

**C****DE-2906**

B. Sc. (Sem. I) Examination
March / April - 2016
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="PHYSICS FOR ELECTRONICS : PAPER - 1"/>	<input type="text"/>
Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="0"/> <input type="text" value="6"/>	<input type="text" value="Student's Signature"/>
Section No. (1, 2,.....) : <input type="text" value="1,2,3"/>	

- (2) There are total 28 questions in this question paper. All are compulsory.
- (3) Symbols used in the question paper have their usual meaning.
- (4) Figures to the right indicate full marks of the questions.
- (5) Non-programmable scientific calculator can be used.

Q. 1 to 12 Multiple choice questions : (1 mark)

Q. 13 to 22 Multiple Choise Questions : (2 marks)

Q. 23 to 28 Multiple Choice Questions : (3 marks)

*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
is given on back side of the provided O.M.R. Sheet.*

- 1 Gravitational mass is proportional to gravitational :
- (A) intensity
 - (B) All of these
 - (C) field
 - (D) force
- 2 The increase in length is ' l ' of a wire of length ' L ' by the longitudinal stress. Then the stress is :
- (A) $L \times l$
 - (B) $l^2 \times L$
 - (C) L/l
 - (D) l/L
- 3 Which is the most elastic material ?
- (A) Quartz
 - (B) Wood
 - (C) Iron
 - (D) Copper
- 4 According to Hooke's law force is proportional to :
- (A) x
 - (B) x^2
 - (C) $1/x$
 - (D) $1/x^2$

- 5 If a spring is extended to length 'x', then according to Hooke's law :
- (A) $F=k^2 x$
 - (B) $F= k^2 /x$
 - (C) $F=k x$
 - (D) $F= k/x$
- 6 Maximum number of beats frequency heard by a human being is
- (A) 20
 - (B) 6
 - (C) 10
 - (D) 4
- 7 A string fixed at both the ends is vibrating in two segments. The wavelength of the corresponding wave is :
- (A) 1
 - (B) 2l
 - (C) $l/4$
 - (D) $l/2$
- 8 On which principle sonometer works ?
- (A) Resonance
 - (B) Newton's law
 - (C) Hooke's law
 - (D) Elasticity

- 9 If the temperature increases ,then what happens to the frequency of the sound produced by the organ pipe ?
- (A) Unchanged
 - (B) None of these
 - (C) Increases
 - (D) Decreases
- 10 The tidal waves in the sea are primarily due to :
- (A) the gravitational effect of the venus on the earth
 - (B) the gravitational effect of the uranus on the earth
 - (C) the gravitational effect of the moon on the earth
 - (D) the gravitational effect of the sun on the earth
- 11 If the distance between two masses is doubled, the gravitational attraction between them :
- (A) is reduced to half
 - (B) is reduced to a quarter
 - (C) is doubled
 - (D) becomes four times
- 12 The gravitational force F_g between two objects does not depend on :
- (A) gravitational constant
 - (B) distance between the masses
 - (C) sum of the masses
 - (D) product of the masses

- 13 To increase the frequency from 100Hz to 400Hz the tension in the string has to be changed by :
- (A) 20 times
 - (B) None of these
 - (C) 4 times
 - (D) 16 time
- 14 A tuning fork vibrates 2 beats in 0.04 sec. The frequency of the fork is :
- (A) 80 Hz
 - (B) None of these
 - (C) 50 Hz
 - (D) 100 Hz
- 15 In a satellite if the time of revolution is T, then KE is proportional to :
- (A) $1/T^3$
 - (B) $T^{-2/3}$
 - (C) $1/T$
 - (D) $1/T^2$
- 16 The period of satellite in a circular orbit of radius R is T, the period of another satellite in a circular orbit 4R is :
- (A) 8T
 - (B) T/8
 - (C) 4T
 - (D) T/4
- 17 A body revolves around the sun 27 times faster than the earth. What is the ratio of their radii ?
- (A) 1/27
 - (B) 1/4
 - (C) 1/3
 - (D) 1/9

- 18 The upper end of a wire of radius 4 mm and length 100 cm is clamped and its other end is twisted through an angle of 30° . The angle of shear is :
- (A) 1.2°
 - (B) 0.012°
 - (C) 12°
 - (D) 0.12°
- 19 A 2 m long rod of radius 1 cm which is fixed from one end is given a twist 0.8 radians. The shear strain is developed will be :
- (A) 0.008
 - (B) 0.016
 - (C) 0.002
 - (D) 0.004
- 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 displacement of a particle is $x = 3 \sin(5\pi t) + 4 \cos(5\pi t)$, the amplitude of the particle is :
- (A) 5
 - (B) 7
 - (C) 3
 - (D) 4
- 22 Two waves of wavelengths 50 cm and 51 cm produced 12 beats/sec. The velocity of sound is :
- (A) 340 m/s
 - (B) 360 m/s
 - (C) 306 m/s
 - (D) 331 m/s

- 23 Two waves of lengths 1 m and 1.01 m produces 10 beats in 3 seconds in a gas, then the velocity of sound in a gas is :
- (A) 436.67 m/s
- (B) 536.67 m/s
- (C) 336.67 m/s
- (D) 336.67 cm/s
- 24 A hall of volume 5500 m^3 is found to have a reverberation time of 2.3 s. The sound absorbing surface of the hall has an area of 750 m^2 . The average absorption coefficient is :
- (A) 0.404
- (B) 0.704
- (C) 0.504
- (D) 0.604
- 25 If mass of the earth is $5.98 \times 10^{24} \text{ kg}$, radius is $6.37 \times 10^6 \text{ m}$ and G is $6.67 \times 10^{-11} \text{ m}^3 / \text{kg} \cdot \text{s}^2$, then the escape speed of a body from the earth's surface is :
- (A) 11.2 cm/s
- (B) 41.2 km/s
- (C) 11.2 km/s
- (D) 11.2 m/s

- 26 A playful astronaut releases a bowling ball of mass $m = 7.2 \text{ kg}$ in to a circular orbit about at an altitude 'h' of 350 km. The mechanical energy of the ball in its orbit is ($R = 6370 \text{ km}$, $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$, $M = 5.98 \times 10^{24} \text{ kg}$)
- (A) -2.14 MJ
- (B) -214 J
- (C) -214 MJ
- (D) -21.4 MJ
- 27 Y and η of a wire is $11.25 \times 10^{10} \text{ mks}$ and $4.55 \times 10^{10} \text{ mks}$ respectively. The Bulk modulus of rigid body is :
- (A) $7.1 \times 10^9 \text{ N/m}^2$
- (B) $7.1 \times 10^{12} \text{ N/m}^2$
- (C) $7.1 \times 10^{10} \text{ N/m}^2$
- (D) $7.1 \times 10^{11} \text{ N/m}^2$
- 28 A steel rod of length 3.0m and 2.5 cm diameter is tightly clamped at one end and a twisting torque of 55Nm is applied at free end. If η of steel is $8 \times 10^{10} \text{ mks}$, the angle of twist of the rod in degrees is :
- (A) 0.076
- (B) 0.5
- (C) 0.038
- (D) 0.060