G 2161 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Electrical and Electronics Engineering

LINEAR INTEGRATED CIRCUITS (E)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Define CMRR and slew rate. Explain their significance.
2. What are the disadvantages of open-loop configuration of OP-amp ?
3. What are the limitations of precision rectifier ?
4. What are the applications of peak detector ?
5. What are the advantages of digital voltmeter ?
6. Compare simultaneous ADC and counter type ADC.
7. Define lock range, capture range and free running frequency.
8. Explain how PLL is used for AM demodulation.
9. Explain the monostable operation of 555 timer.
10. What are the advantages of IC voltage regulators ?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Draw the block diagram of a typical op amp. Explain the functions of each block.

Or

(b) Draw and explain the circuit of a logarithmic amplifier. What are its applications ?

12. (a) Draw the circuit of a Schmidt trigger. Explain its working with characteristic curves.

Or

(b) Draw and explain the circuit of a precision rectifier.

Turn over

13. (a) Draw the circuit of a first order HPF. Derive its transfer function. Explain its working.

Or

(b) Draw and explain the circuit of a dual slop ADC.

14. (a) Explain with a block diagram the principle of operation of PLL.

Or

(b) Draw and explain the following circuits using PLL :

(i) F.M. Detector ; (ii) Frequency multiplier.

15. (a) Draw and explain the functional block diagram of 555 timer.

Or

(b) Draw and explain the functional block diagram of 723 IC.

(5 × 12 = 60 marks)

G 2133 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Electrical and Electronics Engineering

DIGITAL CIRCUITS (E)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the floating point representation of numbers with examples.
2. List the laws and theorems of Boolean algebra.
3. Explain with diagram the sourcing and sinking characteristics of TTL NAND gates.
4. What are demultiplexers ? Draw the logic diagram of a 1 – 104 demultiplexer and explain.
5. Explain with diagram a tristate buffer. What are the applications of buffers ?
6. Convert a JK flip-flop to T and D flip-flops.
7. What are the different methods to improve counter speed ? Explain.
8. Distinguish between synchronous and asynchronous counters.
9. What are the applications of shift registers ? Explain.
10. Draw the circuit of a 4-bit PIPO shift register and explain.

(10 × 4 = 40 marks)

Part B

11. (a) Explain signed binary number representation with examples. (4 marks)

(b) Simplify the following expressions and implement using logic gates :—

(i) $Y = (\bar{A} + B + \bar{C})(\bar{A} + B + D)(A + B + \bar{C})$.

(ii) $Y = ABC + \bar{A}BC + A\bar{B}C + AB\bar{C} + \bar{A}\bar{B}\bar{C}$.

(8 marks)

Or

Turn over

12. Simplify the function using Karnaugh Map and implement using NOR gates only :

$$F(A, B, C, D) = \sum_m (0, 1, 5, 7, 9, 11, 15) + \sum_d (2, 4, 10, 13).$$

(12 marks)

13. Draw the TTL NAND gate internal circuit and explain. (12 marks)

Or

14. (a) Compare the characteristics of DTL, TTL and CMOS families.

(b) Draw the logic diagram of a BCD-to-decimal decoder and explain.

(12 marks)

15. (a) What is meant by racing ? How are it be eliminated in MSJK Flip-flop ? (6 marks)

(b) Describe with circuits the J K, T and D flip-flops. (6 marks)

Or

16. Describe with circuits a MOD-10 ripple counter using CLEAR and PRESET inputs. (12 marks)

17. Desing a synchronous counter that has the following sequence : 0, 2, 3, 5, 0, ... Use JK flip-flops and desing without lockout.

Or

18. Describe with circuits the 4-bit synchronous UP-DOWN counter with wave forms.

(12 marks)

19. Desing a 4-bit self starting ring counter and explain. (12 marks)

Or

20. Describe with circuits and timing diagram the SISO, SIPO and PISO 4-bit shift registers.

(12 marks)

[5 × 12 = 60 marks]

G 2168 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Electrical and Electronics Engineering

POWER ELECTRONICS (E)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Draw the turn on and turn off characteristics of SCR and explain.
2. What are the salient features of IGBT ? How it is turned on ?
3. Explain the need for series and parallel operation of SCRs. What is string efficiency ?
4. Discuss briefly on the isolation of SCR, gate pulses.
5. What is a line commutated inverted ? Explain.
6. Explain the effect of source inductance in controlled rectifiers.
7. What is meant by commutation of SCRs ? What are the various types of commutation circuits ?
8. Explain the principle of PWM Inverters.
9. What are the various types of chopper circuits ?
10. List the advantages and applications of cyclo converters.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Compare the modern semiconductor devices like SCRs, power transistors, MOSFETs and IGBTs with reference to this characteristics, power ratings, turn on and turn off, switching frequency and applications.

