F 3521 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch—Electrical and Electronics

DIGITAL CIRCUITS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. With suitable examples, explain the floating point representation of numbers.
2. State and explain the De Morgan's theorem.
3. What is meant by min term ? Given the logical function of three variables $f(A, B, C) = A + \bar{B}C$. What are the min terms ?
4. Explain the terms fan-in and fan-out.
5. What is meant by Current sinking ? Explain.
6. Compare CMOS and TTI families.
7. Distinguish between sequential and combinational currents.
8. What is meant by shift register ? What are the difference types of shift registers ?
9. What is meant by twisted ring counter ? Explain.
10. Explain the methods to improve counter speed.

(10 × 4 = 40 marks)

Part B

11. (a) Realize exclusive OR operation using NAND and NOR gates.

    (b) Use K-map to minimize the function and realize at using logic gates :

    $f(A, B, C, D) = \pi m\,(0, 3, 4, 5, 6, 7, 11, 13, 14, 15)$

(12 marks)

Or

12. Realize Half adder and full adder using NAND gates. (12 marks)

Turn over

13. (a) Find the standard product of sums for the logic expression :

$$f(A, B, C, D) = AB + \bar{A}C\bar{D}E + \bar{B}CD$$

(b) Use K-map to minimize the expression :

$$f(A, B, C, D) = \Sigma m(0, 1, 2, 3, 4, 9, 10, 12, 13, 14, 15).$$

(12 marks)

Or

14. (a) What is meant by multi emitter transistor. How it is fabricated ?

(b) What is meant by active pull-up ? Explain.

(c) What is meant by totem-pole par ? Explain.

(12 marks)

15. Draw a neat diagram of TTL NAND gate and explain its operation. What is meant by sourcing and sinking ?

(12 marks)

Or

16. Explain the operation of SR flip-flop JK flip-flop, D and T flip-flops with their waveforms.

(12 marks)

17. Explain the operation of a Master slave JK flip-flop. What is meant by rare condition ?

(12 marks)

Or

18. Explain the operation of mod-N ripple connter using clear and preset inputs. (12 marks)

19. Explain with circuits and diagrams the SISO, SIPO, PIPO and PISO operation of 4 bit shift register.

(12 marks)

Or

20. Design a Universal shift register using R-S flip-flop. (12 marks)

[5 × 12 = 60 marks]

F 3530 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch : Electrical and Electronics Engineering

COMMUNICATION ENGINEERING (E)

(Regular / Improvement / Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Why modulation is required for signal transmission?
2. Discuss about the band width requirement for FM transmission.
3. Differentiate between high level modulation and low level modulation for AM transmitters.
4. In a superheterodyne AM receiver, define (a) image frequency (b) double spotting.
5. Differentiate between single side band (SSB) modulation and vestigial side band (VSB) modulation.
6. What is colour sub-carrier in a colour television system? Compare the bandwidth of color television signal and black and white television signal.
7. What is meant by range ambiguity in a pulsed radar? What is its relation with pulse repetition frequency.
8. Explain the instrument landing system (ILS) used for navigation.
9. What are the components of a satellite transponder?
10. Explain the FDMA system used in satellite communication.

(10 × 4 = 40 marks)

Part B

Each quesiton carries 12 *marks.*

11. In an amplitude modulation system, the carrier frequency is 455 Mhz and the modulating signal is band limited to 8 kHz. What is the bandwidth and the frequency range of the modulated signal? If the carrier power is 10 KW, what should be the modulation signal power to obtain a modulation index of 0.8 ? (12 marks)

Or

Turn over

12. Define modulation index for frequency modulated signal. In an FM system, if the modulation index is doubled, what will be the effect on total power and spectrum of the modulated signal? (12 marks)

13. With neat block diagram, explain the working of AM transmitter. (12 marks)

Or

14. With neat block diagram, explain the working of an FM transmitter. (12 marks)

15. (a) Compute the bandwidth required for television signal transmission.

(b) Explain the modulation scheme used for video signal transmission of television signals. (6 + 6 = 12 marks)

Or

16. (a) Discuss the methods for colour signal representation in television systems.

(b) Explain the need for horizontal synchronization pulse in the composite video signal and describe the components of the horizontal synchronization pulse. (6 + 6 = 12 marks)

17. Derive RADAR range equation. Define the terms used in the range equation. (12 marks)

Or

18. Explain the working of Continuous Wave (CW) RADAR. (12 marks)

19. Derive equivalent Isotropic Radiated power (EIRP) equations for satellite uplink and downlink. (12 marks)

Or

20. Write short notes on :–

(a) Geostationary orbit.

(b) Antenna look angles.

(c) Orbit Stabilization. (3 × 4 = 12 marks)

(5 × 12 = 60 marks)

F 3516 **(Pages : 3)** **Reg. No.** EEE

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 3539 (Pages : 2) Reg. No.....

