F 3531 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch—Electronics and Communication Engineering

APPLIED ELECTROMAGNETIC THEORY (L)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. State and explain Coulomb's law of point charges.
2. What are scalar and vector potentials ?
3. State Helmholtz theorems. Write Helmholtz Integrals.
4. Differentiate electric dipole from magnetic dipole.
5. What are constitutive relations ? Write the equations.
6. Define and explain polarization. Explain the types of polarization.
7. Explain the characteristics of the waves.
8. What is dominant mode in rectangular waveguide ? Explain.
9. What are low frequency and high frequency transmission lines ? Explain. Give examples.
10. Define and explain phase and group velocities ? Write the relation among them.

(10 × 4 = 40 marks)

Part B

11. State and derive Divergence theorem and Stokes theorem.

Or

12. Derive an expression to calculate the capacitance between coaxial cylinders.
13. Calculate the Inductance of solenoid and Toroid.

Or

14. Explain the significance of Electric and magnetic boundary conditions with examples.
15. Obtain Maxwell's equations in Intergral and differential terms.

Or

16. State and derive Poynting theorem.

Turn over

17. Derive the characteristic equations of TE waves in Rectangular wave guides.

Or

18. Discuss the various methods of excitation in a rectangular waveguide with neat sketches.

19. Derive standard transmission line equations.

Or

20. Write technical notes on :

    (a) Skin effect. (4 marks)

    (b) VSWR. (4 marks)

    (c) Stub matching. (4 marks)

[5 × 12 = 60 marks]

F 3557 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch : Electronics and Communication/Electronics and Instrumentation

MICROPROCESSORS AND MICROCONTROLLERS (L, S)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Describe the use of program counter in 8085.
2. What are the flags available in 8085 ? Briefly explain each.
3. Explain ideal mode of 89C51.
4. What is meant by flash programming ?
5. Explain the Boolean instructions and branching instructions with example.
6. Define program memory and data memory.
7. Briefly explain interrupt sources.
8. Explain the structure of port I of 89C51.
9. What is meant by TMCD, TCON in 89C51 ?
10. What are the different baud rates available for serial communication ?

(10 × 4 = 40 marks)

Part B

11. Draw and explain the internal architecture of 8085. (12 marks

Or

12. Write notes on memory decoding. (12 marks

13. (a) Explain the function of any *four* 89C51 pins. (8 marks

    (b) Describe the function of power control register. (4 marks

Or

14. Write notes on :

    (a) Program protection modes (b) Flash programming.

(6 + 6 = 12 mark

Turn ove

15. (a) Write a program to add 7.BCD numbers stored in RAM location starting from 60H. (6 marks)

(b) Explain various addressing modes in 98C51, (6 marks)

Or

16. Draw and explain the memory organization of 89C51. (12 marks)

17. Explain in detail Interrupt control systems and Interrupt priority. (12 marks)

Or

18. Write notes on :

(a) port bit latches and buthors. (6 marks)

(b) accessing external memory. (6 marks)

19. Draw the timing diagram of external program memory Read/Write cycle and explain. (6 + 6 = 12 marks)

Or

20. Write notes on :

(a) SCON SFR. (6 marks)

(b) I/O port timings. (6 marks)

[5 × 12 = 60 marks]

F 3516 (Pages : 3) Reg. No.....ECE.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch—Civil/Mechanical/Electrical and Electronics/Elec. and Communication/Polymer/ Applied Elec. and Instrumentation/Elec. and Instrumentation Automobile

ENGINEERING MATHEMATICS—IV (CEMLPASU)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer any **one** *question from each module.*
All questions carry equal marks.