Or

12. (i) Explain the two transistor analogy of SCRs.

    (ii) Explain the turn on and turn off of a GTO and its applications.

Turn over

13. (i) Discuss the ratings and specifications of SCRs.

(ii) The specfication sheet for an SCR gives maximum r.m.s. on state current as 50 A. If this SCR is used in a resistive circuit, compute its average on state current rating for conduction angles of 180°, 90° and 30° for half sinusoidal waves.

Or

14. (i) Draw and explain an RC triggering circuit for SCR.

(ii) What are the advantages of UJT triggering ? Explain the principle and operation of UJT triggering circuit.

15. With neat circuit diagrams and necessary waveforms explain the operation of single-phase fully controlled rectifier with RL load. Obtain the expression for output voltage and current.

Or

16. (i) A single-phase full wave bridge converter is connected to a 20 Ω resistive load. Estimate the average load voltage and current for a triggering angle of 30° if the supply voltage is 230 V at 50 Hz.

(ii) Explain a 3-phase half wave controlled rectifier.

17. (i) Draw a Resonant pulse commutation circuit and explain its operation.

(ii) Discuss the operation of a series inverter.

Or

18. Explain with a neat diagram and waveforms the operator of a MC Murry inverter.

19. (i) What are the various control strategies in a chopper circuit ?

(ii) Explain the operation of a two Quadrant chopper with a neat diagram

Or

20. (i) Explain with block schematic a Digital firing scheme for power converters.

(ii) Discuss the selection of firing circuits for a particular application.

(5 × 12 = 60 marks)

G 2128 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branches : Civil/Mechanical/Electrical and Electronics/Electronics and Communication/Polymer/Applied Electronics and Instrumentation/ Electronics and Instrumentation/Automobile

ENGINEERING MATHEMATICS—IV (CMELPASU)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours Maximum : 100 Marks

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

Module I

I. (a) State and prove Cauchy's integral formula.

(b) Evaluate $\int_C \left[\frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2 (z+2)}\right] dz$ where C is the circle $|z| = 3$.

Or

II. (a) Find the Laurent's series expansion of $f(z) = \left(z^2 - 1\right) \Big/ \left(z^2 + 5z + 6\right)$ in the regions :

(i) $|z| < 2$;

(ii) $2 < |z| < 3$; and

(iii) $|z| > 3$.

(b) Evaluate $\int_0^\infty dx \Big/ \left(x^2 + a^2\right)\left(x^2 + b^2\right)$.

Module II

III. (a) Using Newton's method find the root of $xe^x - \cos x = 0$ correct to four decimal places.

(b) Solve correct to four places of decimals by Jacobi's method :

$x + y + 54z = 110,\ 27x + 6y - z = 85,\ 6x + 15y + 2z = 72.$

Or

IV. (a) Using Regula Falsi medo solve correct to four decimal places $\cos x - 3x + 1 = 0$.

(b) Using Gauss-Seidel method solve correct to four places of decimals :

$8x - y + z = 18,\ 2x + 5y - 2z = 3,\ x + y - 3z = -6.$

Module III

V. (a) Using Taylor series method compute $y(0.1)$ and $y\ (0.2)$ correct to three decimal places where

$\frac{dy}{dx} = x + y^2,\ y(0) = 1.$

(b) Use Runge Kutta method to solve $10y^1 = x^2 + y^2,\ y(0) = 1$ for the interval $0 < x \leq 0.2$ with $h = 0.1$.

Or

VI. (a) Given $\frac{dy}{dx} = (y - x)/(y + x)$ with $y = 1$ for $x = 0$. Using Euler's method find y approximately for $x = 0.1$ in five steps.

(b) Compute $y(1)$ and $y\ (1.25)$ correct to four places of decimals, using Milne's predictor corrector method where $dy/dx = x^2 - y^3$, $y(0) = 1$, $y(0.25) = 0.821$, $y(0.5) = 0.7412$ and $y(0.75) = 0.741$.

Module IV

VII. (a) Evaluate the following :—

(i) $z\{\sin(3x + 5)\}$.

(ii) $z\{e^t \sin 2t\}$.

(iii) $z\{2(3^n) - 3(-1)^n\}$.

(b) Find $z^{-1}\left\{\left(3z^2 - 18z + 26\right)/(z - 2)(z - 3)(z - 4)\right\}$.

Or

VIII. (a) Use convolution theorem to evaluate $z^{-1}\left\{\left(z/z^{-1}\right)^3\right\}$.

(b) Using Z transform solve :

$u_{n+2} + 4u_{n+1} + 3u_n = 3^n$ with $u_0 = 0$ and $u_1 = 1$.

