

S.B. Roll No.....

APPLIED PHYSICS-I
1st Exam/Common/2355/0351/5403/Nov'18

Duration: 3Hrs.

M.Marks:75

SECTION-A

Q1. a) Fill in the blanks. 15x1=15

- i. Dimensional formula of pressure is _____
- ii. Vectors having same magnitude and same direction are called _____ vectors.
- iii. Sound waves are _____ in nature.
- iv. Momentum is a product of mass and _____
- v. _____ is used to measure very high temperature.

b) State True or False.

- vi. Rockets works on the principle of conservation of momentum.
- vii. Surface tension of liquid increases with increase in temperature.
- viii. Velocity of sound on vacuum is 3×10^8 m/s.
- ix. Cubical expansion is related with change in volume.
- x. Centripetal force is given by mv^2/r .

c) Multiple choice questions.

- xi. Dimensional formula of angular velocity is same as that of

a) Linear velocity	b) Acceleration	c) Frequency	d) Speed
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- xii. Newton's first law of motion gives the concept of

a) Energy	b) Work	c) Momentum	d) Inertia
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- xiii. One Horse power in terms of watt is

a) 7.46 watt	b) 74.6 watt	c) 746 watt	d) 74 watt
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- xiv. Which of the following is not a unit of pressure?

a) Torr	b) Bar	c) N/m^2	d) Tesla
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- xv. If temperature of a patient is $40^{\circ}C$, his temperature in Kelvin scale is

a) 273 K	b) 323 K	c) 312 K	d) 313 K
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SECTION-B

Q2. Attempt any six questions. 6x5=30

- a. Check the accuracy of the relation $v^2 - u^2 = 2as$
- b. Prove that the vectors \vec{A} and \vec{B} are perpendicular to each other: $\vec{A} = \hat{i} + 2\hat{j} + 3\hat{k}$, $\vec{B} = 2\hat{i} - \hat{j}$
- c. Differentiate between longitudinal and transverse waves.
- d. State the laws of friction.
- e. State theorem of perpendicular axis.
- f. Differentiate between Streamline, Turbulent and Laminar flow.
- g. Friction is a necessary evil. Justify.
- h. What is Hooke's law?

SECTION-C

Attempt any three questions. 3x10=30

- Q3. a)** Prove that Newton's second law of motion is real law of motion. 7
- b)** A force of 50N is applied on a mass of 5 kg. What will be the acceleration on the mass? 3
- Q4.** A body of mass m is moving with uniform speed v in a circle of radius r. Find and expression for centripetal force F by the method of dimensions. 10
- Q5. a)** What is the difference between scalars and vectors? Explain with examples. 5
- b)** Why lubricants are used in machines? 5
- Q6.** What are different modes of transfer of heat? Explain with examples 10
- Q7. a)** State law of conservation of angular momentum. 5
- b)** What is moment of inertia? Write down the formulas of moment of inertia of ring and disc. 5
- Q8.** What is Simple harmonic motion? Derive the expression for displacement and velocity in S.H.M. 10