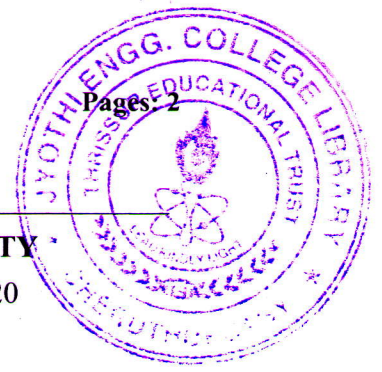**F**

Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Seventh semester B.Tech examinations (S), September 2020

Course Code: EC469

Course Name: OPTOELECTRONIC DEVICES

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.   Marks

1	a)	Explain the different types of absorption mechanisms in semiconductors with neat figures.	(10)
	b)	Differentiate between Franz-keldysh and Stark effects.	(5)
2	a)	Write short notes on Tunneling based lasers.	(7)
	b)	Explain the threshold condition for lasing with mathematical support.	(8)
3	a)	Breifly explain Auger recombination in semiconductors with neat sketches.	(7)
	b)	Distinguish between axial and transverse laser modes.	(8)

PART B
Answer any two full questions, each carries 15 marks.

4	a)	Explain the working of Raman-Nath modulator with neat diagrams.	(8)
	b)	Explain the principle of white light LED, based on phosphor converters.	(7)
5	a)	Describe the structure and working of InGaN/GaN laser diodes.	(10)
	b)	Discuss the applications of nitride light emitters.	(5)
6	a)	Explain Franz-Keldysh/Stark electro-absorption modulators.	(8)
	b)	Write short notes on optical memory.	(7)

PART C
Answer any two full questions, each carries 20 marks.

7	a)	Elucidate working principle of organic LEDs. Mention the properties of material used.	(10)
	b)	Explain the different types of directional couplers used for optical field access with figures.	(10)
8	a)	With neat figures, explain the different types of Wavelength division multiplexer and demultiplexer used for optical field access.	(10)
	b)	Explain the illumination geometry of microcavity photodiode.	(10)

9 a) Elucidate the working principle of optical Add/Drop multiplexors used in optical field access   (10)

   b) Write short notes on Polymer LED.   (5)

   c) The quantum efficiency of a RAPD is 80% for detection of radiation at a wavelength of 0.9μm.When incident optical power is 0.5μW, the output current of the device is 11μA.Determine the multiplication factor of the photodiode under this condition.   (5)

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