

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSC/MSC/PRE-PHD
BRANCH: PHYSICS

SEMESTER : IX / III
SESSION : MO/2022

SUBJECT: PH503 LASER PHYSICS AND APPLICATIONS

TIME: 3:00 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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| Q.1(a) | Compare between spontaneous and stimulated emission. [CO1, BTIV] | [5] |
| Q.1(b) | Develop rate equation for 3 level laser system. [CO1, BTVI] | [5] |
| Q.2(a) | Distinguish between stable and unstable resonator with stability curve diagram. [CO2, BTIV] | [5] |
| Q.2(b) | Explain transverse and longitudinal modes in a laser system. [CO2, BTII] | [5] |
| Q.3(a) | Explain different techniques involved in Q switching method in a laser. [CO3, BTV] | [5] |
| Q.3(b) | Distinguish between Q switching and mode locking. [CO3, BTVI] | [5] |
| Q.4(a) | Explain the working principle of He-Ne laser with suitable diagram. [CO4, BTII] | [5] |
| Q.4(b) | Explain the working of dye laser. [CO4, BTV] | [5] |
| Q.5(a) | Outline some of the advantages of lasers as a source in communication system. [CO5, BTII] | [5] |
| Q.5(b) | What is holographic non-destructive testing? [CO5, BTI] | [5] |

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