University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

Examinations Commencing from 28 June 2022 to 14 July2022

Program: **ALL**

Curriculum Scheme: Rev2016

Examination: FE Semester II

Course Code: FEC202 and Course Name: Applied Physics-II

Time: 2 hour Max. Marks: 60

Q1. (12 marks)	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks - 2 marks each**
1.	The penetration of waves into the regions of the geometrical shadow is
Option A:	Interference
Option B:	Diffraction
Option C:	Polarization
Option D:	Dispersion
2.	Holography records
Option A:	Interference
Option B:	Diffraction
Option C:	Amplitude and phase
Option D:	Wave length
3.	The numerical aperture of a fiber with core refractive index n_1=1.61 & cladding index n_2=1.55 is
Option A:	0.235
Option B:	0.435
Option C:	0.123
Option D:	0.534
4.	---------- transformation are replaced by the Lorentz transformation which confirms the postulate of relativity
Option A:	Galilean
Option B:	Maxwell
Option C:	Planck's
Option D:	Newton's
5.	Which of the following is not an example of bottom-up approach for the preparation of nanomaterial's
Option A:	Sol-Gel
Option B:	Molecular self-assembly
Option C:	Mechanical grinding
Option D:	Chemical Vapour Deposition
6.	An example of magneto static focusing is
Option A:	Electron microscope
Option B:	Electron gun
Option C:	Anode
Option D:	Cathode

Q2 (16Marks)	**Solve any Four out of Six** **4 marks each**
A	Define Resolving Power? Obtain expression for resolving power of grating.
B	Calculate the angle at which the first dark band and next bright band are observed in Fraunhofer diffraction pattern due to a 0.3mm wide slit for wavelength 5890A.
C	Explain construction and working of resonant cavity in the operation of laser.
D	Explain the construction and working of a Transmission Electron microscope with a schematic diagram.
E	Write expression for divergence of a vector quantity and explain its significance.
F	State Maxwell's all four equations and give the significance of each.

Q3. (16 Marks)	**Solve any Four out of Six** **4 marks each**
A	Prove that in Newton's ring experiment radius is dark ring is proportional to square root of natural number.
B	In Newton's rings experiment the diameter of 10^{th} ring on reflection reduces from 1.40 to 1.27 cm when a liquid is introduced between the lens and the plate. Find the refractive index of the liquid
C	What is mode of propagation? Distinguish between single mode & multimode propagation?
D	With neat block diagram explain construction and working of CRO.
E	What is curl of a vector? Explain its significance
F	Draw the schematic diagram of Scanning Electron Microscope and explain its construction, working, advantages, disadvantages and applications.
Q4. (16 Marks)	**Solve any Four out of Six** **4 marks each**
A	Explain the construction and working of He -Ne laser with energy level diagram?
B	Find gradient of scalar field $A=3x^2y-y^3z^3$ at point (1,-2.-1)
C	Write short note on electrostatic focusing & Magneto static focusing
D	Describe any two methods to synthesize Nanomaterial's
E	What is the highest order spectrum, which may be seen with monochromatic light of wavelength 6000 A° by means of a diffraction grating with 5000 lines/cm?
F	Explain the thin film as highly-reflection coating.