

Roll No.

Total No. of Questions : 6]

[Total No. of Printed Pages : 4

**B.E. IInd Semester (CGPA)  
Examination, 2017**

**EF-316**

**CIVIL ENGG.  
(Engg. Physics)  
Paper : CE-202**

Time : 3 Hours]

[Maximum Marks : 60

**Note :-** All questions are compulsory and carry equal marks.  
Internal choice is given in each question, except first question.

I. Choose the correct answer :

(a) In Newton's ring arrangement the diameter of rings formed is proportional to :

- (i)  $\lambda$  (ii)  $\lambda^2$   
(iii)  $\sqrt{\lambda}$  (iv)  $\sqrt{\frac{1}{\lambda}}$

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(b) The energy corresponding to 1 a. m. u. is :

- (i) 931 eV (ii) 931 keV  
(iii) 931 MeV (iv) 931 J

(c) Active centre in Ruby laser is :

- (i) Al (ii)  $\text{Cr}^{+3}$   
(iii)  $\text{O}_2$  (iv)  $\text{Al}_2\text{O}_3$

(d) At low temperature, if the resistivity of a metal vanishes, then it is a :

- (i) Conductor (ii) Super-conductor  
(iii) Dielectric (iv) Insulator

(e) Which of the following is not the property of Photons ?

- (i) Momentum (ii) Energy  
(iii) Frequency (iv) Rest mass  $\frac{1}{2} \times 5 = 10$

2. (a) In Newton's ring experiment, the Diameter of 4<sup>th</sup> and 12<sup>th</sup> dark rings are 0.4 cm and 0.7 cm, respectively. Calculate the diameter of 20<sup>th</sup> dark ring. 5

(b) Give the construction and working of Fresnel's biprism with the help of a neat diagram. 5

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*Or*

Explain the conditions for maxima and minima for diffraction at a single slit. 5

3. (a) What is a wave function ? What are the necessary conditions of Physically acceptable wave function ? 4

(b) Establish the relation between group velocity, Phase velocity and Particle velocity. 6

*Or*

What is Compton effect ? Derive an expression for Compton shift. 6

4. (a) The frequency of SMHz is applied to dees of cyclotron. Calculate the magnetic induction to accelerate a particle of mass  $1.602 \times 10^{-27}$  kg. 4

(b) What is a Betatron ? Derive the betatron condition for successful acceleration of electrons. 6

*Or*

Describe a nuclear reactor. How does it work ? 6

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5. (a) What are cardinal points of a coaxial optical system ? 4

(b) Describe construction and working of a Ramsden's eyepiece. 6

*Or*

Two thin convex lenses of focal lengths 12 cm and 4 cm are separated by 8 cm. Plot the positions of the cardinal points for the combination. 6

6. Discuss in detail Foebes method for finding the coefficient of thermal conductivity of a metal bar.

*Or*

What is Stefan's law of radiation ? Give a laboratory method for determining Stefan's constant. 10

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