Enrollment No: _____   Exam Seat No: _____

C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name: Applied physics
Subject Code: 4TE02APH1   **Branch: B. Tech. (All)**

Semester: II   Date: 20/11/2015   **Time: 10:30 To 1:30**   **Marks: 70**

Instructions:
  (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  (2) Instructions written on main answer book are strictly to be obeyed.
  (3) Draw neat diagrams and figures (if necessary) at right places.
  (4) Assume suitable data if needed.

Q-1	**Attempt the following questions:**	**(14)**
a)	What is full form of LASER?	01
b)	Write down full form and symbols of LED.	01
c)	Define peak inverse voltage.	01
d)	Draw V-I Characteristic of P-N Junction diode.	01
e)	Gives the types of transistor with its symbol.	01
f)	Give definition of Holography.	01
g)	Define core and cladding in optical fiber cable.	01
h)	Define critical angle of propagation in fiber optics.	01
i)	Define pinch-off voltage of JFET.	01
j)	The refractive index of core and cladding materials of optical fiber are 1.54 and 1.5 respectively. Calculate the numerical aperture of the optical fiber.	01
k)	What is pumping Process in laser?	01
l)	Define Extrinsic Semiconductor.	01
m)	What is Zener Diode?	01
n)	Define stimulated emission of radiation.	01

Attempt any four questions from Q-2 to Q-8

Q-2	**Attempt all questions**	**(14)**
a)	Explain the construction and V-I characteristics of FET	**05**
b)	Explain in details breakdown mechanism of zener diode.	**05**
c)	Explain in brief: Working of a P-N-P transistor.	**04**
Q-3	**Attempt all questions**	**(14)**
a)	Explain in details, construction, working, and application of Light emitting diode.	**06**
b)	Explain in details CE configuration.	**05**
c)	What is ripple factor? Show that for a half wave rectifier $r > 1$.	**03**
Q-4	**Attempt all questions**	**(14)**
a)	Write a short note on Mass Action Law of Semiconductor.	**05**
b)	Write a short note on Tunnel Diode.	**05**

	c)	Explain the construction of Capacitor filter.	**04**
Q-5		**Attempt all questions**	**(14)**
	a)	Explain in details principle, construction, working, V-I characteristic and application of Photo diode.	**05**
	b)	What is acceptance angle for optical fiber? Derive an expression for acceptance angle of the optical fiber.	**06**
	c)	In a common base connection the current amplification factor is 0.9. If the emitter current is 1mA, determine the value of base current.	**03**
Q-6		**Attempt all questions**	**(14)**
	a)	Explain in details Extrinsic semiconductor.	**05**
	b)	What are Einstein's coefficients? Derive the relation between Einstein's coefficients A and B. prove that the ratio of spontaneous emission and stimulated emission is proportional to the cube of frequency.	**06**
	c)	Explain in details construction and working of full wave Bridge rectifier.	**03**
Q-7		**Attempt all questions**	**(14)**
	a)	Explain in details single mode optical fiber and multimode optical fiber.	**05**
	b)	Explain the method of construction and reconstruction of a Hologram in details.	**05**
	c)	Give application of LASER.	**04**
Q-8		**Attempt all questions**	**(14)**
	a)	Gives classification of optical fiber according to refractive index.	**05**
	b)	Explain in details construction, working and application of Nd-YAG laser	**05**
	c)	Discuss advantages of optical fiber cable over metallic cable.	**04**