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Total No. of Questions : 6] [Total No. of Printed Pages : 4

**EG-199**

**B.E. I Semester (CGPA) CSE  
Examination 2018**

**ENGINEERING PHYSICS**

**Paper - CS-101**

*Time Allowed : Three Hours] [Maximum Marks : 60*

**Note :** All questions are compulsory and carry equal marks. Internal choice given in each question.

Q.1. Choose the correct answer. 10

i) The limit of resolution of the telescope in equal to

(a)  $\frac{1.22\lambda}{a}$  (b)  $\frac{a}{1.22\lambda}$

(c)  $\frac{1.22\lambda}{2\mu\sin\theta}$  (d)  $\frac{1.22\lambda}{2\sin\theta}$

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(2)

ii) If the light is polarised by reflection then the angle between reflected and refracted ray is

(a)  $\pi$  (b)  $\frac{\pi}{2}$

(c)  $2\pi$  (d)  $\frac{\pi}{4}$

iii) Active centre in Ruby laser is

(a) Al (b)  $\text{Cr}^{3+}$

(c)  $\text{O}_2$  (d)  $\text{Al}_2\text{O}_3$

iv) Pure dielectric medium is a

(a) Conductor (b) Insulator

(c) Semiconductor (d) None of these

v) The energy corresponds to 1 a.m.u. is

(a) 913 eV (b) 931 keV

(c) 931 MeV (d) 931 J

Q.2. a) Explain with a neat diagram the working of Fresnel's Biprism. 5

OR

Explain the Phenomenon of Fraunhofer diffraction at a single slit.

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(3)

b) How Nicol prism can be used as polarizer and analyzer? 5

OR

Find the expression for resolving power of Telescope and discuss it in detail.

Q.3. a) What is Compton effect? Derive an expression for Compton shift. 5

OR

State and explain Heisenberg's uncertainty principle.

b) Explain principle construction and working of any one laser. 5

OR

What are matter waves? Define group wave and Group velocity.

Q.4. a) Describe the Phenomenon of nuclear fission. Explain nuclear fission on the basis of liquid-drop model. 5

OR

Define and explain the term nuclear reaction cross-section.

b) What is betatron? Derive the betatron condition. 5

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(4)

OR

The frequency of 8 MHz is applied to dees of a cyclotron. Calculate the magnetic induction to accelerate a particle of mass  $1.602 \times 10^{-27}$  kg.

Q.5. Attempt any two of the following. 10

a) What are superconductors? Explain the significance of critical temperature.

b) What are Paramagnetic and diamagnetic materials?

c) What is Curie point or Curie temperature.

Q.6. Define and explain the three electric vector  $\vec{P}$ ,  $\vec{E}$  and  $\vec{D}$ . Why electric field inside a dielectric decreases due to polarisation? Show that  $\vec{D} = \epsilon_0 \vec{E} + \vec{P}$ . 10

OR

What are polar and non-polar molecules? Discuss the effect of electric field on polar dielectrics. What is meant by polarisation of dielectric?



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