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

Th. 2(a) 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.	Answer ALL the questions:	2×10
(a)	Write down the units of the following physical quantities : i) Power ii) Wavelength iii) Stress iv) Torque	
(b)	State parallelogram law of vector addition.	
(c)	Given $\vec{A} = 4\hat{i} + 3\hat{j} + 2\hat{k}, \vec{B} = 5\hat{i} + 2\hat{j} + \hat{k}$. Find $\vec{A} \times \vec{B}$	
(d)	Under what condition the range of a projectile is maximum?	
(e)	Write down two applications of Ultrasonics.	
(f)	Define Joule's Mechanical equivalent of heat.	
(g)	State the laws of reflection.	
(h)	Write down two applications of optical fibre.	
(i)	Define Unit pole.	
(j)	State Lenz's law.	
2.	Answer any SIX questions:	
(a)	Check the correctness of formula dimensionally. $T = 2\pi\sqrt{\frac{l}{g}}$	5 × 6
(b)	State Kepler's laws of planetary motion.	
(c)	Distinguish between longitudinal and transverse wave.	
(d)	Discuss the properties of ultrasonic.	
(e)	Define critical angle and total internal reflection.	
(f)	State and explain Coulomb's law of electrostatics.	
(g)	Distinguish between Fleming's left hand rule and Fleming's right hand rule.	
3.	Derive expression for Equation of trajectory, Time of flight, maximum height for a projectile fired at an angle θ with the horizontal.	10
4.	State the laws of limiting friction and discuss the methods to reduce friction.	10

5.i)	State and explain Newton's laws of gravitation.	6
ii)	Derive a relation between g &G.	4
6.	How much steam at 100^0 C will melt 3.2 kg of ice at -10^0 C ? Given that the Specific heat capacity of ice =0.5Kcalkg^{-1}, Specific latent heat of steam = 540 Kcalkg^{-1}, Specific latent heat of ice =80 Kcalkg^{-1} .	10
7.i)	State Kirchhoff's laws.	4
ii)	Find the equivalent resistances between A &B.	6