Module V

IX. (a) Solve the following linear programming problem by Simplex method :—

Minimize $Z = x_1 - 3x_2 + 2x_3$

subject to $3x_1 - x_2 + 3x_3 \leq 7$

$-2x_1 + 4x_2 \leq 12$

$-4x_1 + 3x_2 + 8x_3 \leq 10$,

$x_1,\ x_2,\ x_3 \geq 0.$

(b) Use two phase method to solve :

Maximize $Z = 2x_1 + x_2 + 3x_3$ such that

$x_1 + x_2 + 2x_3 \leq 5$

$2x_1 + 3x_2 + 4x_3 = 12$

$x_1, x_2, x_3 \geq 0.$

Or

X. (a) Apply the principle of duality to solve :

Minimize $Z = 4x_1 + 2x_2$ such that :

$x_1 + 2x_2 \geq 2$

$3x_1 + x_2 \geq 3$

$4x_1 + 3x_2 \geq 6$

$x_1, x_2 \geq 0.$

(b) Solve the following transportation problem :—

	D_1	D_2	D_3	Supply
O_1	2	7	4	5
O_2	3	3	1	8
O_3	5	4	7	7
O_4	1	6	2	14
Demand	7	9	18	34

G 2151

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Electrical and Electronics Engineering

INDUSTRIAL MANAGEMENT AND ECONOMICS (E)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Answer Part A and Part B in **separate** *answer books.*

All questions carry equal marks.

Part A (Industrial Management)

1. (a) Briefly explain the different functions of management.

   (b) What are the features of good organisational structure ?

Or

2. (a) Write short note on management by objectives.

   (b) Enumerate the functions of communication in management of an organisation.

3. (a) How do quality circle help in keeping quality of products in an organisation ?

   (b) List out the need for employee training in an organisation.

Or

4. (a) What are the objectives of personnel management ?

   (b) What are the basic functions of a trade union ?

5. (a) What are the formalities involved in setting up a partnership concern ?

   (b) Distinguish between joint sector and co-operative sector concern.

Or

6. (a) Discuss the factors that affect pricing of a product.

   (b) Explain how Economic order quantity helps in lowering the cost of inventory.

Part B (Engineering Economics)

7. (a) Define the term supply and enumerate the function influencing supply.

   (b) Define national income. What are the methods for computing rational income ?

Or

Turn over

8. (a) What is a tax ? Enumerate the differences between direct and indirect taxes with examples.

   (b) Describe the causes and consequences of inflation.

9. (a) Write short notes on :

   (i) IDBI.

   (ii) SIDBI.

   (b) Explain the contributions of NABARD in development of our nation.

Or

10. (a) What are the impacts of multinational companies in Indian economy ?

   (b) Enumerate the functions of RBI.

11. (a) Enumerate the functions of stock market.

   (b) What are the contributions of public sector companies in India ?

Or

12. (a) What causes black money and what are its consequences ?

   (b) Based on a given market conditions, explain how pricing of a product is done.

G 2142 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Fifth Semester

Branch—Electrical and Electronics Engineering

COMMUNICATION ENGINEERING (E)

(Supplementary—Prior to 2007 Admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Explain the need for modulation.
2. What are the advantages and disadvantages of single side band modulation ?
3. Compare the characteristics of FET and BJT modulators.
4. What is IF ? Why IF is needed in communication systems ?
5. Explain positive and negative modulations.
6. What is VSB transmission ? What are its advantages ?
7. What are the basic functions of radar ?
8. What are the advantages and disadvantages of continuous wave radar ?
9. Differentiate between geosynchronous and geostationary satellites.
10. Define space diversity and explain its uses.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) A signal $10 \sin (2 \times 10^4 \pi t)$ is modulated by the signal $\left[2 \sin \left(10^3 \pi t\right) + 1.5 \sin \left(1.5 \times 10^3 \pi t\right) \right]$. Derive an expression for the AM signal. Draw the spectrum and calculate the power on each component.

Or

(b) Derive an expression for an FM signal. Comment on the spectrum of the modulated signal.

Turn over

12. (a) Explain with a diagram the working of an AM transmitter.

Or

(b) Explain with a block diagram the principle of a superheterodyne receiver.

13. (a) Draw and explain the block diagram of a monochrome TV receiver.

Or

(b) Explain the basics of colour TV transmission.

14. (a) Derive the radar range equation. Explain the parameters that affect the range of a radar.

Or

(b) Explain with block diagram the priniciple of ILS.

15. (a) Write a brief account on the satellites used for communication purposes.

Or

(b) Discuss the basic principles of FDMA and TDMA.

(5 × 12 = 60 marks)