Module I

1. (a) If $f(a) = \int_C \frac{z^2 + 7z + 1}{z - a}\, dz$ where C is the circle $x^2 + y^2 = 4$ find $f(3)$, $f'(1-i)$ and $f''(1-i)$. (10 marks)

(b) Find the Laurent's series expansion of $\frac{7z - 2}{z(z+1)(z-2)}$ in $1 < |z+1| < 3$. (10 marks)

Or

2. (a) Using contour integration, evaluate $\int_0^{2x} \frac{d\theta}{5 - 3\cos\theta}$. (10 marks)

(b) Using contour integration, evaluate $\int_{-\infty}^{\infty} \frac{x \sin x}{x^2 + a^2}\, dx$. (10 marks)

Module II

3. (a) Using Bisection method, find a real root of the equation $x^3 - 4x = 9$ correct to three decimal places. (10 marks)

(b) Using Newton's iterative method, find a real root of the equation $x^3 - 2x - 5 = 0$ correct to three decimal places. (10 marks)

Or

Turn over

4. (a) Using method of false position, find a root of the equation $xe^x = \cos x$ correct to four decimal places.

(8 marks)

(b) Using Jocobi's Iteration method, solve the system of equations :

$20x + y - 2z = 17,\ 3x + 20y - z + 18 = 0,\ 2x - 3y + 20z = 25.$

(12 marks)

Module III

5. (a) Using Taylor's series method, find $y(0.1)$ and $y(0.3)$ given that $\frac{dy}{dx} = x^2 - y$ and $y(0) = 1$.

(8 marks)

(b) Use Euler's modified method to compute $y(1.1)$, given that $\frac{dy}{dx} = x^2(1 + y)$, $y(1) = 1$ by taking $h = 0.05$.

(12 marks)

Or

6. (a) Apply Runge-Kutta method order four to find an approximate value of y at $x = 0.1$ and $x = 0.2$ if $\frac{dy}{dx} = x + y$ and $y(0) = 1$.

(10 marks)

(b) Using Milne's Predictor-Corrector method find $y(0.8)$ taking $h = 0.4$, given $\frac{dy}{dx} = y + x^2$, $y(0) = 1$.

(10 marks)

Module IV

7. (a) Find the Z-transforms of the following functions (i) $\cosh nx$; (ii) $a^n \cosh nx$. (10 marks)

(b) Define Z-transform and prove the linearity property and damping rule. (10 marks)

Or

8. (a) Use convolution theorem to evaluate (i) $Z^{-1}\left\{\frac{2}{(z-a)(z-b)}\right\}$; (ii) $Z^{-1}\left\{\left(\frac{z}{z-a}\right)^2\right\}$.

(10 marks)

(b) Solve $4u_n - u_{n+2} = 0$ given $u_0 = 0, u_1 = 2$. (10 marks)

Module V

9. (a) Use graphical method to solve the following LPP :—

Maximize $Z = 2x + 3y$

subject to the constraints :

$$x + 2y \leq 10$$
$$x + y \leq 6$$
$$x - y \leq 2$$
$$x - 2y \leq 1, \text{ with } x, y \geq 0.$$

(8 marks)

(b) Use simplex method to solve the following LPP :—

Maximize $Z = 3x + 5y + 4z$

subject to the constraints :

$$2x + 3y \leq 8$$
$$2y + 5z \leq 10$$
$$3x + 2y + 4z \leq 15$$
$$\text{and } x, y, z \geq 0.$$

(12 marks)

Or

10. (a) Describe artificial variable technique to find an initial basic feasible solution. Using Charnes penalty (Big-M) method solve the following problem :

Maximize $Z = 3x + 2y$

subject to the constraints :

$$2x + y \leq 2$$
$$3x + 4y \geq 12$$
$$\text{with } x, y \geq 0.$$

(10 marks)

(b) The distribution centres at P, Q and R have availability of 40, 20 and 40 units of product and the retail outlets at A, B, C, D and E require 25, 10, 20, 30 and 15 units respectively. The following table gives cost matrix of transporting one unit of product from the distribution centres to retail outlets. Determine the optimum distribution to minimize cost of transportation.

	A	B	C	D	E
P	55	30	40	50	40
Q	35	30	100	45	60
R	40	60	95	35	30

(10 marks)

[5 × 20 = 100 marks]

F 3522 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch—Electronics and Communication/Applied Electronics and Instrumentation

POWER ELECTRONICS (LA)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *the questions.*
Each question carries 4 *marks.*

1. Explain the significance of rating and specifications of power semiconductor devices.
2. Explain the construction of MCT.
3. State and explain free wheeling effect.
4. What is the need for filters in phase controlled rectifiers ?
5. What is Integral cycle control ? Explain.
6. Explain the difference between converter and inverter.
7. What is a chopper ? Explain its need.
8. What are step down and step up converters ?
9. What is the significance of PWM in converters ?
10. Define and explain Harmonics.

