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)

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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

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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)

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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

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