Hall Ticket Number :										

R-11 / R-13

Code: 1G311

B.Tech. I Year Supplementary Examinations Nov/Dec 2019

Electronic Devices and Circuits

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

****

1.	a)	What do mean by drift current? What is the total current density due to holes and electrons in intrinsic semiconductor?	8M
	b)	What are the characteristics of metals, insulators and semiconductors?	6M
2.	a)	What is Zener breakdown and avalanche breakdown?	7M
	b)	What are the applications of semiconductor diode?	7M
3.	a)	What is a rectifier?	2M
	b)	Classify the different rectifiers? Explain each of them with necessary diagrams	10M
4.		Draw a circuit to determine the input and output characteristics of common emitter configuration and determine the approximate operating point on the characteristics for faithful amplification.	14M
5.		With necessary arrangements derive a voltage divider circuit and explain the operation.	14M
6.	a)	Distinguish between enhancement mode and depletion mode MOSFETS	7M
	b)	Draw the static characteristics of a MOSFET and explain.	7M
7.		Obtain the h parameters of a common collector transistor amplifier and derive the approximate equations	14M
8.	a)	What is meant by latching?	4M
	b)	What are the applications of opto-isolators? Explain any one of them	10M

***

Hall Ticket Number :										

R-11 / R-13

Code: 1GC12

B.Tech. I Year Supplementary Examinations Nov/Dec 2019

Engineering Physics

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

****

1.	a)	Define interference and explain conditions of constructive and destructive interference	7M
	b)	Describe the theory of Newton's rings experiment	7M
2.	a)	Define space lattice, basis and unit cell	7M
	b)	Describe seven crystal systems with neat diagrams	7M
3.	a)	Derive Schrödinger's time independent wave equation	7M
	b)	describe importance of Schrödinger's wave equation	7M
4.	a)	Compare direct and indirect band gap semiconductors	7M
	b)	Outline the working of LCD	7M
5.		Explain ionic, electronic and orientation polarizations	14M
6.	a)	Define superconductivity and write general properties	7M
	b)	Explain Meissner's effect in superconductors	7M
7.	a)	Explain the principle of working of optical fiber	7M
	b)	Write a note on optical fiber communication system	7M
8.	a)	Elaborate CNT's construction and properties	7M
	b)	summarize the CNT's in technology	7M

***

Hall Ticket Number :										

R-11 / R-13

Code: 1GC14

B.Tech. I Year Supplementary Examinations Nov/Dec 2019

Mathematics-I

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

****

1. a) Solve $(x+1)\frac{dy}{dx} - y = e^{3x}(x+1)^2$. 7M

   b) The rate at which bacteria multiply is proportional to the instantaneous number present. If the original number doubles in 2 hours, in how many hours will it be triple? 7M

2. Solve $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = (1-e^x)^2$ 14M

3. Prove that if 0<a<b<1, $\frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$. Hence show that $\frac{®}{4} + \frac{3}{25} < \tan^{-1}\frac{4}{3} < \frac{®}{4} + \frac{1}{6}$. 14M

4. a) Trace the curve $y^2(2a-x) = x^3$ 7M

   b) Trace the curve $x^3 + y^3 = 3axy$ 7M

5. Evaluate $\iint xy(x+y)dxdy$ over the area between $y=x^2$ and $y=x$. 14M

6. a) Find the Laplace transform of $\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^3$ 7M

   b) Find the Laplace transform of $t^2 \sin at$ 7M

7. Solve $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} - 3y = \sin t, y = \frac{dy}{dt} = 0$ *when* $t = 0$. 14M

8. Find div $\overline{F}$ and Curl $\overline{F}$ when $\overline{F} = grad(x^3 + y^3 + z^3 - 3xyz)$. 14M

***