



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 The unit of gravitational constant G is
- (A) $\text{N/kg}^2\text{m}^2$
 - (B) none of these
 - (C) Nm^2/kg^2
 - (D) Nm^2kg^2
- 2 The only elastic modulus that applies to fluid is
- (A) modulus of rigidity
 - (B) bulk modulus
 - (C) Young's modulus
 - (D) shear modulus
- 3 Bulk modulus was first defined by
- (A) Maxwell
 - (B) None of these
 - (C) Thomas Young
 - (D) Bulk
- 4 The Poisson's ratio cannot have the value
- (A) 0.1
 - (B) 0.5
 - (C) 0.3
 - (D) 0.2

- 5 A For most materials, Y is n times the η , where n is
- (A) 4
 - (B) 5
 - (C) 2
 - (D) 3
- 6 Apparatus used to find out the velocity of sound in gas is
- (A) Quinck's tube
 - (B) none of these
 - (C) Melde's apparatus
 - (D) Kund's tube
- 7 The Doppler's effect is applicable for
- (A) space waves
 - (B) both light waves and sound waves
 - (C) light waves
 - (D) sound waves
- 8 Doppler shift in frequency does not depend upon
- (A) The velocity of the observer
 - (B) distance from the source to the listener
 - (C) The frequency of the wave produced
 - (D) The velocity of the source of sound

- 9 Decibel is the unit of
- (A) sound loudness
 - (B) energy of radiation
 - (C) intensity of light
 - (D) x-ray radiation capacity
- 10 Force of gravity is least at
- (A) a point in between equator and any pole
 - (B) none of these
 - (C) The equator
 - (D) the poles
- 11 Orbital velocity of an orbital satellite does not depend upon
- (A) radius of the earth
 - (B) acceleration due to gravity
 - (C) mass of the earth
 - (D) mass of the satellite
- 12 A geostationary satellite
- (A) moves faster than a near earth satellite
 - (B) is stationary in the space
 - (C) revolves about the polar axis
 - (D) has time periods less than that of the near earth satellite

- 13 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) 390 sec^{-1}
 (B) 420 sec^{-1}
 (C) 320 sec^{-1}
 (D) 360 sec^{-1}
- 14 If the pressure amplitude in a sound wave is tripled, then the intensity of sound is increased by a factor of
- (A) 6
 (B) 10
 (C) 9
 (D) 3
- 15 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) $0.765 \times 10^{22} \text{ kg}$
 (B) $7.65 \times 10^{22} \text{ kg}$
 (C) $76.5 \times 10^{22} \text{ kg}$
 (D) $765 \times 10^{22} \text{ kg}$
- 16 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) 2 hrs
 (B) 1.5 hrs
 (C) 4 hrs
 (D) 1 hrs
- 17 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) $\left(\frac{2}{3}\right)^{1/2} v$
 (B) $\left(\frac{2}{3}\right) v$
 (C) $\left(\frac{3}{2}\right) v$
 (D) $\left(\frac{3}{2}\right)^{1/2} v$

- 18 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) 0.2
 (B) zero
 (C) 0.6
 (D) 0.4
- 19 If the Y of the material is 3 times its η then its volume elasticity will be
- (A) $2 \times 10^{10} \text{ N/m}^2$
 (B) $3 \times 10^{10} \text{ N/m}^2$
 (C) zero
 (D) infinity
- 20 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) +0.25
 (B) -0.25
 (C) +0.50
 (D) -0.50
- 21 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) 990 cps
 (B) 330 cps
 (C) 600 cps
 (D) 660 cps
- 22 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) $\left(\frac{11}{10}\right)^2$
 (B) $\left(\frac{9}{10}\right)^2$
 (C) $\frac{10}{9}$
 (D) $\frac{11}{10}$

- 23 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) 390 Sec^{-1}
- (B) 420 Sec^{-1}
- (C) 320 Sec^{-1}
- (D) 360 Sec^{-1}
- 24 When the intensity of sound increases 10^6 times its original intensity, the change in the intensity level is
- (A) 10 dB
- (B) 40 dB
- (C) 60 dB
- (D) 30 dB
- 25 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) $-4.37 \times 10^{-7} \text{ m/s}^2$
- (B) $-4.37 \times 10^{-6} \text{ m/s}^2$
- (C) $-4.37 \times 10^{-8} \text{ m/s}^2$
- (D) $-4.37 \times 10^{-9} \text{ m/s}^2$

- 26 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 cm/s
 - (B) 79.5 km/s
 - (C) 59.5 km/s
 - (D) 59.5 m/s
- 27 The ratio of young's modulus and modulus of rigidity of a wire is 2.644. The value of Poisson's ratio is
- (A) 0.62
 - (B) 0.22
 - (C) 0.322
 - (D) 0.55
- 28 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^{12} N/m²
 - (B) 4.53×10^9 N/m²
 - (C) 4.53×10^{10} N/m²
 - (D) 4.53×10^{11} N/m²