

**D****DPP-2932****B. Sc. (Sem. I) Examination****March / April – 2016****Applied Physics for Electronics : Paper - I****(For Electronics Special Course)**

Time : 2 Hours]

[Total Marks : 50

**Instructions :**

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<input type="text" value="B. Sc. (SEM. 1)"/>	<input type="text" value="Student's Signature"/>
Name of the Subject :	
<input type="text" value="APPLIED PHYSICS FOR ELECTRONICS - 1"/>	
Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="3"/> <input type="text" value="2"/>	Section No. (1, 2,.....): <input type="text" value="Nil"/>

- (2) All the questions are compulsory.
- (3) Symbols used in the paper have their usual meaning.
- (4) Figures to right indicate full marks.
- (5) Scientific calculator without memory can be used.

***O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ  
O.M.R. Sheet-ની પાછળ છાપેલ છે.  
Important instructions to fillup O.M.R. Sheet  
are given back side of provided O.M.R. Sheet.***

- 1 Doppler shift in frequency does not depend upon
- (A) The velocity of the source of sound
  - (B) The velocity of the observer
  - (C) distance from the source to the listener
  - (D) The frequency of the wave produced
- 2 Decibel is the unit of
- (A) x-ray radiation capacity
  - (B) sound loudness
  - (C) energy of radiation
  - (D) intensity of light
- 3 Force of gravity is least at
- (A) the poles
  - (B) a point in between equator and any pole
  - (C) none of these
  - (D) The equator
- 4 Orbital velocity of an orbital satellite does not depend upon
- (A) mass of the satellite
  - (B) radius of the earth
  - (C) acceleration due to gravity
  - (D) mass of the earth

- 5 A geostationary satellite
- (A) has time periods less than that of the near earth satellite
  - (B) moves faster than a near earth satellite
  - (C) is stationary in the space
  - (D) revolves about the polar axis
- 6 The unit of gravitational constant  $G$  is
- (A)  $\text{Nm}^2\text{kg}^2$
  - (B)  $\text{N/kg}^2\text{m}^2$
  - (C) none of these
  - (D)  $\text{Nm}^2/\text{kg}^2$
- 7 The only elastic modulus that applies to fluid is
- (A) shear modulus
  - (B) modulus of rigidity
  - (C) bulk modulus
  - (D) Young's modulus
- 8 Bulk modulus was first defined by
- (A) Bulk
  - (B) Maxwell
  - (C) None of these
  - (D) Thomas Young

- 9 The Poisson's ratio cannot have the value
- (A) 0.2
  - (B) 0.1
  - (C) 0.5
  - (D) 0.3
- 10 A For most materials,  $Y$  is  $n$  times the  $\eta$ , where  $n$  is
- (A) 3
  - (B) 4
  - (C) 5
  - (D) 2
- 11 Apparatus used to find out the velocity of sound in gas is
- (A) Kund's tube
  - (B) Quinck's tube
  - (C) none of these
  - (D) Melde's apparatus
- 12 The Doppler's effect is applicable for
- (A) sound waves
  - (B) space waves
  - (C) both light waves and sound waves
  - (D) light waves

- 13 The orbital velocity of an artificial satellite in a circular orbit just above the earth's surface is 'v'. For a satellite orbiting at an altitude of half the earth's radius, the orbital velocity is
- (A)  $\left(\frac{3}{2}\right)^{1/2} v$   
 (B)  $\left(\frac{2}{3}\right)^{1/2} v$   
 (C)  $\left(\frac{2}{3}\right) v$   
 (D)  $\left(\frac{3}{2}\right) v$
- 14 A material has  $\sigma = 0.50$ . If a uniform rod of it suffers a longitudinal strain of  $2 \times 10^{-3}$  then the % change in volume is
- (A) 0.4  
 (B) 0.2  
 (C) zero  
 (D) 0.6
- 15 If the Y of the material is 3 times its  $\eta$  then its volume elasticity will be
- (A) infinity  
 (B)  $2 \times 10^{10} \text{ N/m}^2$   
 (C)  $3 \times 10^{10} \text{ N/m}^2$   
 (D) zero
- 16 There is no change in volume of a wire due to change in its length on stretching. The Poisson's ratio of the material of the wire is
- (A)  $-0.50$   
 (B)  $+0.25$   
 (C)  $-0.25$   
 (D)  $+0.50$
- 17 The frequency of a whistle of an engine is 600cps is moving with the speed of 30 m/s towards an observer. The apparent frequency will be (velocity of sound = 300 m/s)
- (A) 660 cps  
 (B) 990 cps  
 (C) 330 cps  
 (D) 600 cps

