

**Vivekananda College of Engineering & Technology, Puttur**  
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CRM08

Rev 1.9

<BS>

<19/11/2019>

**CONTINUOUS INTERNAL EVALUATION - 2**

|                 |                           |                            |                |
|-----------------|---------------------------|----------------------------|----------------|
| Dept:FY         | Sem /<br>Div:I/A,B,C      | Sub:Engineering<br>Physics | S Code:18PHY12 |
| Date:23/11/2019 | Time: 3:00pm to<br>4:30pm | Max Marks: 50              | Elective:N     |

Note: Answer any 2 full questions, choosing one full question from each part.

| QN            | Questions  | Mar<br>ks | RBT        | CO |
|---------------|--|-----------|------------|----|
| <b>PART A</b> |  |           |            |    |
| 1             | a Give four Maxwell's equation in differential form in vacuum and hence derive the electromagnetic wave equation in terms of electric field using Maxwell's equations.                                 | 10        | L2         | CO |
|               | b Describe the concept of Divergence. What is its physical significance? Derive Gauss' divergence theorem.   | 10        | L1 &<br>L2 | CO |
|               | c A coil of mean radius 8cm and having 100 turns carries current of 10A. Calculate the magnetic field produced at the center of the coil and at a point on the axis at a distance 4cm from the center. | 5         | L3         | CO |
| <b>OR</b>     |  |           |            |    |
| 2             | a With neat diagram explain the different types of optical fibers and mention the merits of optical fiber communication.   | 10        | L2         | CO |
|               | b Explain attenuation mechanism .With the help of block diagram, explain point to point communication using optical fiber.   | 10        | L2         | CO |
|               | c The attenuation in an optical fiber is 3.6dB/km. What  | 5         | L3         | CO |

|  |  |   |  |  |  |
|--|--|---|--|--|--|
|  |  | fraction of its initial intensity remains after i)1 km,ii) after 3km? |  |  |  |
|--|--|---|--|--|--|

**PART B**

|   |   |   |    |         |     |
|---|---|---|----|---------|-----|
| 3 | a | State and explain de Broglie's hypothesis. Derive an expression for de Broglie wavelength of an accelerated electron.                         | 10 | L2      | CO3 |
|   | b | State and explain Heisenberg's Uncertainty principle, show that electrons do not exist inside the nucleus.                                    | 10 | L1 & L2 | CO3 |
|   | c | An electron has a speed of 100m/s. The inherent uncertainty in its measurement is 0.005%. Find the corresponding uncertainty in its position. | 5  | L3      | CO3 |

**OR**

|   |   |  |    |         |     |
|---|---|--|----|---------|-----|
| 4 | a | Derive an expression for displacement current and write condition for three types of polarization of Electromagnetic waves.              | 10 | L2      | CO2 |
|   | b | Define angle of acceptance and numerical aperture. Drive an expression for Numerical aperture also arrive the condition for propagation. | 10 | L1 & L2 | CO2 |
|   | c | A particle of mass $0.5\text{MeV}/c^2$ has kinetic energy 100 eV. Find its de Broglie wavelength, where c is the velocity of light.      | 5  | L3      | CO3 |

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19/11/19.

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19/11/19

HOD: Dr. Mahesh K K