S. B. Roll. No.....

**APPLIED MECHANICS**
**3rd Exam/Civil/Mech./Auto/0093/Jun'2022**
**(For 2018 Batch Onwards)**

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

**SECTION-A**

**Q1. Fill in the blanks.** **15x1=15**

a. Moment of force = Force x_____
b. The turning effect of a force is called_____
c. Oil is used to _____Friction.
d. _____is the ratio of output and input.
e. Definition of force follows from Newton's _____law
f. An ideal machine is one in which efficiency is_____
g. Friction always acts in direction _____to the motion.
h. _____is the point through which the whole area of a plane figure may be assumed to act.
i. _____Forces are those which act at a single point.
j. Force is a _____Quantity.
k. Equilibrant force is equal and opposite to the _____Force.
l. Moment of a couple about any point in its plane is_____
m. Friction of steel is _____Than that in cast iron.
n. The amount of matter contained in a body is called it's_____
o. _____is the ratio of distance moved by the effort to the distance moved by the load.

**SECTION-B**

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

i. Differentiate between mass wand weights.
ii. Define the terms: a) Mechanical Advantage b) Velocity ratio c) Efficiency
iii. Explain the methods of reducing friction.
iv. Explain the concept of free body diagram using suitable examples.
v. Write a short note on Lami's Theorem.
vi. Define the terms: a) Axis of reference b) Axis of symmetry
vii. What are the characteristics of a force?
viii. What are the different types of loads act on beams?

**SECTION-C**

**Q3. Attempt any three questions.** **3x10=30**

a. What do you mean by a force system? Explain the various force systems.
b. Find the position of a centroid of a channel section 5cm x 12cm x 1cm as shown in **fig.1**
c. Compute the moment of 100N force about point A and B for the force system shown in **fig 2**
d. Find the magnitude and direction of the resultant of forces shown in **fig 3.**
e. The force required to pull a body of weight 100N on a rough horizontal plane is 30N. Determine the coefficient of friction if the force is applied at an angle of 20° with the horizontal.

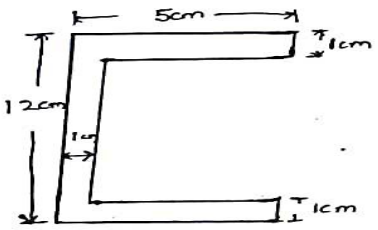

fig. 1

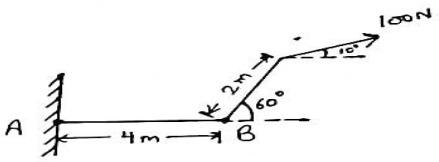

fig. 2

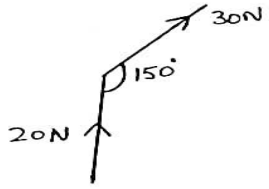

fig. 3