

GANPAT UNIVERSITY
B.TECH SEM. VII BIOMEDICAL & INSTRUMENTATION ENGINEERING
CBCS REGULAR EXAMINATION NOVEMBER 2014
2BM704: LASER & FIBER OPTICS IN MEDICINE

TIME: - 3 HOURS

TOTAL MARKS: - 70

INSTRUCTION: - 1. Write the answer of each section in separate answer sheet.

2. Figure to the right indicates full marks.

3. Assume suitable data if necessary.

SECTION-I

Que-1 12

- (a) What is attenuation in fiber? Explain it briefly.
 (b) Explain Modal dispersion and suitable remedial action.

OR

Que-1 12

- (a) Give classification of fibers w.r.t to Modes and their Refractive index profile.
 (b) Give difference between PN, PIN, and APD photo detectors.

Que-2 11

- (a) Give classification of fiber based chemical sensor.
 (b) 1. Give the difference between Spontaneous emission and stimulated emission.
 2. Give the difference between VAD and OAD.

OR

Que-2 11

- (a) Explain Extrinsic and intrinsic Fiber Optical Chemical Sensors.
 (b) Explain MCVD process in detail

Que-3 12

- (a) What is relationship with bandwidth and dispersion?
 (b) What is difference between step index fiber and graded index fiber?
 (c) Give comparison of different fiber manufacturing processes.

SECTION-II

Que-4 12

- (a) Explain different arrangement for dye laser.
 (b) Explain different pumping mechanism.

OR

Que-4 12

- (a) Explain Optical Resonator and Optical Amplifier.
 (b) Give difference between Hetrogeneous and Double-Hetrogeneous structure of Semiconductor Laser.

Que-5 11
(a) Explain CO₂ Laser with energy diagram of CO₂ and N₂.
(b) Explain Excimer laser.

OR

Que-5 11
(a) Explain Plasma Induced ablation and Photoablation.
(b) Discuss various hazards of LASER.

Que-6 12
(a) What is fundamental difference between LED and Laser? Also compare their characteristics.
(b) Explain electron arrangement mechanism w.r.t. different interactions.
(c) Enlist material used for Solid State laser and Dye laser with their advantages.

Best of Luck