AR19

CODE: 19MCC1001 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular Examinations, Jan/February, 2020

RESEARCH METHODOLOGY AND IPR
(Common to all Specializations)

Time: 3 Hours **Max Marks:60**

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Discuss in detail about different phases of research process with a neat diagram.	8M
	b)	Explain about the Motivation in Research.	4M
2.	a)	Illustrate the Problems Encountered by Researchers in India	6M
	b)	Describe the criteria of Good Research.	6M
3.	a)	Elucidate the types of literature used in research.	6M
	b)	How do you develop a conceptual framework in research process?	6M
4.	a)	Illustrate the significance of Report Writing	6M
	b)	Depict the types of Reports.	6M
5.	a)	Explain the of Process of Patenting.	6M
	b)	Describe Patenting under Patent Cooperation Treaty (PCT).	6M
6.	a)	Discuss about IPR of Biological Systems.	6M
	b)	Articulate the Licensing and transfer of technology.	6M
7.	a)	Examine the Patent information and databases.	6M
	b)	Give an example to explain Misappropriation right of publicity.	6M
8.	a)	Discuss the importance of literature survey & review in design a research project	6M
	b)	Illustrate in detail about the concept of patent searching process.	6M

AR16

CODE: 16MVL1006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Supplementary Examinations, Jan / February-2020

SEMICONDUCTOR DEVICES MODELLING
(DECS)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) The intrinsic Fermi level is very close to the midpoint between the conduction band and valance band. Justify the statement?
   (b) Explain about Fermi level in Extrinsic silicon.

2. (a) Illustrate the effect of built in potential and applied potential in p-n junction.
   (b) Explain the charge distribution on a p-i-n diode.

3. (a) Explain the terms Flat band and Accumulation with neat diagrams.
   (b) Illustrate the effect of oxide trapped charge in SiO_2.

4. (a) Explain the working of one-dimensional transistor with energy-band diagram at quasi-neutral region.
   (b) Derive the expression for current-density equation for electrons in a p-type base.

5. (a) Discuss the MOSFET I-V characteristics in triode and saturation region.
   (b) Derive the expression for threshold current as a function of V_g in MOSFET

6. (a) Illustrate the method to distribute gate-channel capacitance using Meyer model.
   (b) Explain the effect of C_{GS} and C_{DS} as a function of V_{gs} for different V_{ds} in Long-channel charge model.

7. (a) Explain the terms i) shallow or transparent emitter. ii)current gains
   (b) Illustrate the ideal I_C versus V_{CE} characteristics of an n-p-n transistor.

8. (a) Explain the effect of capacitance and inversion layer capacitance in MOSFET.
   (b) Explain the effect of carrier mobility in MOSFET channel.

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AR16

CODE: 16MSE1007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Supplementary Examinations, Jan / February-2020

OPTIMIZATION IN STRUCTURAL DESIGN
(Structural Engineering)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Discuss in brief about the areas of applications of optimization in various fields of Engineering.
   (b) Write a detailed note on the history and development of optimization.
2. (a) State and explain the characteristics that distinguish the linear and nonlinear programming problems.
   (b) Discuss in brief about the areas of applications of optimization in various fields of Engineering.
3. (a) How do you classify optimization problems based on the nature of design variables?
   (b) Use the Kuhn-Tucker conditions to solve the following problem
   Maximize $Z = 2x_1^2+12x_1x_2-7x_2^2$
   Subject to $2x_1+5x_2 \leq 98$
   $X_1, X_2 \geq 0$
4. What do you understand by one dimensional optimization problems? Discuss the analytical method of finding their solutions.
5. Describe the algorithm of the quadratic interpolation technique. Also, Discuss the Fibonacci and its effectiveness with regard to solving one dimensional non linear programming problems.
6. (a) Differentiate between the interior and exterior penalty function methods.
   (b) Use the exterior penalty function method to
   maximize $f = -2x_1^2-3x_2^2-x_1-x_2$
   subject to $g(x_1) = 15-3x_1 \leq 0$ and $g(x_2) = -x_2 \leq 0$
7. (a) Discuss about the merits of the Two-phase Method over the Big-M Method
   (b) Minimize $Z= x_1-x_2-2x_3$
   Subject to $3x_1+x_2+3x_3 \leq 7$
   $-x_1+2x_2 \geq -6$
   $4x_1+3x_2+5x_3 \leq 10$
   $x_1, x_2, x_3 \geq 0$
8. (a) Discuss the Wolfe's method for solving a quadratic programming problem.
   (b) How is the degree of difficulty defined for a constrained geometric programming problem?