



DV-003-001215

Seat No. _____

**B. Sc. Forensic Science (Sem. - II) (CBCS)
Examination**

April / May - 2015

FS - 201 : Forensics, Crime & Investigative Technique

Faculty Code : 003

Subject Code : 001215

Time : $2\frac{1}{2}$ Hours]

[Total Marks :70

- Instruction :** (1) This question paper contains three questions. All are compulsory.
(2) Draw neat and labeled diagrams wherever necessary.
(3) figure to the right indicate marks.

Q - 1 Marks Questions-multiple choice

(20)

1. -----not required any supporting medium for propagation.
A. Sound wave
B. Electromagnetic wave
C. A and B both
D. None
2. Wave length of X-Rays region is
A. 0.78 to 200 μm
B. 200 to 400 μm
C. 200 to 400 nm
D. 0.1 to 100 \AA
3. IR spectroscopy based on
A. Change in rotation and vibration of molecule.
B. Change in spin resonance
C. Electron excitation
D. All of the above
4. The diameter of helix of DNA is _____ \AA and _____ base pairs are present in each turn of helix.
A. 20 and 10
B. 10 and 20
a. and 10
C. None
5. Which sugar is present In RNA?
A. Ribose
B. Deoxyribose
C. Hexose
D. All
6. Rpm means
A. Rotation per minute
B. Recycle per momentum
C. Resize particle method
D. None

7. The range of pH of acidic solution is
- A. 8 to 14
B. 0 to 6
C. 1 to 14
D. 7
8. _____ are the pyrimidine.
- A. Adenine and Guanine
B. Cytosine and Guanine
C. Cytosine, Thymidine, Uresile
D. All
9. $\pi \rightarrow \pi^*$ transition occur in
- (A) $\text{CH}_2=\text{CH}_2$ (B) CH_3-CH_3 (C) $\text{CH}_3-\text{CH}_2-\text{CH}_3$ (D) CH_3OH
10. The rod of Nernst glower lamp composed of
- (A) Silicon carbide (B) Zirconium thorium (C) Mercury (D) Ni-cr
11. DNA is localized in the
- A. Nucleus
B. Mitochondria
C. Chloroplast
D. All of the above
12. Guanine pairs with _____ with _____ hydrogen bonds in DNA
- A. Pyrimidin, 3
B. Pyrimidin, 2
C. Cytosin, 3
D. Thymin, 2
13. Bolometers used as detector in
- (A) IR-spectroscopy (B) UV-spectroscopy
(C) HPLC (D) Gas chromatography
14. In Raman spectra, the lines to the right of Rayleigh peak and having higher value of wave no. are called as _____
- (A) Stoke lines (B) Anti-stoke lines
(C) None-stoke lines (D) Sub-stoke lines
15. Energy required for transition is
- (A) $6 \rightarrow 6^* > n \rightarrow 6^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$ (B) $n \rightarrow 6^* > 6 \rightarrow 6^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$
(C) $\pi \rightarrow \pi^* > n \rightarrow \pi^* > n \rightarrow 6^* > 6 \rightarrow 6^*$ (D) $n \rightarrow \pi^* > n \rightarrow 6^* > \pi \rightarrow \pi^* > 6 \rightarrow 6^*$
16. _____ is the example of disaccharide.
- A. Glucose
B. Sucrose
C. Fructose
D. All

17. _____ Quantum numbers tells about the shape of electron cloud and about nodal planes.
- A. Principle
B. Angular
C. Magnetic
D. Spin
18. Nernst glow lamp is used as a source in _____.
- A. IR Spectrometer.
B. UV Spectrometer
C. Mass Spectrometer
D. All
19. Pyroelectric detector works based on the
- A. Resistance change depend on temperature
B. Capacitance change depend on temperature
C. Electron mobility
D. Thermodynamics principle
20. Laser light is
- A. Monochromatic
B. Coherent
C. Directional
D. All of the above

Q – 2 Give the answers of following questions as per instruction

A. Write any three out of six. (6)

1. Define: Velocity and Wave number
2. What is Refraction?
3. Block diagram of instrumentation of double beam UV-Spectrophotometer.
4. Write a note on Monochromator.
5. Give the name of dyes which are used in Dye LASER.
6. What are the complimentary strands of following bases in RNA and DNA?
Also give the number of hydrogen bonds between them. ACGAC

B. Write any three out of six. (9)

1. What is central dogma?
2. Explain: Scattering.
3. Why deviation occurs from beer's law in UV-Visible spectroscopy?
4. What is nucleotide and nucleoside? Draw the structure of nucleotide.
5. Types of proteins on the basis of number of peptide bonds present.
6. Write a note on pH.

C. Write any two out of five. (10)

1. Write a note on chromophore and auxochrome.
2. Source of UV-Visible radiation.
3. Write a note on photocell and PMT detector of UV-spectroscopy.
4. Instrumentation of X-Rays spectroscopy.
5. Write a note on pH meter.

Q – 3 Give the answers of following questions as per instruction

A. Write any three out of six. (6)

1. What is Diffraction?
2. Forensic application of LASER.
3. Explain small bench centrifuge.
4. Give some example of source of carbohydrates.
5. What yields on complete hydrolysis of DNA or RNA?
6. What is buffer solution? And give the characteristics of buffer solution.

B. Write any three out of six. (9)

1. Properties of electromagnetic Radiation.
2. Define spectra and explain its types.
3. Explain the selection rules for electron transition from one energy level to another energy level.
4. List out the types of centrifuge technique and explain the differential centrifugation.
5. Write a note on complex polysaccharide.
6. Forensic application for UV-Visible spectroscopy.

C: Write any two out of five. (10)

1. Production of X-Rays.
 2. Explain Helium-Neon Laser.
 3. Write a note on DNA.
 4. Write a note on Quantum Numbers.
 5. Explain the Lambert's and Beer's law and give the reason why deviation occurs in beer's law during UV-Spectroscopy.
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