- 18 A sound source is moving towards a stationary observer with  $\frac{1}{10}$  of the speed of sound. The ratio of apparent to real frequency is
- (A)  $\frac{11}{10}$
- (B)  $\left(\frac{11}{10}\right)^2$
- (C)  $\left(\frac{9}{10}\right)^2$
- (D)  $\frac{10}{9}$
- 19 A source and an observer approach each other with same velocity 50 m/s. If the apparent frequency is  $435 \text{ sec}^{-1}$ , then the real frequency is
- (A)  $360 \text{ sec}^{-1}$
- (B)  $390 \text{ sec}^{-1}$
- (C)  $420 \text{ sec}^{-1}$
- (D)  $320 \text{ sec}^{-1}$
- 20 If the pressure amplitude in a sound wave is tripled, then the intensity of sound is increased by a factor of
- (A) 3
- (B) 6
- (C) 10
- (D) 9
- 21 Weight of 1 kg becomes  $\frac{1}{6}$  on moon. If radius of moon is  $1.768 \times 10^6 \text{ m}$ , then the mass of the moon will be
- (A)  $765 \times 10^{22} \text{ kg}$
- (B)  $0.765 \times 10^{22} \text{ kg}$
- (C)  $7.65 \times 10^{22} \text{ kg}$
- (D)  $76.5 \times 10^{22} \text{ kg}$
- 22 A time period of a geostationary satellite at a height 3600 km is 24 hrs. A spy satellite orbits very close to earth surface ( $R = 6400 \text{ km}$ ). What will be its time period
- (A) 1 hrs
- (B) 2 hrs
- (C) 1.5 hrs
- (D) 4 hrs

- 23 The mass of Jupiter is  $1.9 \times 10^{27}$  kg, radius  $7.15 \times 10^7$  m. The escape speed of an object from the Jupiter is .
- (A) 59.5 m/s
- (B) 59.5 cm/s
- (C) 79.5 km/s
- (D) 59.5 km/s
- 24 The ratio of young's modulus and modulus of rigidity of a wire is 2.644. The value of Poisson's ratio is
- (A) 0.55
- (B) 0.62
- (C) 0.22
- (D) 0.322
- 25 The  $Y$  and  $\sigma$  of the material of a wire are  $13.6 \times 10^{10}$  mks and 0.5 respectively. The modulus of rigidity is
- (A)  $4.53 \times 10^{11}$  N/m<sup>2</sup>
- (B)  $4.53 \times 10^{12}$  N/m<sup>2</sup>
- (C)  $4.53 \times 10^9$  N/m<sup>2</sup>
- (D)  $4.53 \times 10^{10}$  N/m<sup>2</sup>

- 26 A source and an observer approach each other with same velocity 50 m/s. If the apparent frequency is  $435 \text{ Sec}^{-1}$ , then the real frequency is
- (A)  $360 \text{ Sec}^{-1}$
- (B)  $390 \text{ Sec}^{-1}$
- (C)  $420 \text{ Sec}^{-1}$
- (D)  $320 \text{ Sec}^{-1}$
- 27 When the intensity of sound increases  $10^6$  times its original intensity, the change in the intensity level is
- (A) 30 dB
- (B) 10 dB
- (C) 40 dB
- (D) 60 dB
- 28 An astronaut whose height  $h$  is 1.7 m. floats "feet down" in an orbiting space shuttle at a distance  $r = 6.77 \times 10^6$  m from the center of the earth. The difference between the gravitational acceleration at her feet and that at her head is ( $M_E = 5.98 \times 10^{24}$  kg,  $G = 6.67 \times 10^{-11} \text{ m}^3/\text{kg s}^2$ )
- (A)  $-4.37 \times 10^{-9} \text{ m/s}^2$
- (B)  $-4.37 \times 10^{-7} \text{ m/s}^2$
- (C)  $-4.37 \times 10^{-6} \text{ m/s}^2$
- (D)  $-4.37 \times 10^{-8} \text{ m/s}^2$