

**1STSEM./CIVIL/ELECT/ETE/MECH/AUTO/AE & IE /CSE
/CHEM/MINING/CERAMIC/IT/AERO/EEE/2021(W) OLD
BST-101 ENGINEERING PHYSICS**

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. State the principle of Homogeneity.
 - b. Define cross product of 02 vectors.
 - c. What is static friction?
 - d. Define uniform circular motion.
 - e. What is Doppler's effect?
 - f. Define Mechanical Equivalent of Heat
 - g. What is Fibre Optics?
 - h. Under what conditions does Ohm's law hold good?
 - i. Define Magnetic Flux Density (\vec{B}).
 - j. State Lenz's law.
2. Answer **Any Six** Questions 5 x 6
 - a. 02 forces equal in magnitude, have magnitude of their resultant equal to either. Find the angle between them.
 - b. State & explain Kepler's laws of Planetary motion.
 - c. Compare longitudinal waves with transverse waves.
 - d. Explain Total Internal Reflection & Critical Angle.
 - e. The total capacitance of 02 capacitors is 2 μF when connected in series and 9 μF when connected in parallel. Find out the capacitance of each other.
 - f. State & explain Kirchoff's (i) Current Law (ii) Voltage Law
 - g. Establish Einstein's photo electric equation.
3. Obtain equations for (i) Trajectory (ii) Maximum Height Obtained (iii) Time of Flight of a projectile fired at an angle ' θ ' with horizontal. 4+3+3
4. Explain Simple Harmonic Motion (SHM) as a projection of Uniform Circular Motion along any diameter. Derive formula for velocity & acceleration of a body in SHM. 5+3+2
5. Derive the relation $C_p - C_v = R$ where symbols used carry usual meaning 10
6. State & explain Coulomb's Law in Magnetism. Explain unit pole using the law. 5+5
7. State & explain Faraday's law of electromagnetic Induction. Compare Fleming's Right Hand Rule and Left Hand Rule. 5+5