

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 9602

Roll No.

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### B. Tech.

(SEM. I) ODD SEMESTER THEORY  
EXAMINATION 2010-11  
ENGG. PHYSICS—I

Time : 2 Hours

Total Marks : 50

#### SECTION—A

1. Attempt **all** parts. All parts carry **equal** marks. (1×10=10)
- (a) Two photons approach each other, their relative velocity is :
- (i) zero (ii) c  
(iii) 2c (iv) c/2
- (b) Which of the following is invariant under Galilean transformation ?
- (i) velocity (ii) acceleration  
(iii) speed (iv) none of these
- (c) A path difference of  $3\lambda/2$  between the two waves corresponds to the phase difference :
- (i)  $3\pi/2$  (ii)  $\pi/3$   
(iii)  $3\pi$  (iv)  $2\pi/3$
- (d) In a biprism experiment 5 mm wide fringes are obtained on a screen 1.0 m away from the coherent sources by using light of wavelength 5000 Å. The separation between two coherent sources is :
- (i) 1.0 mm (ii) 0.1 mm  
(iii) 0.01 mm (iv) 0.05 mm

(e) Which of the following does not change the refraction of light ?

- (i) wavelength                      (ii) frequency  
(iii) velocity                      (iv) intensity

(f) If first secondary maximum of wavelength  $4600 \text{ \AA}$  falls on the first minimum of some wavelength  $\lambda$  in single slit diffraction pattern, the wavelength  $\lambda$  is :

- (i)  $6900 \text{ \AA}$                       (ii)  $2300 \text{ \AA}$   
(iii)  $4600 \text{ \AA}$                       (iv)  $4900 \text{ \AA}$

(g) Wave that cannot be polarized is :

- (i) electromagnetic wave      (ii) matter waves  
(iii) longitudinal wave      (iv) transverse wave

(h) If  $N_1$  and  $N_2$  are the numbers of atoms in ground state and excited state respectively, then in population inversion :

- (i)  $N_1 < N_2$                       (ii)  $N_1 > N_2$   
(iii)  $N_1 = N_2$                       (iv) None of these

(i) Light get attenuated in an optical fiber due to :

- (i) scattering                      (ii) micro bending  
(iii) absorption                      (iv) all the above

(j) If the hologram is broken into pieces, then :

- (i) there is irreparable loss of information  
(ii) entire image of the object is lost  
(iii) each piece is capable of reconstructing the entire image  
(iv) none of these