

II- SEM/COMMON/2019(W)/NEW

Th. 2a-ENGINEERING PHYSICS

Full Marks: 80

Time: 3 Hours

Answer any **Five** Questions including Q No.1&2

Figures in the right hand margin indicates marks

1.	<p>Answer ALL questions.</p> <p>(a) Express 1 Joule into erg.</p> <p>(b) A force of 100N is resolved into two equal components at 60° to each other. Find the magnitude of each component.</p> <p>(c) Establish a relation between linear velocity & angular velocity.</p> <p>(d) State two methods to reduce friction.</p> <p>(e) Write down the S.I. unit and dimension of specific heat.</p> <p>(f) What are the conditions for minimum deviation when a ray of light passes through a prism?</p> <p>(g) Two capacitors of capacitances C_1 and C_2 are connected in parallel. If a charge Q is given to the assembly the charge gets shared. What is the ratio of the charge on the capacitor C_1 to the charge on the capacitor C_2?</p> <p>(h) The gravitational force between two objects is F. If masses of both the objects are halved without altering the distance between them, then what will be the change in gravitational force?</p> <p>(i) State Fleming's Left Hand Rule.</p> <p>(j) Define Population Inversion.</p>	2×10
2.	<p>Answer any SIX questions.</p> <p>(a) Check the correctness of the following equation by dimensional analysis where the symbols have their usual meaning.</p> $T = 2\pi \sqrt{\frac{l}{g}}$ <p>(b) State the properties of magnetic lines of force.</p> <p>(c) Distinguish between mass and weight.</p> <p>(d) How much heat is needed to convert 0.005 kg of ice at 0°C to water at 10°C?</p> <p>(e) Define optical fibre. Mention two of its properties and applications.</p> <p>(f) Derive a relation between 1) farad and stat farad 2) farad and ab farad</p> <p>(g) State laws of limiting friction.</p>	5×6
3.	<p>Derive an expression for equation of trajectory, time of ascent and maximum height of a projectile fired at an angle θ with the horizontal.</p>	10

(Turn over)

1/2

4.	Derive an expression for displacement, velocity and acceleration of a particle executing S.H.M.	10
5.	State and explain Kirchhoff's laws with an example. Derive the condition for a balanced Wheatstone bridge.	10
6.	State Faraday's law of electro magnetic induction. A field of 0.0125 T is at right angles to a coil of area $5 \times 10^{-3} \text{ m}^2$ with 1000 turns. It is removed from the field in 1/20 s. Find the e.m.f. produced.	10
7.	Establish the relation between α , β & γ . A piece of copper wire has a length of 2m at 0°C . Find its length at 100°C . Given $\alpha = 17 \times 10^{-6} \text{ }^\circ\text{C}^{-1}$.	10