S.B. Roll No...

APPLIED MECHANICS
3ʳᵈExam/Common/0519/0569//0931/Nov'15

Duration: 3 Hrs   **M.Marks=75**

SECTION-A

Q-1: Fill the blanks   **1x15 =15**

  i.   Velocity is a ....quantity.
  ii. Mass and weight have....................units.
  iii. Forces must possess.................
  iv. Moment of a force =.................... x perpendicular distance.
  v.   The moment of couple is known as......................
  vi. Friction always acts in the direction..............to the motion.
  vii. Sliding friction is always ....than the rolling friction.
  viii. The C.G of a semicircle lies at a distance of ....from the base.
  ix. C.G is a term used for ....bodies.
  x.   Input is always ....than output.

  State True / False:.
  xi.   Force is a vector quantity.
  xii. The unit of force is dyne.
  xiii. The algebraic sum of moments is equilibrium is equal to zero.
  xiv. Dynamic friction is also called Kinetic friction.
  xv.   Centroid is a term used for bodies having area only but no mass.

SECTION-B

Q-2: Attempt any FIVE questions   **6x5=30**

  a) State and prove parallelogram law of forces?
  b) What is difference between scalar quantities and vector quantities?
  c) What is couple? Mention important properties of a couple?
  d) What is lever? Give the names of levers?
  e) How does a lubricant reduce friction?
  f) Discuss the advantage and disadvantage of frictions.
  g) Explain various methods of determining Centre of gravity?
  h) What are the advantages of machines?

SECTION-C

Q-3: Attempt any THREE questions   **10x3=30**

  a) Two equal forces act on a particle, find the angle between them when square of their resultant is equal to three times their product?
  b) Four forces of magnitudes 2P, 3P, 4P and 5P act respectively along the sides of a square taken in order. Determine the magnitude, direction and position of resultant force, Take each side of the square = 2m long.
  c) The force required to pull a body of weight 100 N on a rough horizontal plane is 30 N. Determine the coefficient of friction if the force is applied at an angle of 20^0 with the horizontal.
  d) Find the centre of gravity of a channel section 100x50x15 mm.