



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" value="B. Sc. (SEM. 1)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="APPLIED PHYSICS FOR ELECTRONICS - 1"/>	<input type="text"/>
Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="3"/> <input type="text" value="2"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (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 Force of gravity is least at
- (A) The equator
 - (B) the poles
 - (C) a point in between equator and any pole
 - (D) none of these
- 2 Orbital velocity of an orbital satellite does not depend upon
- (A) mass of the earth
 - (B) mass of the satellite
 - (C) radius of the earth
 - (D) acceleration due to gravity
- 3 A geostationary satellite
- (A) revolves about the polar axis
 - (B) has time periods less than that of the near earth satellite
 - (C) moves faster than a near earth satellite
 - (D) is stationary in the space
- 4 The unit of gravitational constant G is
- (A) Nm^2/kg^2
 - (B) Nm^2kg^2
 - (C) $\text{N}/\text{kg}^2\text{m}^2$
 - (D) none of these

- 5 The only elastic modulus that applies to fluid is
- (A) Young's modulus
 - (B) shear modulus
 - (C) modulus of rigidity
 - (D) bulk modulus
- 6 Bulk modulus was first defined by
- (A) Thomas Young
 - (B) Bulk
 - (C) Maxwell
 - (D) None of these
- 7 The Poisson's ratio cannot have the value
- (A) 0.3
 - (B) 0.2
 - (C) 0.1
 - (D) 0.5
- 8 A For most materials, Y is n times the η , where n is
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5

- 9 Apparatus used to find out the velocity of sound in gas is
- (A) Melde's apparatus
 - (B) Kund's tube
 - (C) Quinck's tube
 - (D) none of these
- 10 The Doppler's effect is applicable for
- (A) light waves
 - (B) sound waves
 - (C) space waves
 - (D) both light waves and sound waves
- 11 Doppler shift in frequency does not depend upon
- (A) The frequency of the wave produced
 - (B) The velocity of the source of sound
 - (C) The velocity of the observer
 - (D) distance from the source to the listener
- 12 Decibel is the unit of
- (A) intensity of light
 - (B) x-ray radiation capacity
 - (C) sound loudness
 - (D) energy of radiation

- 13 Weight of 1 kg becomes $\frac{1}{6}$ on moon. If radius of moon is 1.768×10^6 m, then the mass of the moon will be
 (A) 76.5×10^{22} kg
 (B) 765×10^{22} kg
 (C) 0.765×10^{22} kg
 (D) 7.65×10^{22} kg
- 14 A time period of a geostationary satellite at a height 3600 km is 24 hrs. A spy satellite orbits very close to earth surface ($R = 6400$ km). What will be its time period
 (A) 4 hrs
 (B) 1 hrs
 (C) 2 hrs
 (D) 1.5 hrs
- 15 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) $\left(\frac{3}{2}\right)v$
 (B) $\left(\frac{3}{2}\right)^{1/2} v$
 (C) $\left(\frac{2}{3}\right)^{1/2} v$
 (D) $\left(\frac{2}{3}\right)v$
- 16 A material has $\sigma = 0.50$. If a uniform rod of it suffers a longitudinal strain of 2×10^{-3} then the % change in volume is
 (A) 0.6
 (B) 0.4
 (C) 0.2
 (D) zero
- 17 If the Y of the material is 3 times its η then its volume elasticity will be
 (A) zero
 (B) infinity
 (C) 2×10^{10} N/m²
 (D) 3×10^{10} N/m²

- 18 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) -0.50
(C) +0.25
(D) -0.25
- 19 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) 600 cps
(B) 660 cps
(C) 990 cps
(D) 330 cps
- 20 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) $\frac{10}{9}$
(B) $\frac{11}{10}$
(C) $\left(\frac{11}{10}\right)^2$
(D) $\left(\frac{9}{10}\right)^2$
- 21 A source and an observer approach each other with same velocity 50 m/s. If the apparent frequency is 435 sec^{-1} , then the real frequency is
(A) 320 sec^{-1}
(B) 360 sec^{-1}
(C) 390 sec^{-1}
(D) 420 sec^{-1}
- 22 If the pressure amplitude in a sound wave is tripled, then the intensity of sound is increased by a factor of
(A) 9
(B) 3
(C) 6
(D) 10

- 23 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, $G = 6.67 \times 10^{-11}$ m³/kg s²)
- (A) -4.37×10^{-8} m/s²
- (B) -4.37×10^{-9} m/s²
- (C) -4.37×10^{-7} m/s²
- (D) -4.37×10^{-6} m/s²
- 24 The mass of Jupiter is 1.9×10^{27} kg, radius 7.15×10^7 m. The escape speed of an object from the Jupiter is
- (A) 59.5 km/s
- (B) 59.5 m/s
- (C) 59.5 cm/s
- (D) 79.5 km/s
- 25 The ratio of young's modulus and modulus of rigidity of a wire is 2.644. The value of Poisson's ratio is
- (A) 0.322
- (B) 0.55
- (C) 0.62
- (D) 0.22

- 26 The Y and σ of the material of a wire are 13.6×10^{10} mks and 0.5 respectively. The modulus of rigidity is
- (A) 4.53×10^{10} N/m²
 - (B) 4.53×10^{11} N/m²
 - (C) 4.53×10^{12} N/m²
 - (D) 4.53×10^9 N/m²
- 27 A source and an observer approach each other with same velocity 50 m/s. If the apparent frequency is 435 Sec^{-1} , then the real frequency is
- (A) 320 Sec^{-1}
 - (B) 360 Sec^{-1}
 - (C) 390 Sec^{-1}
 - (D) 420 Sec^{-1}
- 28 When the intensity of sound increases 10^6 times its original intensity, the change in the intensity level is
- (A) 60 dB
 - (B) 30 dB
 - (C) 10 dB
 - (D) 40 dB