



R20 Regulation

Subject code: 3B1AC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech I Semester Supplementary Examinations, March/April 2023

Engineering Physics

(Common to CE & ME)

Maximum Marks: 70

Date: 10.04.2023 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

1. Write about mechanical impedance.
2. Write critical damping in damped mechanical harmonic oscillator?
3. What is transverse wave?
4. What is the ratio of fundamental harmonic and the overtones emitted by a closed pipe?
5. Define interferometers & its basic principle?
6. Define destructive interference.
7. Write about Fraunhofer diffraction.
8. Define diffraction.
9. Write the components of laser.
10. Write about the structure of optical fiber.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 (a) Obtain the generalized equation for damped harmonic oscillator. (5M)
(b) Derive the expression for electrical harmonic oscillator? (5M)
OR
- 12 What is forced harmonic oscillator? Derive its equation of motion. (10M)
- 13 (a) Derive the Sabine formula? (7M)
(b) A hall has dimensions $20 \times 15 \times 5 \text{ m}^3$. The reverberation time is 3.5 sec. Calculate the total absorption of its surfaces & the average absorption coefficients. (3M)
OR
- 14 Derive an equation for a Transverse wave in a string. (10M)
- 15 Explain the formation of Newton's rings and obtain equation for diameter of dark and bright.
(10M)
OR
- 16 Describe the construction and working of a Mach Zehnder Interferometer? (10M)
- 17 With help of a neat diagram, demonstrate the Powder method. (10M)
OR

- 18 (a) Describe the Fraunhofer diffraction pattern due to single slit. (6M)
(b) Write about the resolving power of a grating? (4M)
- 19 (a) With the help of suitable diagrams, Explain the construction and working of a ruby laser. (6M)
(b) Write the Characteristics of lasers. (4M)
- OR
- 20 What is numerical aperture of a fibre? Obtain an expression for numerical aperture. (10M)