

# PRT Examination – 2013 (AKU Patna)

Sub:- Paper - I (Physics, Chemistry and Biochemistry & Biotechnology)

Time: - 1½ Hrs.

Full marks: 50

**INSTRUCTIONS:** -There are four options given for a question. You have choose the correct option/s. Candidates are required to submit this Question paper with answer book.

- The branch of Physics which deals with motion of a point like and rigid or deformable extended objects is called.  
(a) Quantum Mechanics  
(b) Classical Mechanics  
(c) Statistical Mechanics  
(d) None of these
- When  $\vec{r}$  is the position vector and  $\vec{p}$  is the linear momentum of a particle at a given instant, the angular momentum of the particle is given by.  
(a)  $\vec{L} = \vec{r} \times \vec{p}$       (b)  $\vec{L} = \vec{r} \cdot \vec{p}$       (c)  $\vec{L} = \vec{r} \vec{p}$       (d) None of these
- When  $\vec{v}$  is the velocity of a rotating frame, m is the mass of a particle, w is the angular velocity of the rotating frame, the carioles force is given by.  
(a)  $2m(\vec{w} \times \vec{v})$       (b)  $-2m(\vec{w} \times \vec{v})$       (c)  $m(\vec{v} \times w)$       (d)  $-m(\vec{v} \times \vec{w})$
- The Scattering of d- particle from the nucleus of an atom depends upon the :  
(a) Distance of closest approach      (b) Impact parameter  
(c) Strong electrostatic force      (d) None of these
- A particle is moving in a central force field of central potential  $\frac{1}{2} Kr^2$ , then the angular frequency of central orbit is:  
(a)  $w = \sqrt{Km}$ .      (b)  $w = \sqrt{m/K}$ .      (c)  $w = \sqrt{K/m}$ .      (d) None of these.
- The addition of any velocity to the velocity of light merely reproduces:  
(a) The velocity of light      (b) Greater than the Velocity  
(c) Velocity of ultrasound      (d) None of these.
- The Equation  $\nabla^2 V = 0$  is called then:  
(a) Poisson's equation in free space.  
(b) Laplace equation in free space.  
(c) Green's function.  
(d) None of these.
- The subscripts e, i & o stand for electronic, ionic & orientational polarization respectively. Which of the following equation correct:  
(a)  $P = P_e + P_i + P_o$       (b)  $P = P_e - P_i - P_o$   
(c)  $P = P_e + P_i + P_o$       (d)  $P = P_i + P_o - P_e$
- Only the hole current plays the important role in the operation of:  
(a) NPN Transistor      (b) PNP Transistor      (c) PIN diode      (d) triode value
- PIN diode acts as an ordinary diode legs to:  
(a) 100 MHz      (b) 200 MHz      (c) 300 MHz      (d) 10 MHz

11. When a NOT gate is combined with OR gate in cascade, the resultant gate is called:  
 (a) a NAND Gate (b) a NOR gate (c) a AND gate (d) None of these.
12. When a transistor amplifier is so biased that the output current flows for only less than half cycle of input signal, the amplifier is called:  
 (a) Class A Amplifier (b) Class B Amplifier  
 (c) Class C Amplifier (d) None of these.
13. Heisenber Uncertainly relation is given by:  
 (a)  $\Delta p \Delta q \geq \frac{\hbar}{4}$  (b)  $\Delta p \Delta q = \frac{\hbar}{2}$  (c)  $\Delta p \Delta q \geq \frac{\hbar}{2}$  (d) None of these
14. If  $L^2$  &  $L_z$  Commuter with each other then:  
 (a)  $[L^2, L_z] = 0$  (b)  $[L^2, L_z] = \hbar$  (c)  $[L^2, L_z] = \frac{\hbar}{2}$  (d) None of these
15. If and series is the spectral series in which the spectral lines correspond to the transition of electrons from higher energy state to the following orbit having:  
 (a)  $\eta f = 1$  (b)  $\eta f = 2$  (c)  $\eta f = 3$  (d)  $\eta f = 5$
16. Allowed transitions obey the:  
 (a) Hund rule  
 (b) Selection rule  $\Delta L = \pm 1$   
 (c) Spin resonance rule,  $\Delta L = + 1$   
 (d) None of these.
17. Surface tension of a liquid is determined by using  
 (a) Stalagmometer (b) Barometer (c) Hydrometer (d) None
18. The rate of disintegration of a radioactive substance is a  
 (a) Second order reaction  
 (b) Zero order reaction  
 (c) First order reaction  
 (d) All
19. The molecular weight of benzoic acid when determined by elevation in boiling point corresponds to  
 (a) 122 (b) Nearly 244 (c) 366 (d) 488
20. The mathematical equation  $(\Delta x) (\Delta p) \geq \frac{h}{4\pi}$  represents  
 (a) De Broglie equation  
 (b) Bragg's equation  
 (c) Heisenberg uncertainty principle  
 (d) Kirchoff's equation
21. Dipole Moment is zero for  
 (a)  $\text{CCl}_4$  (b)  $\text{CHCl}_3$  (c)  $\text{CH}_2\text{Cl}_2$  (d)  $\text{CH}_3\text{Cl}$
22. Complete grease – free glass wares can be done by  
 (a) Washing with water  
 (b) Washing with Nirma  
 (c) Washing with HCl

