PRN. No.

PAPER CODE   0114-304A CBack

December 2024 Sem-I backlog exam

F.Y./S.Y./T.Y./BTECH. (COMPUTER ENGINEERING)

(PATTERN 2020)

COURSE NAME: Engineering Physics
COURSE CODE: ES10204A

[Max. Marks: 60]

Time: [2Hr]

(*) Instructions to candidates:
1) Use of scientific calculator is allowed
2) Use suitable data where ever required
3) All questions are compulsory. Solve any THREE sub questions from EACH question

Que. No.	Question Description	Max. Marks	CO mapped	BT Level
Q1.	Solve any three sub questions from the following			
	A) Explain forced oscillations? Obtain an expression for the amplitude of forced oscillator and give the condition for amplitude resonance?	[5]	1	Evaluate
	B) Describe Energy damped harmonic oscillator?	[5]	1	Understanding
	C) Describe the amplitude & phase of forced vibrations?	[5]	1	Understanding
	D) The amplitude of a second pendulum falls to half initial value in 150 sec. Calculate the Q- factor?	[5]	1	Evaluate
Q2.	Solve any three sub questions from the following			
	A) Starting from the probability distribution function, show that the probability of finding an electron with energy $E_F + \Delta E$ is equal to probability of absence of an electron with energy $E_F - \Delta E$. For p-type GaAs with a band gap of 1.424 eV, if $E_{Fi} - E_{Fp} = 0.32\ eV$, then calculate $E_{Fp} - E_v$.	[5]	2	Application
	B) Explain the working of zero biased and forward biased diode on the basis of neatly labeled energy level diagrams. Derive the expression for Vbi.	[5]	2	Understanding
	C) Evaluate the relationship between band theory and density of states. Consider the role of internal electron diffraction and explain how it opens the band gap.	[5]	2	Evaluate
	D) Explain the band structure of unbiased p-n junction diode and analyse its working principles.	[5]	2	Understanding

Q3.	Solve any three sub questions from the following			
	A) With the help of a schematic graph of attenuation versus wavelength for an optical fiber, explain the role of different absorption and scattering mechanisms in attenuation.	[5]	3	Understanding
	B) A 20 km long optical fiber is used to transmit data which has an attenuation coefficient of 1dB/km. If an optical signal of 8mW is launched into the fiber, what is the output power? What is the total attenuation in dB? If the length of the optical fiber is doubled, what will be the output power?	[5]	3	Application
	C) Discuss the concept of intermodal dispersion and compare multi-mode step refractive index with multi-mode graded refractive index in optical fibers.	[5]	3	Understanding
	D) What are optical fibers? Distinguish between step index optical fiber and graded index optical fiber.	[5]	3	Understanding
Q4.	Solve any three sub questions from the following			
	A) What is holography? Explain recording of a hologram using laser.	[5]	4	Understanding
	B) Discuss the concept of LASER with its important characteristics.	[5]	4	Understanding
	C) Explain the construction and working of a Single Hetero-junction laser	[5]	4	Understanding
	D) Explain the construction and working of an Optical Fiber Laser	[5]	4	Understanding