

**B.E. II Semester (CGPA) Civil
Engineering Exam. 2014****ENGINEERING PHYSICS****Paper : CE-202****Time Allowed : Three Hours****Maximum Marks : 60****Note :** All questions are compulsory.

All questions carry equal marks.

Q.1. Choose the correct answer –

- a) Brewster's law in terms of refractive index can be expressed as:
- (i) $\mu = \sin i_p$ (ii) $\mu = \cos i_p$
(iii) $\mu = \tan i_p$ (iv) $\mu = \cot i_p$
- b) The wavelength of x-rays is the order of
- (i) Centimeter (ii) Micron
(iii) Angstrom (iv) Meter
- c) What is the life-time of electron in metastable state?
- (i) 10^{-3} sec (ii) 10^{-5} sec
(iii) 10^{-8} sec (iv) 10^{-7} sec

(2)

d) Heisenberg's uncertainty principle is UITians

(i) $\Delta x \Delta E \geq \frac{h}{4\pi}$

(ii) $\Delta E \Delta P \geq \frac{h}{4\pi}$

(iii) $\Delta P \Delta x \geq \frac{h}{4\pi}$

(iv) $\Delta P \Delta t \geq \frac{h}{2\pi}$

e) A laser beam is mono chromatic. It means it has:

(i) Single Frequency (ii) Narrow Width

(iii) Several Colours (iv) Wide Width

Q.2. Discuss the principle, construction and working of Nicol Prism as Polariser.

OR

Explain the phenomenon of Fraunhofer diffraction at a single slit.

Q.3. Attempt any two -

- Apply Heisenberg's uncertainty principle to explain the Non-existence of electrons within the nucleus.
- What are continuous and characteristic X-rays and how are they produced? Explain X_{\min} is proportional to $1/V$.
- Discuss the essential requirements for producing laser action. Describe a He-Ne laser.

Q.4. Define chain reaction. What is nuclear reactor? State its principle.

(3)

UITians

OR

✓ Describe the principle, construction and working of a cyclotron.
Discuss its limitations.

Q.5. Two converging lenses of focal length 15 cm and 5 cm are placed co-axially 10 cm apart. Find the position of cardinal points of the system.

OR

Write short notes on any two of the following:

- i) Nodal Slide
- ii) Spherical and Chromatic aberrations
- , iii) Huygen's eye pieces.

Q.6. Attempt any two:-

- a) Discuss in detail. Forbes method for finding the coefficient of thermal conductivity of a metal bar.
- b) State Stefan's law of heat radiation and derive the law mathematically.
- c) Describe Lee's method to find the coefficient of thermal conductivity of metals.

