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**P.G. Entrance Examination, May - 2023****M.Sc. PHYSICS****Sub. Code : 58718****Day and Date : Monday, 08 - 05 - 2023****Total Marks : 100****Time : 03.30 p.m. to 05.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Each question carries 1 mark.
  - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
  - 4) Follow the instructions given on OMR sheet.
  - 5) Rough work shall be done on the sheet provided at the end of question paper.

**Select correct alternative for the following :**

- 1) \_\_\_\_\_ are the factors which affect the moment of inertia of a rotating system?  
A) Mass and velocity  
B) Density and temperature  
C) Shape and size  
D) Friction and air resistance
  
- 2) According to Newton's First Law, an object at rest will remain at rest unless acted upon by \_\_\_\_\_.  
A) a force  
B) an acceleration  
C) a mass  
D) torque
  
- 3) The fundamental force which holds the planets in their orbits around the sun is \_\_\_\_\_ force of attraction.  
A) electromagnetic  
B) electrostatic  
C) nuclear  
D) gravitational

***P.T.O.***

























- 66) In Wilson cloud chamber, a charged particle passing through a gas \_\_\_\_\_.
- A) produces positrons                      B) produces nuclear reactions  
C) makes the gas radioactive              D) ionizes the gas
- 67) The counting speed of semiconductor detector is \_\_\_\_\_.
- A) negligible                                      B) low  
C) high    D) very high
- 68) The two classes of hadrons are \_\_\_\_\_.
- A) leptons and mesons                      B) leptons and baryons  
C) mesons and baryons                      D) leptons and bosons
- 69) Elementary particles with zero spin and negative parity are called \_\_\_\_\_.
- A) Baryon    B) Pions  
C) Kaons    D) Both B) and C)
- 70) Heart of scintillation counter is \_\_\_\_\_.
- A) light guide                                      B) photomultiplier tube  
C) MgO-coating                                  D) phosphor
- 71) \_\_\_\_\_ is worthless energy not useful for doing work.
- A) Exergy    B) Power  
C) Anergy    D) Work done
- 72) From physics point of view, energy is nothing but \_\_\_\_\_.
- A) capacity to do work                      B) energy to work  
C) power to do work                          D) force to do the work





84) The total energy of a diatomic molecule is

A)  $E_{\text{Total}} = E_{\text{vibrational}} + E_{\text{rotational}}$

B)  $E_{\text{Total}} = E_{\text{vibrational}} - E_{\text{rotational}}$

C)  $E_{\text{Total}} = E_{\text{vibrational}} \times E_{\text{rotational}}$

D)  $E_{\text{Total}} = E_{\text{vibrational}} / E_{\text{rotational}}$

85) The original unscattered lines in Raman effect are called \_\_\_\_\_ lines.

A) Stark

B) Stokes

C) Antistokes

D) Rayleigh

86) The rotational transitions are governed by selection rule \_\_\_\_\_.

A)  $\Delta J = 1$

B)  $\Delta J = -1$

C)  $\Delta J = 0$

D)  $\Delta J = \pm 1$

87) Raman shift is characteristics of the \_\_\_\_\_ substance.

A) refracting

B) reflecting

C) transmitting

D) scattering

88) The Milky way Galaxy contains about \_\_\_\_\_ billion stars.

A) 20

B) 100

C) 5000

D) 2000



- 89) The Doublet separation increases with \_\_\_\_\_.
- A) atomic number ( $Z$ )
  - B) principle quantum number ( $n$ )
  - C) orbital angular momentum quantum number ( $l$ )
  - D) all the above
- 90) \_\_\_\_\_ of the following is not a spectral series.
- A) Fundamental
  - B) Diffuse
  - C) Principal
  - D) Elementary
- 91) The packing fraction of BCC crystal structure is \_\_\_\_\_.
- A) 0.52
  - B) 0.64
  - C) 0.68
  - D) 0.74
- 92) The number of atoms per unit cell in FCC crystal structure is \_\_\_\_\_.
- A) 2
  - B) 4
  - C) 6
  - D) 8
- 93) The lattice parameters,  $a=b=c$  for \_\_\_\_\_ crystal system.
- A) Cubic
  - B) Rhombohedral
  - C) Triclinic
  - D) Both Cubic and Rhombohedral
- 94) The example of hexagonal crystal structure is \_\_\_\_\_.
- A) Albite
  - B) Borax
  - C) Celestine
  - D) Zinc oxide



**Rough Work**

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