Name .....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch : Electrical and Electronics Engineering

INDUSTRIAL MANAGEMENT AND ECONOMICS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *the questions.*
Answer Part A and Part B in **separate** *answer books.*
All questions carry equal marks.

Part A (Industrial Management)

1. (a) Explain the functions of Management.

   (b) Explain the key benefits of Motivating Employees.

Or

2. (a) With the block diagram explain about the organizational structures.

   (b) List out the objectives of any management.

3. (a) Explain any *two* Trade Unions in India.

   (b) Explain the resolution modes of Industrial disputes.

Or

4. (a) Name various forms of co-operative enterprises. List the merits and demerits of it.

   (b) What are the objectives of labour welfare and classify its methods.

5. (a) What are the objectives of Labour Welfare ? Classify welfare methods commonly used.

   (b) Explain about the Industrial disputes with some suitable examples.

Or

6. (a) Discuss in detail about Market Research and Advertising.

   (b) Write a short technical note on EOQ and CPM.

Part B (Engineering Economics)

7. (a) Explain the pricing mechanisms in Indian Market.

   (b) Define National Income. List out the methods of estimation of National Income.

Or

8. (a) What are the principles of taxation ? Why it is required ?

   (b) Explain in detail about the inflation and block money.

Turn over

9. (a) Briefly explain about the Indian Financial System.

   (b) Explain the functions of Commercial Banking System.

Or

10. (a) Compare the SIDBI and NABARD.

   (b) Explain the Insurance policies of UTI Banking System.

11. (a) What are the objectives of the monetary policy in India ?

   (b) Write a note on specific and valorem taxes.

Or

12. (a) What is money market and explain its functions.

   (b) Explain the multinature corporations function and their impact on the Indian Economy.

F 3549 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch—Electrical Engineering

LINEAR INTEGRATED CIRCUITS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Explain the characteristics of an ideal Op-amp.
2. Define and explain CMRR.
3. What is Duty cycle ? Explain its significance.
4. Explain the potential applications of sample and hold circuits.
5. List and explain the Ideal filter characteristics.
6. Differentiate DAC from ADL.
7. Explain the applications of PLL.
8. Explain the basic principles of PLC with a neat diagram.
9. Draw the schematic of 555 timer and explain it.
10. Explain the features of IC voltage regulator.

(10 × 4 = 40 marks)

Part B

11. Draw a neat block diagram of a typical Op-amp and explain in detail.

Or

12. Explain the following applications of Op-amp :—
    (a) Summing and scaling amplifier.
    (b) Log amplifier.
    (c) Voltage follower.

(6 + 6 = 12 marks)

Turn over

13. Draw a neat diagram of Op-amp Schmitt trigger and explain its principle.

Or

14. Draw Op-amp sample and hold circuit. Explain its principle in detail.

15. Explain the design steps of BPF and BRF with examples.

Or

16. Draw a neat Sketch of Dual-slope Op-amp converter and explain its principle in detail.

17. Draw a neat block diagram of PLL and explain its functioning in detail.

Or

18. Explain the applications of PLL as :

    (a) Frequency multiplier. (6 marks)

    (b) AM Demoudulator. (6 marks)

19. Explain the astable and monostable – Operations of 555 timer with neat diagrams.

Or

20. Write technical notes on :

    (a) 723 general purpose switching Regulator. (6 marks)

    (b) Zener voltage regulator. (6 marks)

[5 × 12 = 60 marks]

F 3556 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Fifth Semester

Branch : Electrical and Electronics Engineering

POWER ELECTRONICS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What are the features of power semiconductor devices ? Explain their applications.
2. Explain about EMI and RFI.
3. State and explain free. Wheeling effect.
4. Draw the block schematic of TI 494 and explain.
5. What are 3ϕ controllers ? Explain with examples.
6. Differentiate voltage converter from Inverter.
7. Explain the classification of choppers.
8. Explain the operation of step down converters.
9. Give an account on VSI and CST.
10. Explain the significance of PWM in converters.

(10 × 4 = 40 marks)

Part B

11. Explain the construction and principle of MOSFET and 1GBT with neat sketches.

Or

12. Explain the series and parallel operations of SCR with neat diagrams.
13. Explain the power factor improvement methods for phase controlled rectifiers.

Or

14. Explain the block schematic of SG 3524 in detail.

Turn over

15. Derive the expression for average value of thyristor current in a single-phase a.c. controller with R load.

Or

16. Explain different circuit configurations of 3ϕ a.c. controller with wave forms.

17. Derive the design equations of a current commutated D.C chopper.

Or

18. Explain in detail the four Quadrant converter operation.

19. Explain various PWM techniques in detail.

Or

20. Draw a neat circuit diagram of a single-phase bridge Inverter and explain in detail.

(5 × 12 = 60 marks)