(10 × 4 = 40 marks)

Part B

11. Give an account on :
    (a) GTO.
    (b) IGBT.

(6 + 6 = 12 marks)

Or

12. Discuss in detail the history of development and power electronic devices.

Turn over

13. Explain the operation of single phase. AC to DC converter with RL load and a neat diagram.

Or

14. Explain the block schematics of SG 3524 and TL 494.

(6 + 6 = 12 marks)

15. Analyse a single phase controlled converter in detail.

Or

16. Explain the configuration of 3f controllers.

17. Analyse a step up chopper with RL load.

Or

18. Write short notes on voltage communication circuits.

19. Explain the square wave operation of converter.

Or

20. Discuss the various harmonics reduction techniques.

[5 × 12 = 60 marks]

F 3540 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch : Electronics and Communication/Applied Electronics and Instrumentation

COMPUTER ORGANISATION AND ARCHITECTURE (L, A)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What are machine control instructions?
2. Explain how floating point numbers are represented.
3. Explain the need for branch address modification.
4. What do you mean by microinstruction?
5. Write a brief note on dynamic memory.
6. What are the advantages of having memory modules?
7. What do you mean by vectored interrupts?
8. Write a brief note on I/O interface.
9. List the advantages of parallel processing.
10. Discuss about multistage networks.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Explain the design of fast adders.

Or

12. Explain about the division algorithm with examples.
13. Differentiate between hardwired and microprogrammed control unit.

Or

14. Write short notes on :

    (a) Microprogram sequencing.

    (b) Prefetching of micro instructions.

15. Discuss about semiconductor RAM memories in detail.

Or

16. Explain the different mapping techniques.

17. Discuss about DMA in detail.

Or

18. Write brief notes on :

    (a) Interrupt nesting.

    (b) Bus arbitrations.

19. Write short notes on :

    (a) Array processors.

    (b) Pipeline Architecture.

Or

20. Explain about the different interconnection networks in detail.

(5 × 12 = 60 marks)

F 3550 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch—Electronics and Communication/Applied Electronics and Instrumentation / Electronics and Instrumentation

LINEAR INTEGRATED CIRCUITS (LAS)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *the questions.*

Part A

1. Explain the need for Dual power supply for op-amp.
2. Define and explain slew rate and its effect.
3. Explain the concept of virtual ground in op-amp.
4. Explain the use of ROM in an op-amp circuit and its design.
5. Draw op-amp subtractor and derive an expression for 'Vo'.
6. Draw OP-amp sample and hold circuit. Explain its principle in detail.
7. Explain the principle of all pass filter, with a neat diagram.
8. Give an account on Switched capacitor filter.
9. Explain the features and applications of. IC voltage regulator.
10. Define and explain lock Range and capture Range.

(10 × 4 = 40 marks)

Part B

11. Draw the transfer curve and equivalent circuits of op-amp. Explain them in detail.

Or

12. Explain all possible applications of op-amp with neat sketches.
13. Draw op-amp V-I converters. Explain their principle of operations and applications.

Or

14. Draw op-amp differential amplifier with 3 Op-amp. Explain its functioning in detail.

Turn over

15. Draw Op-amp log and antilog amplifiers. Explain them. Derive expression for 'Vo'.

Or

16. Draw Op-amp Wien-Bridge oscillator. Explain its principle. Derive the condition for oscillation.

17. Explain the design details of Op-amp LPF and HPF with examples.

Or

18. Draw the functional block diagram of IC 555 timer and explain it in detail.

19. Explain the 78XX and 79XX series voltage regulators with neat sketches.

Or

20. Write short notes on :

    (a) 566 VCO chip. (4 marks)

    (b) LM 380 power amplifier. (4 marks)

    (c) PLL. (4 marks)

[5 × 12 = 60 marks]