

2ND SEM ./COMMON / 2023(S)NEW

TH-2(a) 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. Write down the **S.I.** units of :
- i. Work
 - ii. Electric Potential
 - iii. Frequency
 - iv. Speed
- b. If $\vec{A} = 2\hat{i} - 3\hat{j} + \hat{k}$ & $\vec{B} = 4\hat{i} + 2\hat{j}$, then find out their dot product.
- c. Define Angular velocity.
- d. Three capacitors of capacitance 2F, 3F, & 5F are connected in parallel. Calculate the equivalent capacitance.
- e. State the First law of Thermodynamics.
- f. Draw a ray diagram for refraction through prism.
- g. Define Critical angle.
- h. What is Optical Fibre ?
- i. Define ground waves.
- j. Define Unit Charge.
2. Answer **Any Six** Questions 5 x 6
- a. Check the correctness of the physical equation : $S = ut + \frac{1}{2}at^2$.
- b. Write down the properties of Ultrasonics.
- c. State and explain Newton's law of gravitation.
- d. Compare Fleming's Left-hand rule and Right hand Rule.
- e. Write down properties of magnetic lines of force.

- f. State and explain Kirchhoff's Laws.
- g. State Faraday's Laws of Electromagnetic Induction.

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| 3 | Derive expressions for (i) Velocity and (ii) Acceleration of a particle executing S.H.M. | 7+3 |
| 4 | Establish a relation between co-efficient of linear expansion (α), co-efficient of superficial expansion (β), and co-efficient of cubical expansion (γ) of a material. | (10) |
| 5 | Obtain expressions for (i) Time of flight and (ii) Horizontal range, for a projectile projected with initial velocity 'u', by making an angle ' θ ' with the horizontal. | 5+5 |
| 6 | (i) State laws of limiting friction .
(ii) Explain different methods to reduce friction. | (5+5=10) |
| 7 | Write short notes on:
i. Difference between Heat and Temperature.
ii. Properties of LASER. | (5+5=10) |