. What is meant by Narco analysis?
- 9. Write down the polygraph test stages.
- 10. Define forensic generalist.
- 11. What is forensic serology?
- 12. Write any three physical characteristics done in Autopsy.

#### <u>SECTION – C</u>

#### **Answer ALL Questions :**

13.a) Give a gist of forensic odontology and forensic entomology.

#### (OR)

 $(5 \times 6 = 30)$ 

- b) Give a gist of forensic anthropology.
- 14.a) Mention briefly about the surface characteristics and collection methods in finger print.

#### (OR)

- b) Explain the procedures in detail during Polygraph test.
- 15.a) Discuss the following terms: i) comparative analysis
  - ii) Classification and iii) Individualization

#### (**OR**)

- b) Discuss the difference between latent, negative and plastic fingerprints.
- 16.a) Write down all the activities undertaken in serology division.

#### (**OR**)

b) What kind of results can be expected from blood pattern analysis?

17.a) Write down the important criteria followed in fire arm injuries in autopsy.

# (**OR**)

b) Mention briefly about the initial enquiry by forensic pathologist.

#### <u>SECTION – D</u>

#### Answer any THREE Questions :

 $(3 \times 10 = 30)$ 

# 18. What are the facilities available in the following branches of central forensic science laboratory of India for analysis of crime:

- a) Biology divisionb) Chemistry divisionc) Ballistics divisiond) Documents division
- 19. Sketch out the Precautions and Guidelines which are mainly involving in Narco Analysis.
- 20. Discuss the following terms : i) Questioned samples
  ii) known samples
  iii) Identification
  v) Presumptive analysis
  v) Confirmatory analysis
- 21. Explain in detail about blood types and paternity determination.
- 22. Explain briefly about the critical analysis of brain mapping.

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