Program: FE (All Branches)

Curriculum Scheme: Revised 2012

Examination: First Year Semester II

Course Code: FEC 202 **Course Name: Applied Physics II**

Time: 1 hour Max. Marks: 50

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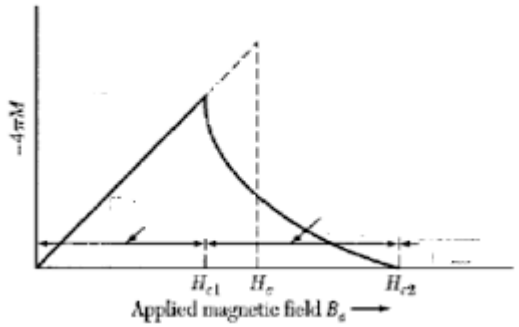
Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Find the thickness of the soap film which appears yellow (λ =5896 A^o) in reflection when it is illuminated by white light at an angle of 45^o. Given refractive index of the film =1.33
Option A:	1250 A^o
Option B:	1600 A^o
Option C:	**1308 A^o**
Option D:	2000 A^o
Q2.	SQUID is an application of
Option A:	Semiconducting materials
Option B:	Nano material
Option C:	**Superconducting materials**
Option D:	Bio materials
Q3.	Calculate the acceptance angle for an optical fibre. Given that the refractive indices of the core and the cladding are 1.45 and 1.40 respectively.
Option A:	**22.17^o**
Option B:	10.55^o
Option C:	40.66^o
Option D:	35.56^o
Q4.	Find the missing order for a double-slit Fraunhofer Diffraction pattern if the slit widths are 0.2 mm separated by 0.6 mm.
Option A:	1st, 5th, 9th, ….
Option B:	2nd, 6th, 10th, …
Option C:	3rd, 7th, 11th, ….
Option D:	**4th, 8th, 12th, …**
Q5.	To prepare nanomaterials, which approaches are used in nanotechnology
Option A:	Right down approach
Option B:	Top down approach
Option C:	Bottom up approach
Option D:	**Both B & C**

Q6.	Calculate the minimum number of lines required on a grating that can just resolve the tow sodium lines λ_1 =5890 A^o and λ_2 =5893 A^o
Option A:	**Minimum of 328 lines required**
Option B:	Minimum of 250 lines required
Option C:	Minimum of 200 lines required
Option D:	Minimum of 150 lines required
Q7.	An electron has a speed of 400 m/s with uncertainty of 0.01%. Find the accuracy in its position.
Option A:	2.9×10^{-5} m
Option B:	2.9×10^{-2} m
Option C:	**2.9×10^{-3} m**
Option D:	2.9 m
Q8.	Lissajous figures are the _____ patterns traced by the electron beam acted upon by two mutually perpendicular _____ signals
Option A:	Amplitude, cosine
Option B:	Position, standing
Option C:	Frequency , deflection
Option D:	**Displacement, sinusoidal**
Q9.	Fringes of equal thickness are observed in a thin glass wedge of refractive index 1.52. The fringe spacing is 1mm and wavelength of light is 5893 A^o . Calculate the angle of wedge.
Option A:	0.0190 degree
Option B:	**0.0111 degree**
Option C:	0.0050 degree
Option D:	0.0120 degree
Q10.	By observing the diffraction patter, the two images are said to be just resolved when _____
Option A:	The central maxima of one image coincide with central maxima of the other
Option B:	The central maxima of one do not coincide with central maxima of the other
Option C:	**The central maxima of one image coincides with the first minimum of the other**
Option D:	The central maxima of one image do not coincide with the first minimum of other
Q11.	Which of the following are true for electron microscopy?
Option A:	specimen should be thin and dry
Option B:	image is obtained on a phosphorescent screen
Option C:	electron beam must pass through evacuated chamber
Option D:	**specimen should be thin and dry, image is obtained on a phosphorescent screen and electron beam must pass through evacuated chamber**
Q12.	Non-existence of electrons in a nucleus is an application of

Option A:	Time independent Schrodinger equation
Option B:	**Heisenberg uncertainty principle**
Option C:	De-Broglie hypothesis
Option D:	Time dependent Schrodinger equation
Q13.	What is the need to achieve population inversion?
Option A:	**To excite most of the atoms**
Option B:	To bring most of the atoms to ground state
Option C:	To achieve stable condition
Option D:	To reduce the time of production of laser
Q14.	What will be the order of the dark ring which will have double the diameter of the 40^{th} dark ring?
Option A:	60
Option B:	**160**
Option C:	56
Option D:	100
Q15.	In an optical fiber, the concept of numerical aperture is applicable in describing the ability of _____
Option A:	**Light Collection**
Option B:	Light Scattering
Option C:	Light Dispersion
Option D:	Light Polarization
Q16.	C.R.O gives _____
Option A:	actual representation
Option B:	**visual representation**
Option C:	approximate representation
Option D:	incorrect representation
Q17.	In the region between H_{c1} and H_{c2} the material is magnetically in mixed state but electrically in a superconducting state 

Option A:	Superonducting state
Option B:	Normal state
Option C:	**Vortex state**
Option D:	Actual state
Q18.	The thickness and the refractive index of the anti-reflecting coating film are determined by
Option A:	Phase condition
Option B:	Amplitudes condition
Option C:	**Option A & B**
Option D:	Testing the surface condition
Q19.	The signal attenuation or loss in an optical fiber is 2 dB/km. Calculate the mean optical power launched into the fibre of length 1 km,if the mean optical power at the fiber is 20 µW.
Option A:	25.6µW
Option B:	**31.7 µW**
Option C:	69 µW
Option D:	25 µW
Q20.	Determine the magnetic field required to bend a beam consisting of electrons of speed 3×10^7 m/s in a circle of radius 5 cm.
Option A:	2.5×10^{-3} wb/m^2
Option B:	$1.5x\ 10^{-3}$ wb/m^2
Option C:	**3.4×10^{-3} wb/m^2**
Option D:	4.6×10^{-3} wb/m^2
Q21.	Which among the following helps us in getting a three-dimensional picture of the specimen?
Option A:	Transmission Electron Microscope
Option B:	**Scanning Electron Microscope**
Option C:	Compound Microscope
Option D:	Simple Microscope
Q22.	Find the lowest energy of a neutron within a nucleus of dimension 10^{-14}m given mass of a neutron= 1.97×10^{-27} kg
Option A:	**3.29×10^{-13} J**
Option B:	6.50×10^{-13} J
Option C:	1.50×10^{-13} J
Option D:	4.60×10^{-13} J
Q23.	He-Ne Laser is _____ lasing scheme.
Option A:	**Four level**
Option B:	Three level
Option C:	Two level
Option D:	One level

Q24.	In a Newton's rings experiment, the diameter of 5^{th} dark ring is 0.336 cm .find the radius of curvature of the plano-convex lens if the wavelength of light used is 5890 A^{o}
Option A:	**45.84 cm**
Option B:	56.50 cm
Option C:	30.25 cm
Option D:	15.20 cm
Q25.	Matter waves travels
Option A:	With the same speed of light
Option B:	**Faster than light**
Option C:	Slower than light
Option D:	None of the above