

S.B. Roll No.....

APPLIED PHYSICS – I
1st Exam /Common/2355/0351/5403/Nov' 2016

Duration: 3Hrs

M. Marks=75

SECTION – A

Q1. a) Fill in the blanks : **5x1 = 5**

- (i) Energy and power have _____ dimensions.
- (ii) It is impossible to go around a curved path _____ acceleration.
- (iii) Radius of gyration have the unit of _____.
- (iv) Bulk modulus of a perfect rigid body is _____.
- (v) In convection the heat is transferred by _____ of particles.

b) Choose true/false : **5x1 = 5**

- (i) The equation $v^2 + u^2 = 2as$ is dimensionally correct.
- (ii) Current is a vector quantity.
- (iii) Work done in raising a load depends upon the time in which it is done.
- (iv) Analogue of mass in rotator motion is moment of inertia.
- (v) Melting point of ice on Kelvin scale is ok.

c) Choose the correct answer : **5x1 = 5**

- (i) A difference of temperature of 25°C is equivalent to a difference of
(a) 45°F (b) 72°F (c) 32°F (d) 25°F
- (ii) For pure water and clean glass the angle of contact is
(a) 0° (b) 90° (c) 180° (d) 60°
- (iii) The torque on a body is zero which of the following should not change
(a) Linear velocity (b) Angular velocity (c) Force (d) None of these
- (iv) For the resultant of two vectors to be maximum, the angle between them is :
(a) 0° (b) 60° (c) 90° (d) 180°
- (v) How many significant figures are there in 40.00?
(a) 1 (b) 2 (c) 3 (d) 4

SECTION B

Q2. Attempt any six questions : **6x5 = 30**

- (i) Check the correctness of the relation $t=2\pi \sqrt{l/g}$ where l is length and g is acceleration due to gravity.
- (ii) Show that newton's second law of motion is real law of motion.
- (iii) Two equal forces have their resultant equal to the either force. At what angle are they inclined to each other ?
- (iv) What are laws of friction ?
- (v) State and prove law of conservation of angular momentum.
- (vi) A force of 40 N is applied on a nail, whose up has an area of cross section of 0.001 cm². Find the pressure on the up.
- (vii) Define young's modulus of elasticity (y). Give mathematical expression & SI unit of it.
- (viii) Define heat and temperature on the basis of kinetic theory of gases. What is difference between heat and temperature ?

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SECTION C

Attempt any three questions:

10x3 = 30

Q3.(a) The wavelength λ associated with a moving particles depends upon its mass m , velocity v and planck's constant h . Show dimensionally that $\lambda \propto \frac{h}{mv}$. (7)

(b) The maximum error in the measurement of mass and length are 3% and 2% respectively. Find the maximum error in the measurement of density. (3)

Q4.(a) It is easier to pull a lawn roller than to push it. Explain. (5)

(b) What is banking of roads? Explain (5)

Q5. What is law of conservation of energy?

Explain conservation of mechanical energy of a freely falling body. (10)

Q6.(a) Derive the relation between various scales of temperature. (7)

(b) At what temperature on Fahrenheit scale will be double of reading on Celsius scale. (3)