(d) Washing with Chromic acid

23. The eq. wt. of  $\text{Na}_2\text{CO}_3$  is

- (a) Same as its molecular weight
- (b)  $\frac{1}{3}$  of its molecular weight
- (c)  $\frac{1}{4}$  of its molecular weight
- (d)  $\frac{1}{2}$  of its molecular weight

24. Dimethyl glyoxime is a specific reagent for identifying

- (a) Cr
- (b) Ni
- (c) Pt
- (d) Ag

25. On adding  $\text{NH}_4\text{SCN}$  solution to ferric ion solution gives

- (a) Dark blood – red coloration
- (b) Dark blue coloration
- (c) Violet coloration
- (d) No change in color

26. In laboratory, 'brown – ring' test is performed for

- (a)  $\text{Cl}^-$
- (b)  $\text{SO}_4^{2-}$
- (c)  $\text{NO}_3^-$
- (d)  $\text{SO}_3^{2-}$

27. Lassaigne's test is performed for

- (a) Molecular weight determination
- (b) Basicity determination
- (c) Acidity determination
- (d) Elemental N, halogens, sulphur detection

28. Fresh aqueous solution of sodium nitroprusside is used for detecting

- (a) Halogens
- (b) Nitrogen
- (c) Sulphur
- (d) None

29. Menthol is a

- (a) Terpenoid
- (b) Carbohydrate
- (c) Alkaloid
- (d) None

30. Aldol condensation is exhibited by

- (a) HCHO
- (b)  $\text{CH}_3\text{CHO}$
- (c) Both
- (d) None

31. Molisch's test is performed for detecting

- (a) Alkaloids
- (b) Carbohydrates
- (c) alcohols
- (d) ketones

32. Myoglobin is a

- (a) Copper containing bio-molecule
- (b) Zinc containing bio-molecule
- (c) Chromium containing bio-molecule
- (d) Iron containing bio-molecule

33. Ozone film is found in the region

- (a) Troposphere
- (b) Ionosphere
- (c) Stratosphere
- (d) Exosphere

34. Starch & Cellulose are composed of several units of:

- (a) Glucose
- (b) Amino acids
- (c) Fatty acid
- (d) Nucleotides

35. Which one is not a carbohydrate?  
(a) Chitin (b) Methionine  
(c) Glycogen (d) Starch
36. Saturated fatty acids have double bonds:  
(a) 0 (b) 1  
(c) 2 (d) 3
37. The smallest structural units of protein are called:  
(a) Peptides (b) Proteases  
(c) Amino Acids (d) Peptones
38. Identify the protein that does not contain any metal:  
(a) Phytochrome (b) cytochrome  
(c) Glycoprotein (d) Ferritin
39. The formation of Acetyl COA from Pyruvic Acid is the result of its:  
(a) reduction (b) dehydration  
(c) dephosphorylation (d) oxidative decarboxylation
40. Coconut milk factor is:  
(a) Auxin (b) Gibberellin  
(c) cytokinin (d) abscisic acid
41. The pH suitable for ptylin action is  
(a) 6.8 (b) 7.8  
(c) 3.2 (d) 9.3
42. Plasmids are autonomously replicating mini chromosome found in:  
(a) Bacteriophage (b) Escherichia coli  
(c) Paramecium (d) Euglena
43. Main Function of PCR is  
(a) Sequencing of DNA (b) Amplification of DNA  
(c) Ligation of two DNA fragments (d) to add phosphate group to 5 end of DNA molecule
44. The technique in which foreign DNA precipitate on the surface of tungsten or gold particles shot into the target cells is known as  
(a) Microinjection (b) Chemical mediated gene transfer  
(c) Particle gun (d) Electroporation
45. The term 'hybridoma' implies  
(a) Gametic fusion (b) Hybrid vigour  
(c) Somatic hybridization (d) DNA – RNA hybrid
46. Restriction endonuclease is also known as  
(a) Molecular glue (b) DNA ligase  
(c) DNA polymerase (d) Molecular scissors

47. Reverse transcriptase is called:

- (a) RNA dependent DNA polymerase
- (b) DNA dependent RNA polymerase
- (c) DNA dependent DNA polymerase
- (d) RNA dependent RNA polymerase

48. Agrobacterium is:

- (a) Gram positive, pathogenic bacterium
- (b) Gram negative pathogenic bacterium
- (c) Gram positive, non pathogenic bacterium
- (d) Gram negative, non pathogenic bacterium

49. The transfer of genetic material from one cell to another by phase is called:

- (a) Trans formation
- (b) Conjugation
- (c) Transduction
- (d) Hybridization

50. 'HAC' stands for

- (a) Human Amplified Chromosome
- (b) Heart Amplified Chromosome
- (c) Human Artificial Chromosome
- (d) Heart Artificial Chromosome

