BACHELOR OF SCIENCE (CBCS-2018 COURSE)
F. Y. B. Sc. Sem-I : WINTER- 2022
SUBJECT : PHYSICS : MECHANICS & PROPERTIES OF MATTER

Day : Monday | Time : 10:00 AM-01:00 PM

Date : 5/12/2022 | **W-18292-2022** | Max. Marks : 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Draw neat and labeled diagrams **WHEREVER** necessary.

Q 1. Attempt any **Two** of the following. **(12)**

(a) Derive an expression for the work done during variable force.
(b) Obtain an expression for the cantilever.
(c) With neat suitable diagram, explain Venturimeter.

Q 2. Attempt any **Two** of the following. **(12)**

(a) Derive the formula for elastic constants Y, η and K.
(b) Describe in detail, Jaeger's method to determine the surface tension of a liquid.
(c) Describe the various types of forces in nature.

Q 3. Attempt any **Two** of the following. **(12)**

(a) Define conservative force with suitable example. Show that work done by the conservative force during a round trip journey or closed path is equal to zero.
(b) With neat suitable diagram, explain streamline flow and turbulent flow.
(c) Derive the expression for work energy theorem.

Q 4. Attempt any **Three** of the following. **(12)**

(a) Define stress and strain. What is the relation between them?
(b) A metal wire of 10 m length extendsed by 1 cm when a force of 45 N is applied to it. How much force is required to elongate the wire up to 1.2 cm.
(c) State the difference between inertial and non inertial frame of reference.
(d) Write a short note on angle of contact.

Q 5. Attempt any **Four** of the following. **(12)**

(a) Derive an expression for surface tension and surface energy.
(b) Explain mass energy equivalence.
(c) Write a short note on change of plane of motion of a spinning ball.
(d) Write down the applications of surface tension.
(e) Explain pseudo force.
(f) Explain Kepler's laws of motion.

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